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IP Protection and Ownership in Cross-Border Acquisitions

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Abstract

We use the institutional theory to examine the impact of intellectual property protection on US multinational corporations (MNCs) ownership levels of their foreign acquisitions. Based on a sample of 7,238 completed international M&A deals made by US MNCs from 1998 to 2017, we found that multinationals protect their intellectual property through more ownership when they are technologically intensive and invest more when IP protection is strong. However, IP protection negatively moderates the need for more ownership for technologically-intensive multinational corporations. Our results are robust to a battery of empirical tests, including a unique instrumental variable approach. This leads us to claim that our results are not merely correlated but are causal.

Keywords: IP protection, Institutional Theory, M&A, Technological intensity

Introduction

International acquisitions are a vital strategy for MNCs (Contractor et al., 2014; Angwin & Meadows, 2015). Pursuing international acquisitions includes gaining synergy benefits, facilitating portfolio diversification, accessing technological assets, and reducing taxation (Arslan, Tarba, & Larimo, 2015; Junni et al., 2015). The frequency and scale of international acquisitions have significantly increased during the past two decades (Cooke et al., 2021; Weber, Tarba, & Öberg, 2014). For instance, in 2018, more than 49,000 deals totaled $3.8 trillion in value (IMAA, 2021). Due to the global prevalence of international acquisitions, a better understanding of decisions about such acquisitions is important for international business (IB) scholars (Ahammad et al., 2017). Investigating whether and how firms' strategic orientations at the business level influence the entry mode choices by the US firms, Liang et al. (2009) showed that Prospectors are more likely - than Defenders - to select equity-based foreign market entry modes and that they prefer full-ownership entry modes (greenfield investments and full acquisitions) over shared-ownership modes (as joint ventures and partial acquisitions). In addition, exploring the Japanese ownership-based entry modes in Europe, prior research indicated that acquisitions posted poorer performance compared to greenfield wholly-owned subsidiaries and joint ventures (Nitsch, Beamish, & Makino, 1996). Examining the sources of value creation in cross-border acquisitions, Seth et al. (2002) identified several sources for synergy creation in cross-border acquisitions: asset sharing, reverse internalization of valuable intangible assets, and financial diversification. Extending this line of added value creation in M&A, the study by Parente et al. (2020) revealed that acquiring firms with greater innovative capabilities are likely to select target firms in nations characterized by less regulative distance from their home market.

As emphasized by Cuyper et al. (2015), linguistic and cultural distance reduce the impact of the combined lingua franca proficiency of the parties on the level of equity taken, which

demonstrates that the effective use of a lingua franca is impacted by the native tongues and cultures of the firms involved in the acquisitions. Ellis et al. (2018) found that equity ownership that foreign acquirers hold in African target firms is lower when colonial ties and greater differences in uncertainty avoidance exist between the acquirer's home country and the target African country. Yet, as highlighted by Yoon et al. (2021), when weak economic, political, and military relationships exist between acquiring and target countries, emerging market firms (EMFs) prefer to opt for full acquisitions.

The importance of obtaining the much-needed technological capabilities and organizational learning during cross-border mergers and acquisitions has been highlighted in prior research studies (Fu, Sun, & Ghauri, 2018; Park & Ghauri, 2011; Zou & Ghauri, 2008). When multinational corporations (MNCs) acquire foreign target firms, they tend to face significant challenges due to differences in cultures (Dikova & Sahib, 2013) and institutional environments (Dikova, Sahib & Witteloostuijn, 2010).

In this context, we contend that equity ownership in international acquisitions is an aspect that can help align the goals of MNCs and the target firm they are seeking to acquire and reduce the difficulties associated with post-acquisition management. This is especially the case when both the acquired and acquirer firms see the ownership structure as a mechanism for reducing the uncertainties associated with the external environment (Ahammad et al., 2017). One example of these uncertainties is the weak protection of intellectual property (IP) rights. Therefore, from the standpoint of the multinationals (MNEs), the role of the institutions in intellectual property rights (IPR) protection in the target countries and the underlying micro- and macro-processes shaping the evolution of the institutions becomes of critical importance (Prud'homme, Tong, & Han, 2021).

Technology-based firms tend to diversify technology through acquisitions to increase their proprietary know-how (Buckley & Casson, 2019a). Given the importance of proprietary knowledge and IP protection for the multinational firm, location-specific factors that protect such knowledge may also profoundly affect the firm's acquisition decisions regarding the ownership level in the target company.-Thus, our research question is: how does the level of IP protection in the host country affect the level of ownership for technologically intensive and non-technologically intensive firms?

Using the institutional theory (North, 1990), we focus on explaining the level of ownership sought in foreign acquisitions. The New institutional economics theory (North, 1990:3) defines institutions as "the rules of the game in a society or more formally . . . the humanly devised constraints that shape human interaction." We also recognize the interaction of the institutions with the characteristic of a specific firm leads to different outcomes (Young, & Marais, 2012). We examine the impact of intellectual property protection in the host country (formal institution), the technological intensity of the MNC, and their interaction.

The sample of 7,238 international M&A deals across 74 industries in 33 host countries for the empirical analyses is mainly obtained from Thompson's S.D.C. database, combined with host-country-specific information including, but not limited to, the international patent systems strength index developed and updated by Papageorgiadis and Sofka (2020). First, we document robust evidence supporting that a strong IP institution in a host country encourages US MNCs to increase their equity ownership in a target foreign firm. We also find that US MNCs tend to make more equity investments in international acquisition when they are technology-intensive. Lastly, we find that the observed positive effect of the technology intensity of US MNCs on international equity investment is moderated negatively when their target foreign firms operate in host countries with

stronger IP institutions. Those results are robust not only to a battery of robustness tests but also to a series of endogeneity tests, including the instrumental variable approach and the Heckman selection model.

Our paper makes a few contributions. First, we contribute to the literature on international mergers and acquisitions by confirming that foreign direct investment in high-technology products prefers intellectual property protection but that improvements in such protection will ironically lead to a decrease in the acquisition level of high-tech firms. We theorize and show that there is a negative interaction between IP protection and technological intensity that moderates the relationship between high-tech investment and ownership in international mergers and acquisitions. As we argue in the literature review section, there is tension in the expected direction of the moderating impact.

Second, prior literature on the share of equity sought in acquisition used the institutional theory as a theoretical lens and generated two streams of research, i.e., institutional distance (e.g., Williams and Vrabie, 2018; Delios & Beamish 1999; Dikova & Van Witteloostuijn 2007) and institutional quality (e.g., Ando 2012; Elango et al. 2013) in the host or home country. Institutional distance received more attention than institutional quality in explaining the ownership decision in international mergers and acquisitions. For instance, Kedia and Bilgili (2015), Elango, Lahiri, and Kundu (2013), Ilhan-Nas, et al. (2018), Contractor et al. (2014), and Chikhouni, Edwards, and Farashahi (2017) focused on the institutional distance to examine the share of equity sought in international mergers and acquisitions (Choi, Lee, & Shoham, 2016). As emphasized by Falaster, Ferreira, and Li (2021), when the acquirer faces a higher level of host-country arbitrary institutional inefficiencies, he tends acquirer tends to take higher ownership in a CBA. Moreover, recently the study by Krug and Falaster (2022) provided corroborative evidence to the notion that

the quality of the home country's institutional environment positively moderates the impact of the host country's environment over ownership choice in the acquisition. Focusing on institutional theory's institutional quality aspect, we postulate that countries with strong IP protection will attract higher ownership. Thus, we contribute to a small (e.g., Williams & Vrabie, 2018) but growing literature on institutional quality in explaining the ownership choices in international mergers and acquisitions.

Third, we empirically show and justify theoretically the interaction impact of host country institutions' quality and industry characteristics on the level of equity holding in the target company. Looking at the IP protection in the home country and moderating its impact on ownership level in an international acquisition by looking at technology intensity is unique in the current literature. Especially since our empirical analysis goes beyond regression analysis that merely provides correlation and moves into the causality support stage.

In the next section, we present the theoretical underpinning of our study, review the extant literature, and develop our three hypotheses. We then discuss the methodology we used to test these hypotheses, detail the results, and discuss their impact, ending with a conclusion.

Literature review and hypotheses

The decisions made by MNCs when expanding overseas are critical because of their ramifications for the firm’s performance. There is a significant body of empirical research in the international business (IB) and management literature focusing on an MNC’s decision-making in relation to location choice, entry mode choice, equity ownership level, and so forth. While prior studies have enriched and extended our understanding of ‘location choice’ and ‘entry mode choice’ for international entry decisions (Brouthers & Hennart 2007; Kim & Aguilera 2016; Morschett et al.

2010), the determinants that impact an MNC's decisions on equity ownership level have received less attention. Equity ownership stake represents an MNC's commitment and varies on a continuum from minority to majority and even to full equity ownership. The literature argues that equity ownership stake for MNCs is a key strategic decision (Anderson & Gatignon, 1986; Chari & Chang, 2009) involving a trade-off between relative costs (e.g., commitment of resources, risks in the foreign market) and benefits (e.g., degree of control in the foreign subsidiary).

Institutional theory and Intellectual Property Rights in M&A

The institutional perspective is based on the premise that institutions shape the formal and informal rules operating in society, thereby providing the structure for economic exchanges and affecting the costs of doing business (North 1990). Through the lens of the institutional perspective, the extant literature on equity ownership decisions has evolved into two streams: the first investigating the impact of institutional quality in the host or home country (e.g., Ahammad et al. 2018; Delios & Beamish 1999; Dikova & Van Witteloostuijn 2007) and the second focusing on the role of cross-national distances reflecting dissimilarities between home and host countries' formal and informal institutions (e.g., Ando 2012; Elango et al. 2013; Choi et al., 2016).

According to the first stream, a country with a weak institutional environment is subject to investment hazards due to poor contracting rights and intellectual property (IP) rights. Thus firms from developed countries prefer to opt for a higher equity ownership share in such foreign subsidiaries to circumvent the risk of asset appropriation. On the contrary, firms are less likely to opt for a higher equity ownership position when the host country has strong patent protection (Delios & Beamish 1999; Elango & Chen 2012). Alternatively, the superior technical know-how of the target firm may lead to a power imbalance and a clash of innovation cultures between the acquirer and the target firm, which increases the acquirer's integration costs after cross-border

acquisition. For example, emerging-market MNCs opt for full acquisitions rather than partial acquisitions when acquiring an R&D-intensive firm in a country with strong IP protection (Ahammad et al., 2018). However, technology-intensive foreign MNCs opt for a lower equity ownership stake in an IJV when the host country has greater innovation output (Williams & Vrabie 2018). Host-country institutional support in terms of easy access to capital and stronger export capabilities in the host country increases the firm's risk-taking propensity and thus facilitates a firm opting for a higher level of equity ownership (Pan 2002; Pinto et al. 2017).

As Papageorgiadis and McDonald (2019) underscored, while international IP systems changed radically after the enactment of the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement, existing international management research has not yet accounted for this change entirely. In the particular context of M&A transactions, Tovstiga and Farhadi (2010) proposed at the time that due diligence regarding IP and an integration roadmap have to be an integral part of the M&A process. Grimpe and Hussinger (2014) pointed to the fact that little is still known about the value that patents associated with a target's knowledge convey to the acquirer. They maintained that such property rights have preemptive power, allowing firms to create added value by pooling together such complementary competencies. According to Alimov and Officer (2017), acquirers are concerned about the local protection of intellectual capital when considering foreign M&As only in more intellectual capital-intensive industries and when the target country has weaker intellectual property rights protection than the acquirers' countries. They also underscored those synergistic gains in cross-border M&As are positively associated with reforms in intellectual property rights (Alimov & Officer, 2017). In this vein, a recent study revealed that the protection of IP rights and their enforcement impact decisions about cross-border M&As in all sectors regardless of their technological content. However, such protection is more important in

countries that excel at imitation and in the high-tech sector. These findings may explain why better IP rights protection and enforcement are likely to increase M&As in developing nations rather than in developed countries (Campi, Dueñas, Barigozzi, & Fagiolo, 2019).

Development of Hypotheses

a) Strength of IP protection and international acquisition

A country's institutional environment consists of informal institutions such as norms, customs, and culture and formal institutions such as rules, regulations, and IP rights (North, 1990). According to Institutional theory, an institutional environment that has well-functioning formal and informal institutions promotes the efficient functioning of markets. However, poorly functioning formal and informal institutional mechanisms create uncertainty for those engaged in transactions. In the context of the institutional environment, Ahammad et al. (2018) suggested that strong IP institutions reduce this uncertainty, provide efficient protection for IP owners and protect against IP thieves. Consequently, strong IP institutions reduce uncertainty, support R&D investments, and encourage firms to seek a full acquisition.

Firms assess the strength of the IP institutional conditions of the country where they operate and modify the level of control that they need to exercise over their R&D investments, the boundaries of their firm, as well as decisions related to developing and employing complementary assets to exert control over the appropriation of their innovations (Pisano, 2006; Teece, 2007). Operating in countries boasting strong IP institutions is desirable for MNCs because strong IP institutions decrease uncertainty, provide protection, and enable firms to exploit their investments in R&D more efficiently by blocking potential imitators (Teece, 1986). Strong IP institutions also enable the efficient identification of potential IP infringements in a clear, orderly, and relatively (too weak IP systems) low-cost way. This allows IP-owning firms to realize and appropriate the

maximum value of their innovation through internal or external IP exploitation. More importantly, firms that have established a strong R&D and innovation position will be better placed to defend the rights accruing from their innovations via litigation or out-of-court settlement (James et al., 2013). The potential or actual enforceability of R&D investments and IP assets in a strong and efficient IP system provides certainty to investors and can lead to higher commercialization values (Gans et al., 2008). Therefore, operating in strong IP institutions can allow firms to achieve stronger R&D performance and higher returns on their R&D investments.

Institutional factors, however, are dynamic and affect the configuration of MNCs. Building on North (1990), Meyer (2001) argued that MNCs establish wholly-owned subsidiaries in countries making the most progress with institutional reform. In this case, the acquisition is expected in stable institutional environments that provide legal and political protection for such investments. We extend this argument by postulating that countries with strong IP protection will attract higher ownership acquisitions. Thus, we posit that:

H1:The host country's IP protection laws and enforcement positively impact the percentage of equity ownership acquired in the target firm.

b) Technological intensity and international acquisition

Market imperfections in knowledge transfer led to the internalization of foreign activities (Buckley & Casson, 1976). Knowledge can be transferred more effectively using hierarchical control instead of market mechanisms (Caves, 1996). Transaction costs are high for firms investing in technological knowledge because of market failures from the transfer of firm-specific knowledge to unrelated parties. MNCs that invest in creating firm-specific technology find it critical to internalize value-added activities abroad. Thus, technologically intensive firms tend to internalize technological knowledge, which allows them to embed their proprietary technologies into key

components and products produced by subsidiaries. Internalizing technological knowledge allows firms to protect firm-specific advantages (Teece, 1987). Therefore, firms operating in technologically intensive industries are more likely to internalize foreign activities than non-technologically intensive ones.

When acquisitions are made in technologically intensive industries, the target firms are more likely to possess proprietary technologies (Hennart & Park, 1993; Anand & Delios, 2002). Researchers have established that MNCs with a high level of R&D intensity are likely to export significant knowledge to international markets (e.g., Slangen & Hennart, 2007). Furthermore, MNCs operating in industries with a high R&D intensity are likely to transfer significant knowledge to their subsidiaries. However, if these subsidiaries result from the acquisition of local firms, foreign MNCs can find themselves facing management problems (Hennart & Park, 1993; Drogendigk & Slangen, 2006). Additional difficulties may include problems in pricing the technology and enforcing the contracts in the case of a joint establishment in the form of a partial acquisition used to enter a foreign market (Hennart, 1991).

Studies such as Padmanabhan and Cho (1996) have indicated that MNCs with high R&D expenses tend to prefer full ownership in order to completely control their proprietary know-how and exploit it in their international markets. We argue that technologically-intensive firms are more likely to internalize their foreign acquisitions in order to obtain more ownership and control of the technology-based assets. Doing so provides them with more resources and considerably more authority to make organizational changes in the best interests of the merged entity. Thus, we expect technologically intensive firms to pursue a higher level of equity acquisition or even full ownership than non-technologically intensive firms. Therefore, our second hypothesis predicts that:

Hypothesis 2: The technological intensity of the MNC positively impacts the percentage of equity ownership acquired in the target firm.

c) Moderating effect

Institutions are widely recognized in the literature as moderators for economic (Ghura, & Harraf, 2017) and financial (Islam, Khan, Popp, Sroka, & Oláh, 2020) outcomes. More specifically, IP institutions have been proven to moderate socioeconomic outcomes (Gamso, & Grosse, 2021); Hou, Tang, Zhang, Hong, & Wang, 2022). An interesting example of the moderating effect is the finding of Gamso & Grosse (2021) that preferential trade agreement depth is positively associated with FDI between member countries, but the afore-mentioned linkage becomes weaker as property rights laws in host countries increase in strength. Zahra and Bogner (2000) provide support that firm's Technology strategy is moderated by the external environment. Dikova and Van Witteloostuijn (2007) provide empirical support that the degree of the host country's institutional advancement moderates the technological intensity of the MNC on the establishment and entry mode choice.

Building on North (1990), Meyer (2001) postulated that firms would rather establish wholly-owned subsidiaries in countries with the most progress in institutional reform. While this contention is intuitive and has some empirical support (Jensen, 2008; Seyoum, 2009), Wu et al. (2012) made the counter-intuitive observation that sometimes, the most corrupt and poorly governed nations get most of the investment in the form of FDI, which is an expensive, high-risk mode of entry. According to the authors, the reason is that FDI provides the investor with an "insider" perspective on a poorly managed environment and direct control over operations, technology, and financials. The authors concluded that companies use FDI as a form of direct control and a substitute for the poor governance environment, given the lack of rules in emerging

markets. Leading us to conclude that IP protection will have a moderating effect in our case, but the exact direction is unclear.

Based on the above argument, hypothesize that:

Hypothesis 3: IP protection will moderate the relationship between technologically intensive investment and the percentage of equity ownership acquired in the target firm.

Description of the sample and data

Sample Selection

Our study initially obtained information about 9,028 completed international M&A deals made by US MNCs between 1998 and 2017[1] from Thompson's S.D.C. (SDC M&A) database. To measure the strength of formal institutions for protecting intellectual property (IP) in the host countries of the target firms, we used the updated international patent systems strength index developed and updated by Papageorgiadis and Sofka (2020). We also obtained country-level data that includes, but is not limited to, cultural variables from the GLOBE (House, Hanges, Javidan, Dorfman, & Gupta, 2004). Finally, we used the Compustat North America database to obtain firm-level accounting data capturing the technology intensity of US MNCs. This database provides fundamental and market information on public companies in the US and Canada. After screening and removing observations lacking key control variables of interest, such as those in the OECD FDI Restrictiveness Index, we were left with 7,238 international M&A deals[2] across 74 industries[3] in 33 host countries (See Table 1). The wide geographical coverage of the sample provided us with international data that was varied enough to examine the effect of the strength of institutions

[1] Our sample period starts in 1998 and ends in 2017 because the new Patent Enforcement Index (Papageorgiadis & Sofka, 2020) used to measure the strength of the IP protection of a host country in the study covers 20 years from 1998 to 2017 only.

[2] The actual sample used in each regression analysis that follows is different, because the data availability varies for each analysis.

[3] For a full list of 74 industries in the final sample, please refer to Panel A of Appendix 1.

protecting IP in host countries on the degree of equity ownership of the target firms in the host countries acquired by US MNCs at the firm level.

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Table 1 approximately here
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Dependent Variable

We used the percentage of equity ownership of target firms in host countries acquired by the US MNCs (hereinafter percentage acquired by US MNCs) in international M&As because they represent a major source of FDI[4].

Independent Variables

The primary independent variables of interest are the strength of the IP protection for hypothesis 1, technology intensity for hypothesis 2, and their interaction for hypothesis 3.

Strength of IP protection

To approximate the strength of the IP institutions of the host country of a target firm (IP institutions), we used the updated International Patent Enforcement Index (PEI) developed by Papageorgiadis and Sofka (2020). The index aims to capture the strength of a national patent system with a special emphasis on the effectiveness of enforcement practices for 51 countries between 1998 and 2017. The index goes beyond the measurement of the effects of the laws on the books regarding the patent system that Park's (2008) index uses. Instead, it focuses on the strength of enforcement-related aspects of national patent systems (Papageorgiadis et al., 2013, 2014; Papageorgiadis & Sharma, 2015).

[4] Based no an anonymous reviewer's comment that the OECD and IMF define investment with less than 10% of equity as portfolio investment rather than FDI, we re-tested all three hypotheses by focusing on a subsample of cross-border acquisitions which exceed a minimum threshold of 10% equity investment and found that our results continued to hold. Results are available upon request from the authors.

As Papageorgiadis et al. (2014) noted, the index of patent systems' strength "...places particular emphasis on the effectiveness of enforcement practices, together with the overall administrative functioning of the system as perceived by managers" (p. 586). This attribute of the index is important for this study because, according to Park's (2008) index, there is little variance between European countries in their patent laws on the books. In contrast, there are clear variations in the scores of European countries on Papageorgiadis et al.'s (2014) index of patent systems strength. In addition, the latest update of Park's (2008) index provides scores only for 2005, whereas the latest update of the Papageorgiadis and Sofka (2020) index provides annual scores for 1998–2017.

Technology Intensity

We primarily measured US MNCs' technology intensity using information from Compustat North America about their annual R&D investments, scaled by their total year-end assets (*R&D/Assets*). Given that many companies do not report any information on R&D in their financial statements because either these firms have no or limited R&D expenditures or choose not to disclose them for strategic reasons (Koh & Reeb, 2015), we also measured technology intensity based on the firms' industry as an alternative proxy for acquirers' technology intensity in robustness tests, which we will discuss later.

Control Variables

Host country-specific characteristics

We controlled for seven host country-specific characteristics that previous studies identified as affecting FDI. The first variable is obtained from FDI regulatory restrictiveness index for each country, industry, and year. This index was developed in 2003 by the OECD and measured the

degree of restrictiveness of the FDI policy by country.[5] For industry classification, given that the OECD uses sector classifications that are different from the industry sector classifications available from the SDC M&A database, we manually matched the OECD industry sectors with the industry sectors of the target companies in the SDC M&A dataset. For example, we manually assigned the OECD sector "Transport" to the "Air Transportation and Shipping" industry sector in the SDC M&A dataset. Specifically, we used *Restrictiveness Total Index* as a measure of FDI restriction by the host country. The *Restrictiveness Total Index* is obtained by adding the scores for all four types of FDI restrictiveness measures: (i) foreign equity restrictions, (ii) screening and prior approval requirements, (iii) rules for key personnel, and (iv) other restrictions on the operation of foreign enterprises, with the constraint that their sum is capped at a value of 1. As an alternative measure for FDI restriction by the host country, we also used *Restrictiveness Type 1 Index,* which refers to how foreign equity restrictions are imposed on industries in host countries each year.

We used the variable *same border* to designate the two countries (Canada & Mexico) that border the US (Ahern, Daminelli, & Fracassi, 2015) and that also are members of the North America Free Trade Association (NAFTA).

We added the host country's *sovereign credit rating* calculated by S&P Global Rating as a composite indicator of a host country's attractiveness for MNCs' FDI (*e.g.*, James & Vaaler, 2018). We measured the sovereign credit rating of each host country using entity ratings for long-term foreign currency-denominated debt issues available from Compustat Capital IQ. Following Klock,

[5] One issue is that the OECD data are available only for 13 years (1997, 2003, 2006, and 2010 to 2017), while our sample covers international M&A investments for 20 years from 1998 to 2017. To deal with this issue, we used the closest FDI restrictiveness index to fill in for missing years under the assumption that the FDI policies remained relatively stable. For example, we used the 2003 data to fill in missing data for 2000 to 2002 and used the 1997 data to fill in the two missing years of 1998 and 1999.

Mansi, and Maxwell (2005) and Pandej, Sirimon, Pornsit, and Lee (2020), we computed the credit ratings using a conversion process in which AAA-rated bonds were assigned a value of 22, and D-rated bonds were assigned a value of 1. Unrated firms were assigned the value of 0.

Another host country-specific control variable is *the Level of FDI inflow into the host country.* The literature (see Chari & Chang, 2009) recognizes the level of cross-border acquisition activity in the host country as one of the determinants of the share of equity investments in cross-border acquisitions. To account for the level of cross-border acquisition activity in each host country, we followed Chari and Chang (2009) and used the average percentage of worldwide FDI inflow to a host country in the last three years prior to the completion of each M&A deal that occurred in the host country.

We also included annual *GDP* in tens of millions of US dollars and *GDP per capita* in tens of thousands of dollars. We controlled for GDP and GDP per capital as proxies for the effect of economic masses (Siegel et al., 2011).

Host and home country distances.

We first controlled for two distance variables: cultural and geographic distance. Cultural distance has long been recognized as a major variable affecting FDI. To measure Cultural distance, we used the cultural variables from the GLOBE to make this assessment (House et al., 2004). Based on Shenkar's (2001) arguments against using aggregate dimensions for cultural distance, out of the nine GLOBE cultural variables, we used only two that Lubatkin, Calori, Very, and Veiga (1998) have proven to influence international M&A activity: uncertainty avoidance (UA) and future orientation (FO). Thus, in accordance with Chari and Chang (2009), we operationalized two measures of the cultural distance (*UA-Gap* and *FO-Gap*) between US MNCs and the target firms as follows. We first subtracted the value of each cultural variable of the host country of the target

firms from those of the US MNCs and then standardized the difference in value by dividing it by the variance of each cultural variable.

Buckley and Casson (1979) argued that geographical distance increases entry barriers, and Portes and Rey (2005) indicated that geographical distance increases information friction. We used the log of the minimum *geographical distance* between the capital cities of the US and the host country (Siegel et al., 2011).

Acquirer-specific characteristics.

In addition to these variables, we also controlled for acquirer-specific and target-specific characteristics to mitigate omitted variable bias and included them in all of the regression models. For acquirer-specific characteristics,[6] we constructed an indicator variable, *US MNC is public (Yes/No)* that takes the value of 1 if the US MNC is publicly listed and 0 otherwise. As previous studies have suggested (Kogut & Singh, 1998 and Chari & Chang, 2009), the prior presence of an acquirer in a host country can help reduce the information asymmetry that inevitably arises in international M&A transactions. To control for a US MNC's prior presence in a target firm's host country, we created a variable[7], the Number of prior equity investments made in local firms operating in a host country before it acquired any equity ownership of the target firm in the same host country. We adopted this approach based on the assumption that the MNC's presence in the host country makes it more familiar with the target firm, increasing its trust in the firm and the MNC's willingness to share information with it without fear of losing its intellectual property.

[6] Given that only about 63% of US MNCs in our sample are publicly traded firms, we decided not to use other firm-level data due to a significant reduction in the size of the sample in the regression analyses. When we included ROA, Leverage, Log(Total assets), and sales growth rate of US MNCs as additional acquirer-specific control variables in our robustness tests, our results continued to hold. Results are available upon request from the authors.

[7] When we controlled for US MNCs prior presence (Yes/No) in a host country which has a value of 1 if the US MNC had at least one equity investment in local firms operating in a host country prior to the current equity investment in the target firm in the same host country or 0 otherwise instead of using this number of prior equity investment variable, we found very similar results. Results are available upon request from the authors.

Target-specific characteristics

To assess the role of target firm-specific characteristics,[8] we first used a dummy variable, the *same industry*. If the two-digit SIC for US MNC and its target firms are the same, the value is 1, otherwise, 0. As a second target firm-specific measure, we added the target firm's size,[9] measured as the log of the market value of the target firm. Given that the market values of many target firms are not readily available, we followed Chari and Chang (2009) to estimate *Target firm market value* by dividing the value of the transaction by the percentage of equity acquired in each international M&A deal, as listed in the SDC M&A database. We used its log value to correct for potential skewness.

Deal-specific characteristics and industry and year fixed effects

For deal-specific characteristics, we created two indicator variables as follows. *Friendly Offer (Yes/No)* has a value of 1 if the offer was a friendly bid and 0 otherwise. *Tender Offer (Yes/No)* has a value of 1 if the offer was tendered publicly and 0 otherwise. Finally, we included *industry fixed effects* to control for industry-wide shocks to international M&A activities. Given that such activities may be related to the business cycle and other inter-temporal macroeconomic changes, including the global financial crisis in 2008, we included *year fixed effects* as well in all of the regression analyses to follow.

[8] When we also included a binary variable, "Target firm is public (Yes/No)," which has a value of 1 if the target firm in each deal is a public firm and 0 otherwise as an additional target-specific control variable in the analysis, the results remained robust. Results are available upon request from the authors.

[9] The target firm's size can also be a proxy for the total cost that the US MNC incurs to acquire the firm, given that a majority of international M&A deals in our sample are 100% full equity acquisitions. When we used total deal value as a proxy for the total acquisition costs of the US MNCs as a robustness check, our results continued to hold. Results are available upon request from the authors.

Descriptive Statistics

Panel A of Table 2 presents the descriptive statistics for the variables of interest in the study. Interestingly, the mean score of the IP institutions in our sample is 7.69, which is somewhat higher than the mean score of 6.3 of all of the countries in Papageorgiadis and Sofka (2020), suggesting that the US MNCs in our sample tend to selectively acquire target firms that are domiciled in host countries with strong patent systems in place. On average, the US MNCs in our sample invested 5% of their total assets in R&D over the sample period. Some of the statistics are also worth noting. The mean sovereign credit rating is 20.16, which corresponds to AA, implying that US MNCs tend to select host countries conservatively before deciding which local firms to acquire. However, the relative importance of host countries, measured in terms of the proportion of worldwide FDI inflow, is not significant, evidenced by the minimal level of local FDI inflow of 3.36% on average. Interestingly, the mean *number of prior equity investment of 0.87 suggests that most international M&A transactions during our sample period occurred in host countries where US MNCs had not established any presence there before the transaction.* Table 2 also lists the descriptive statistics for the other control variables used in our study.

The correlation matrix[10] in Panel B of Table 2 reports the correlations among our variables of interest. As hypothesized, the percentage of equity ownership of the target firms acquired by US MNCs is positively correlated with the *IP institutions* of the host countries where the target firms operate and with the *R&D/Assets* of the US MNCs. We also found the expected negative correlation between *each restrictiveness index* and US MNC investments. This result confirms that regulatory restrictions on the FDI policy in host countries hinder international equity investments

[10] Thanks to an anonymous reviewer's suggestion, we checked the Variance Inflation Factors (VIFs) of all explanatory variables and found that there is no significant multicollinearity issue which might affect the reliability of our results.

by US MNCs. As the positive correlations imply, US MNCs are likely to acquire more equity ownership of target firms domiciled in host countries with better *sovereign credit ratings* and greater *FDI inflow*. The proximity between the host and home countries, measured by geographical and cultural distance, seems to encourage more equity investments by US MNCs. The negative correlation between *geographical distance* and the *FO-Gap* with the percentage of equity ownership of target firms supports this finding. Interestingly, the insignificant correlation of the *number of prior equity investment* suggests that the US MNCs' prior international M&A experience in a host country does not act as a catalyst for subsequent engagement in future international M&A transactions in the host country.

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Empirical Model

To test our hypotheses, for our baseline empirical models, we used the multivariate ordinary linear squared (OLS) regression models specified in Equation (1) for hypothesis 1 and Equation (2) for hypothesis 2, respectively.

(1) $International\ M\&As = \alpha + \beta_1 * IP\ institutions + \beta_2\ Controls + Industry\ FE + Year\ FE + \varepsilon.$

(2) $International\ M\&As = \alpha + \beta_1 * R\&D/Assets + \beta_2\ Controls + Industry\ FE + Year\ FE + \varepsilon.$

We used the percentage of equity ownership the MNC purchased as the dependent variable. We also considered IP institutions in Equation (1) and R&D/Assets in Equation (2) as the focal explanatory variables of interest, along with the other control variables detailed above. Both equations include industry and year dummies to account for variations in international M&A activities by US MNCs over time and across industries. The standard errors are clustered at the US MNC acquirer level to control for possible correlations among international M&As made by the same acquirers during our sample period.

For robustness, given the skewed distribution of M&A data, we also use Tobit and ordered logit regressions. In addition, we use the Instrumental variable (IV) approach and Heckman sample selection model to mitigate endogeneity concerns.

RESULTS

Tests of Hypothesis 1: Effect of IP Protection Rights on Cross-Border M&A Deals

a. Baseline OLS regression

To test our first hypothesis, we first estimated Equation (1). As the results of the baseline OLS regression models in Table 3 show, IP institutions, which are designed to capture the degree of protection and enforcement of intellectual property rights in a host country, are associated with a significant increase in international M&A activities by US MNCs in the host country. This finding strongly supports hypothesis 1.

We estimated the economic magnitude of the index of the patent systems' strength as follows. The coefficient of the index in Model 1 in Table 3 is 1.042. Its standard deviation is 1.67 in Panel A of Table 2. Therefore, an increase in the IP institutions by one standard deviation raises the percentage of the firm acquired by US MNCs by (1.042) * 1.67%=1.74%. This result suggests that stronger IP institutions matter in international M&A transactions not only statistically but also economically. We found very similar results when we replaced the Restrictiveness Type 1 Index with the Restrictiveness Total Index in Model 2.

In response to possible concerns that our dependent variable is censored both to 0% and 100%, we re-estimated Equation (1) using Tobit regression models, where we restricted the values of our dependent variable to a lower limit at 0% and an upper limit at 100%. As Models 3 and 4 in Table 3, which report the results of the Tobit regression, indicate, the results remained robust.

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b. Robustness check: Ordered logit regression

Given that about 80% of our sample represents US MNCs' full acquisitions of equity ownership, we addressed our sample's skewness toward full acquisition by re-estimating Equation (1) using ordered logit regressions. We classified our dependent variable into three categories using this approach, assuming that these categories have ordering values, but the distances between adjacent categories vary. First, we assigned a value of 2 to instances when US MNCs purchase 100% of the equity ownership of the target firms (forming a wholly-owned subsidiary). Similarly, we assigned a value of 1 when US MNCs purchased more than 50% but less than 100% of the equity ownership (gaining a majority status) and 0 when US MNCs become minority equity investors by purchasing no more than 50%. Again, as reported in Models 1 and 2 of Table 4, the results remained robust.

We also classified the dependent variable into 11 categories with 10% increments, such as between 0 and 10%, between 90% and 100%, and exactly 100%. We then re-estimated the ordered logit regression models. As Models 3 and 4 of Table 4 indicate, we found very similar results. Combined together, the primary results for hypothesis 1 are robust to different model specifications.

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Table 4 approximately here

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To further address this sampling bias, we operationalized the dependent variable to create three additional binary variables as follows. The first binary variable is "*Full Acquisitions,*" which has a value of 1 if the percentage acquired by US MNCs is 100% and zero otherwise. The second

binary variable is "*Majority Acquisitions,*" which has a value of 1 if the percentage acquired by US MNCs is greater than 50% and zero otherwise. Lastly, we created one more binary variable, "*Super Majority Acquisitions,*" which has a value of 1 if the percentage acquired by US MNCs is above the super majority of 66.7% and zero otherwise. Then, we re-estimated Equation (1) using logit regression models where each of three binary variables (*Full Acquisitions, Majority Acquisitions*, and *Super Majority Acquisitions*) is used as a dependent variable respectively.

As reported in Models (1) and (2) of Appendix 3, where *Full Acquisitions* is used as a dependent variable, we continued to find IP institutions' positive and significant effects on international M&A deals. We also report the marginal effect for IP institutions, i.e., the change in the probability of US MNCs acquiring 100% of equity ownership of a target firm. As shown in Model (1), when IP institution increase by its standard deviation of 1.67 (reported in Panel A of Table 2), the probability that a target firm is fully acquired by a US MNC increases by 3.6%, which is not economically trivial.

However, when we replaced it with *Majority Acquisitions* as a dependent variable, the positive effect became insignificant In Models (3) and (4), which is quite expected because, as pointed out earlier, our sampling skewness is toward 100%. The full acquisition does not give us much variation in the value of the dependent variable. For your information, 6,617 (93%) of 7,114 observations used in Models (3) and (4) belong to *Majority Acquisitions*. Lastly, as reported in Models (5) and (6), with *Super Majority Acquisitions* being used as a dependent variable, we continued to find robust results supporting our prior findings.

Tests of Hypothesis 2: Effect of Technology Intensity on Cross-Border M&A Deals

Starting with our baseline OLS regression in Equation (2), we tested our second hypothesis. As Models 1 and 2 of Panel A of Table 5 indicate, the variable R&D/Assets, which captures the

technology intensity of the US MNCs, has significantly positive coefficients. This result suggests that these companies with large R&D investments tend to make more equity investments in their international acquisitions than their counterparties with limited R&D investments.[11] To assess the robustness of our findings, we re-estimated Equation (2) using ordered logit regressions, where we classified our dependent variable into three categories[12] as we did in Models 1 and 2 of Table 4. Models 3 and 4 in Panel A of Table 5 provide us with consistently robust results, implying that the results for our second hypothesis remain robust regardless of the model's specifications. Note that we had to reduce our sample size[13] by half to 3,288 from our initial sample of 7,238 observations because not all US MNCs are public companies[14] , and Compustat North America, from which we obtained our estimates of R&D/Assets, does not cover non-public companies in general. To cope with this substantial loss of observations in the analysis, as an alternative proxy for the technology intensity of the US MNCs, we re-estimated the technology intensity using the technology intensity of the US MNCs' industry. As the results that appear in Panel B of Appendix 1 indicate, we first followed the literature (Kile & Phillips, 2009; Bodt, Cousin, & Roll, 2018; Mescall & Klassen, 2018) to identify technology-intensive industries using the 3-digit SIC code. Using this information, we created a binary *High-tech (Yes/No)* variable, which equals 1 if the US MNC has one of the following primary 3-digit SIC codes: 283, 357, 366, 367, 382, 384, 481, 482, 489, 737

[11] Given that our dependent variable is censored both to 0% and 100%, we also re-estimated Equation (2) using a Tobit regression and found that our results were robust after controlling for the censoring of our dependent variables. Results are available upon request from the authors.

[12] Reclassification of the dependent variable into the same 11 categories as in Models 3 and 4 of Table 4 did not alter our primary findings. Results are available upon request from the authors.

[13] To cope with this sampling bias, we also followed customary practice (Lewis & Tan, 2016) and re-constructed the R&D/Assets by assigning a value of 0 to R&D expenditures if the data were missing. These robustness tests produced results that were very consistent with our previous findings. Results are available upon request from the authors.

[14] When we used R&D/Assets as an explanatory variable in Panel A, we intentionally dropped the variable of *US MNC is public (Yes/No)* as a control variable from the regression analysis because the data for R&D/Assets are available from Compustat North American only for public US MNCs.

and 873, and 0 otherwise. Based on the technology intensity of the industries of the US MNCs, we re-estimated Equation (2) using the OLS and ordered logit regression models. As the significantly positive coefficients of the results with regard to the binary *High-tech (Yes/No)* variable in Panel B of Table 5 indicate, US MNCs operating in industries with a high level of R&D intensity tend to y acquire more equity ownership of these foreign target firms than those in industries with a low level of R&D intensity. Conducting these additional tests using the industry-based technology intensity confirmed that our results are robust to an alternative definition of the technology intensity of US MNCs.

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Tests of Hypothesis 3: Moderating Role of IP Institutions

To test our third hypothesis, we first created a binary *High-IP (Yes/No)* variable, which equals 1 if the IP institutions of a host country are above the global median and 0 otherwise. We then interacted it with *R&D/Assets* to create the interaction term and included both *High-IP (Yes/No)* and the interaction term in Equation (3). The coefficient of the interaction term (β_3) is designed to capture the moderating role of the strength of IP institutions in the relationship between the technology intensity of US MNCs and international M&As.

(3) $$International\ M\&As = \alpha + \beta_1 * High\text{-}IP\ (Yes/No) + \beta_2 * R\&D/Assets + \beta_3 * High\text{-}IP * R\&D/Assets + \beta_4 * Controls + Industry\text{-}fixed\ effect + Year\text{-}fixed\ effects + \varepsilon.$$

As reported in Models 1 and 2 in Panel A of Table 6, *R&D/Assets* continues to exhibit the same significantly positive coefficients we already reported in Panel A of Table 5, reconfirming that US MNCs with a high level of R&D investment actively engage in acquiring more equity ownership of target firms than their counterparties with limited R&D investments. Interestingly,

as these models indicate, the interaction terms are significantly negative, suggesting that the positive effects of the technology intensity of US MNCs are moderated negatively when the target firms are operating in host countries with stronger IP institutions.

To assess our results' robustness, we re-estimated Equation (3) by interacting R&D/Assets with IP institutions instead of the binary *High-IP* variable. As reported in Models 3 and 4 in Panel B of Table 6, we once again found results consistent with our previous findings. While they support the moderating role of the IP institutions, they are weaker in statistical significance, at least partly due to the exclusion of many privately-held US MNCs from the analysis.

To mitigate the potential bias resulting from the significant loss of observations in the analysis, we again measured the technology intensity of the US MNCs using their industries, as we did in Panel B of Table 5. Specifically, we utilized a 2×2 classification where we interacted High-IP with High-tech (Yes/No) in lieu of *R&D/Assets* and re-estimated Equation (3).

As reported in Models 1 and 2 in Panel B of Table 6, the interaction terms continue to be significantly negative, suggesting that the positive effect of the US MNCs' technology intensity is less pronounced when the target firms operate in host countries with stronger IP institutions. We also found similar results in Models 3 and 4 in Panel B of Table 6, where we interacted High-tech (Yes/No) with IP institutions instead of the binary *High-IP* variable in Equation (5). Combined together, the results in Table 6 strongly support our third hypothesis that IP protection in the host countries of the target firms negatively moderates the positive effect of the US MNCs' technology intensity, regardless of whether that intensity is measured in terms of firm-level R&D investments or industry-level technology intensity.

For easier interpretation, we depicted the interaction effect using this 2×2 classification by plotting the predicted value of the percentage of equity ownership acquired by US MNCs for each

combination of *High-IP (Yes/No)* and *High-tech (Yes/No)*. As Figure 1 illustrates, the linear plots[15] for both *High IP* and *Low IP* are upward-sloping, confirming that US MNCs in high-tech industries tend to acquire more equity ownership of target firms in their international M&A transactions during our sample period compared to their counterparties in low-tech industries. As expected, the slope for *High IP* is less steep than and intersects with the one for *Low IP*. This result suggests that the positive effect of the technology intensity of the US MNCs on their acquisition of equity ownership becomes attenuated when the target firms operate in countries with strong local IP institutions rather than in countries with weak local IP institutions, corroborating the negative coefficient of the interaction term (β_3) in Models 1 and 2 in Panel B of Table 6.

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Exploring Endogeneity: Sample Selection Bias

Reverse causality does not appear likely in the present study because firm-level M&A activities are unlikely to affect IP institutions in the host country. However, as noted in prior work (Vasudeva, Nachum, & Say, 2018; Flores & Aguilera, 2007; Flores, Aguilera, Mahdian, & Vaaler, 2013), it is plausible that acquiring firms first choose the country before selecting target firms. If so, our empirical results may be subject to sample selection bias, a type of endogeneity problem.

To address this sample selection bias, we follow the empirical methodologies used in those prior studies and estimate Heckman's two-stage selection models as detailed below. As a first-stage location choice model, we estimate the Probit model. We regress a binary variable of

[15] Thanks to an anonymous reviewer's suggestion, we also conducted simple slope tests to see whether the relationship between the technology intensity of the US MNCs and the percentage acquired in their international M&A deals is significant with regard to both *High IP* and *Low IP*. The slopes for both *High IP* and *Low IP* are positive and statistically significant, suggesting that the positive effects of the technology intensity of the US MNCs are significant no matter whether the target firms are operating in host countries with strong IP institution or not.

$EquityInvest_{i,m,t}$, (equal to 1 if a US MNC i purchases any equity investment in any target firms in host countries grouped in a specific region m in a given year t) on a set of independent variables which are identified in prior studies (Flores et al., 2013) to affect location choice of US MNCs. Along with industry and year fixed effects to control for any time-invariant macro-economic and industry shocks. Consistent with Vasudeva et al. (2018), we intentionally establish a model of US MNC's location choice where we assume that a US MNC chooses to invest not in a specific host country but a specific region[16] of the host country before choosing how much equity investment to make in a target firm in the host country.

To satisfy exclusion restrictions that are required for Heckman two-stage selection model, we identify a set of two (2) exogenous variables and include them as instrumental variables in the first-stage location choice model as follows. To be specific, we select two cultural variables (UA and FO) of host countries, given that both cultural variables are exogenous in nature and their influence on international M&A activities should be *indirect* through their *distance* (cultural distance) from those of the US.

Once we obtain the Inverse Mills Ratio (IMR) from the first-stage location choice model, we next implement the second-stage Heckman selection estimations where the dependent variable is the percentage of equity ownership acquired by US MNCs, and each IP institution (H1), R&D/Assets (H2) and their interaction (H3) is used as a focal explanatory variable of interest along with the same control variables with the following adjustments to convincingly control for

[16] Unlike Flores and Aguilera (2007) model of US MNC location choice which reports that an average number of host countries that US MNCs made their direct investments is 22.9 (28.9) out of 147 countries in 1980 (2001), we observe in our sample that an average number of host countries that a US MNC has ever made any equity investment during our entire sample period is only 2.31 such that we do not have sufficient variation in the dependent variable for the first-stage choice model if we restrict the location choice of US MNC investment to a specific host country. Therefore, we expand US MNC's location choice to a specific region where several host countries belong. To define a region of a host country we use the geography-based regional grouping scheme adapted from the general scheme used by prior studies (Flores et al., 2013).

potential sample-selection bias. First, IMR is included as an additional control variable. Second, all two exogenous variables identified as valid instrument variables in the first-stage location choice model are excluded from the second-stage Heckman selection estimations to satisfy exclusion restrictions. Model (1) in Table 7 reports the results of the first-stage location choice model where we find that all two instruments for exclusion restrictions have strong statistical power in explaining for US MNC's choice of location to invest. As reported in Models (2) to (3), both IP institution (H1) and R&D/Assets (H2) continue to exhibit the same significantly positive association with the percentage of equity ownership acquired by US MNCs while their interaction term also continues to carry the same negative coefficient in Models (4) and (5), reconfirming our primary findings even after we correct for possible endogeneity due to the sample-selection bias. The statistically insignificant IMR coefficients in two out of four Models (2) to (5) imply that the sample-selection bias in our study might not be as severe as we were initially concerned.

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Exploring Endogeneity: The Instrumental Variable (IV) Approach

Critics might argue that the observed positive coefficient of the IP institutions in the host country of a target firm is a mere reflection of its endogenous relationships with the percentage of equity ownership bought by US MNCs. In other words, the IP institutions in the host country of a target firm scorrelate with the percentage bought by US MNCs in the cross-border M&A deals but do not cause it. However, this reverse causality does not appear likely in our study because target firm-level M&A activities are unlikely to affect country-specific IP institutions in the host country. The other endogeneity concern is related to omitted variables that affect a dependent variable and an explanatory variable of interest in the same equation simultaneously. To establish the causal

effect of IP institutions by alleviating possible endogeneity concerns, we conducted an instrumental-variable (IV) analysis.[17]

Based on previous studies (Shoham, 2022), we considered the dropping of the pronoun in the dominant language of a host country ("*Pronoun drop"*) as our instrumental variable. In recent years there has been a growing body of literature, particularly in economics and finance, and more recently in management and accounting, that uses grammatical structures as instrumental variables to establish casualty (Shoham, Almor, Lee, & Ahammad, 2017; Shoham & Lee, 2018; Almor, Bazel-Shoham, & Lee, 2019). Kashima and Kashima (1998) noted that languages that allow a pronoun drop tend to be less individualistic cultures than those languages that do not allow a pronoun drop. Tabellini (2008) claimed "that languages that forbid pronoun dropping are typical of cultural traditions that gave more emphasis to the individual relative to his social context and thus were more respectful of the individual and his rights." Givati and Troiano (2012) also used grammatical structure to establish casualty in legal institutions.

First, we executed the first-stage IV regressions in Equation (4) and examined whether the grammatical rule allowing pronoun dropping[18] in the language of a host country is relevant in explaining variation in the IP institutions in the same host country.

(4) $$IP\ institutions = \alpha + \beta_1 * Pronoun\ drop + \beta_2\ Controls + Industry\text{-}fixed\ effect + Year\text{-}fixed\ effects + \varepsilon.$$

[17] The IV analysis is known to be beneficial as it addresses three important threats to the internal validity of regression models: (1) omitted variable bias, (2) reverse causality bias, and (3) errors-in-variable bias. It relies on an instrumental variable to introduce random variation in the explanatory variable of interest, but not the dependent variable. This approach mimics randomization in a randomized experiment.

[18] For the pronoun drop in the language of a host country to be a valid instrumental variable in the IV estimation, it should be relevant in explaining variations in the level of the IP institutions and should not be the result of the FDI decisions of US MNCs. In other words, variation in the pronoun drop across host countries should have an exogenous shock only on the level of the IP institutions in the same host countries, not on the FDI in the US MNCs' equity investments in target firms in the same host countries. We believe that our instrumental variable satisfies both conditions at the same time.

As Models 1 and 3 in Appendix 2 indicate, the pronoun drop has a significantly negative coefficient, confirming that it is a very relevant instrumental variable. The negative coefficient also supports the contention that a host country's language whose grammatical structure allows the pronoun to drop tends to have weaker IP institutions in place, consistent with Tabellini (2008).

Once we identified the pronoun drop as a valid instrumental variable, we conducted the second-stage IV regressions expressed in Equation (5).

(5) $International\ M\&As = \alpha + \beta_1 * Predicted\ value\ of\ IP\ institutions + \beta_2\ Controls + Industry\text{-}fixed\ effect + Year\text{-}fixed\ effects + \varepsilon.$

For the second-stage IV regression methods, we used the predicted value of the IP institutions obtained from the first-stage IV regressions presented in Models 1 and 3 as an explanatory variable. We also used the same control variables as in the baseline regressions reported in Table 3 and the percentage of equity ownership acquired by the US MNCs as the dependent variable. As Models 2 and 4 in Appendix 2 indicate, the IP institutions still exhibit a significantly positive association with the percentage of equity ownership acquired by the US MNCs, the same as reported in Table 3. The high IV F-statistics refute the null hypothesis that the pronoun drop is a weak instrumental variable in all models. Similarly, the statistically insignificant Durbin P-value suggests that endogeneity concerns are not as severe as we initially expected. These findings in Appendix 2 reconfirm our earlier results reported in Table 3, showing that the local IP institutions are a key determinant of US MNCs acquisitions, even after controlling for possible endogeneity concerns.

Discussion

As we argued earlier, international acquisitions are an essential part of MNCs' operation, especially expansion (Contractor et al., 2014; Angwin & Meadows, 2015). In this study, we contribute to this debate by examining the level of ownership in foreign acquisitions using the theoretical lens of institutional theory (North, 1990). Our findings support our three hypotheses. Host countries with strong IP protection in terms of laws and enforcement attract higher equity in international acquisition. Technologically intensive MNCs tend to have higher equity in their foreign acquisitions compared to less technologically intensive MNCs. Finally, stronger IP protection and enforcement institutions in the host country negatively moderate the relationship between technologically intensive investment and the percentage of equity acquired in the target subsidiary.

If there is one agreement in the literature, institutions do matter as part of the economic geography of the MNC (e.g., Ahammad et al. 2018; Delios & Beamish 1999; Dikova & Van Witteloostuijn 2007). But the impact of IP institutions of the host country on equity acquired in the target subsidiary is not clear. On the one hand, minimal IP protection and good governance are needed for any investment to take place or feel safe, especially in sensitive technologies and knowledge-intensive industries. On the other hand, a strong IP regime can replace the need for ownership as markets can be more efficient when good governance and IP protection are strong, requiring less ownership to control and monitor foreign acquisitions. However, paradoxically, IP protection as part of the governance environment promotes technology investment but also replaces the need for it because target firms can trade with the acquirer or use contractual modes of entry. We resolve this conflict predicted by the theory by adding an interactive term between IP protection and R&D intensity.

The policy implications of our results are interesting. As countries open up their markets and improve their governance, particularly their IP regime, they may discover that investment declines, particularly from technology-intensive industries. This result occurs because local firms (subsidiaries) may work through market mechanisms to transfer know-how and goods across borders, reducing the need to internalize operations. This result is not necessarily bad for the host market. It simply changes the configuration of the ownership of local resources. Countries that improve their IP regime will still receive more investment in general and across industrial sectors. However, less ownership will be needed for these investments, especially if the companies are R&D dependent.

As technology-based companies are more dependent on IP, improvements in IP protection may impact these firms more strongly but in the opposite direction than would otherwise be logically inferred. The theory suggests that improving IP protection will reduce their needed investment and, thus, ownership in the subsidiaries even more than in other firms.

Conclusion

Based on a comprehensive sample of 7,238 international M&A deals made by US MNCs in 33 host countries, we find highly significant and robust results supporting all three hypotheses we propose in this study. First, we document the positive effect of local IP institutions on US MNCs' equity ownership of target foreign firms, shedding light on the importance of local IP institutions as a significant locational factor contributing to higher equity acquisition in the target firm. Our IV estimation, where we use a grammatical rule allowing pronoun dropping in a host country's language, confirms that the positive effects are robust to possible endogeneity concerns. Second, we provide robust evidence supporting that US MNCs tend to make more equity investments in

international acquisitions when they are technology-intensive. Lastly, we find that the observed positive effect of the technology intensity of US MNCs' activities is moderated when their target firms operate in countries with strong local IP institutions.

Our results should be interpreted with caution. First, our paper analyzed only a subset of entry modes: establishment modes using investment. Our results could be affected by the fact that consideration of other entry modes systematically bears on the ownership sought in international acquisitions. Although many studies deal with the choice between FDI and licensing, it would be useful for future research on the topic to include other establishment modes, such as greenfield and brownfield to address this limitation. Second, our study deals with international acquisitions only from the perspective of ownership strategy. Therefore, we did not consider other aspects of international acquisition, such as post-acquisition integration, reverse knowledge transfer, and absorptive capacity. However, doing so could be a topic for future studies. Also, the empirical results have additional limitations because the sample only includes completed deals but doesn't include withdrawn M&A deals.

Finally, our analysis is based on US-based corporations as the acquirers. While these companies are currently the largest investors abroad, new emerging markets are taking an increasing share of FDI, particularly China (Alon et al., 2020). US-based companies have firm-specific advantages such as proprietary technology, tacit knowledge, and well-known global brands. Therefore, the protection of IP and good governance are key to their involvement. In contrast, Chinese companies have strong home-country advantages and fewer firm-specific advantages. Given the changing landscape, we need studies about patterns of emerging market firms to further test the theory, particularly concerning the combination of weak firm-specific advantages coupled with strong location-specific advantages.

The recent surge of emerging-economy multinational enterprises (EMNCs) has provoked a debate on whether existing international business theories can explain this phenomenon (Verbeke & Kano, 2015). The use of this theory to investigate multinational enterprises from emerging countries poses an important test for theories about multinational enterprises because of their theoretical inclusivity and because they have the ability to connect and explain seemingly disparate phenomena (Buckley, 2018). We encourage researchers to test the theory using the entry modes of emerging market multinationals.

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Table 1. List of 33 Host Countries in Our Sample of 7,238 International M&As

Country	Obs.	Frequency (%)	Country	Obs.	Frequency (%)
Argentina	95	1.31	Malaysia	33	0.46
Australia	512	7.07	Mexico	175	2.42
Austria	31	0.43	Netherlands	234	3.23
Brazil	196	2.71	New Zealand	70	0.97
Canada	1,514	20.92	Philippines	26	0.36
Colombia	21	0.29	Poland	56	0.77
Denmark	84	1.16	Portugal	12	0.17
Finland	50	0.69	Singapore	81	1.12
France	448	6.19	Slovenia	4	0.06
Germany	575	7.94	South Africa	32	0.44
Greece	12	0.17	Spain	230	3.18
Hungary	23	0.32	Sweden	168	2.32
India	156	2.16	Switzerland	125	1.73
Indonesia	11	0.15	Thailand	26	0.36
Israel	193	2.67	Turkey	25	0.35
Italy	190	2.63	United Kingdom	1,676	23.16
Japan	154	2.13	**Total**	**7,238**	**100.00**

Table 2: Descriptive statistics

Panel A. Descriptive statistics	Obs.	Mean	Median.	Std Dev	25th	75th
[Dependent variable]						
Percentage acquired by US MNCs	7,238	93.12	100.00	18.00	100.00	100.00
[Independent variables]						
IP institutions	7,238	7.58	8.30	1.67	7.30	8.60
R&D/Assets	3,288	0.05	0.01	0.09	0.00	0.06
[Host country-specific]						
Restrictiveness index I	7,238	0.03	0.00	0.11	0.00	0.00
Restrictiveness Total Index	7,238	0.08	0.02	0.13	0.00	0.11
Same border (Mexico, Canada)	7,238	0.23	0.00	0.42	0.00	0.00
Sovereign credit rating	7,238	20.16	22.00	3.54	20.00	22.00
Level of FDI inflow	7,238	3.49	2.73	2.83	1.52	4.40
GDP (10 millions)	7,238	157.80	152.82	105.05	70.54	241.09
GDP per capita (10,000)	7,238	3.36	3.45	1.50	2.42	4.36
[Host-Home country distance]						
Log (Geographical distance)	7,238	8.69	8.66	0.48	8.63	8.84
UA-Gap (US-Host country)	7,238	0.91	0.51	1.08	0.21	0.68
FO-Gap (US-Host country)	7,238	0.73	0.39	1.14	0.08	0.54
[Acquiror-specific]						
US MNC is public (Yes/No)	7,238	0.63	1.00	0.48	0.00	1.00
Prior Presence in Host country	7,238	0.18	0.00	0.38	0.00	0.00
[Target-specific]						
Same industry (2-digit SIC)	7,238	0.47	0.00	0.50	0.00	1.00
Log (Target firm market value)	7,238	3.90	3.81	1.91	2.49	5.23
[Deal-specific]						
Friendly Offer (Yes/No)	7,238	0.98	1.00	0.14	1.00	1.00
Tender Offer (Yes/No)	7,238	0.05	0.00	0.22	0.00	0.00

The sample contains International M&A investments by US MNCs during 1998-2017.

Panel B. Correlation coefficients		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1)	Percentage acquired by US MNCs	1.000									
(2)	IP institutions	0.194***	1.000								
(3)	R&D/Assets	0.090***	0.082***	1.000							
(4)	Restrictiveness type 1	-0.052***	-0.153***	-0.068***	1.000						
(5)	Restrictiveness total index	-0.049***	-0.062***	-0.085***	0.892***	1.000					
(6)	Same border (Mexico, Canada)	0.074***	0.152***	-0.032	0.103***	0.332***	1.000				
(7)	Sovereign credit rating	0.191***	0.877***	0.057**	-0.175***	-0.134***	0.113***	1.000			
(8)	Level of FDI inflow	0.111***	0.274***	-0.024	-0.113***	-0.197***	-0.097***	0.338***	1.000		
(9)	GDP (10 millions)	0.030*	0.112***	-0.038*	-0.147***	-0.303***	-0.195***	0.286***	0.344***	1.000	
(10)	GDP per capita (10,000)	0.178***	0.619***	0.041*	-0.190***	-0.205***	0.021	0.677***	0.165***	0.356***	1.000
(11)	Log (Geographical distance)	-0.147***	-0.200***	-0.001	0.007	-0.018	-0.758***	-0.252***	-0.215***	-0.068***	-0.134***
(12)	UA-Gap (US-Host country)	0.034**	0.301***	0.083***	-0.070***	-0.184***	-0.233***	0.232***	-0.029*	0.013	0.268***
(13)	FO-Gap (US-Host country)	-0.084***	-0.464***	-0.035*	0.041***	-0.059***	-0.163***	-0.370***	-0.311***	-0.265***	-0.209***
(14)	US MNC is public (Yes/No)	0.080***	0.087***	0.001	-0.041***	-0.041***	0.022	0.070***	0.031**	-0.034**	0.014
(15)	Number of prior equity investment	-0.011	-0.026*	-0.062***	-0.006	-0.024*	-0.041***	-0.011	-0.022	0.081***	0.053***
(16)	Same industry (2-digit SIC)	-0.012	-0.001	0.071***	-0.029*	-0.004	0.052***	-0.020	-0.006	-0.073***	-0.048***
(17)	Log (Target firm market value)	-0.122***	0.018	-0.140***	-0.026*	-0.081***	-0.120***	0.046***	0.001	0.132***	0.133***
(18)	Friendly Offer (Yes/No)	0.130***	0.023*	-0.004	-0.015	-0.009	0.039***	0.018	0.011	0.008	0.012
(19)	Tender Offer (Yes/No)	-0.133***	0.065***	0.002	-0.004	0.003	0.009	0.050***	0.011	-0.055***	-0.017

		(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(11)	Log (Geographical distance)	1.000								
(12)	UA-Gap (US-Host country)	0.055***	1.000							
(13)	FO-Gap (US-Host country)	0.120***	-0.003	1.000						
(14)	US MNC is public (Yes/No)	-0.050***	0.073***	-0.046***	1.000					
(15)	Prior Presence in Host country	0.017	-0.016	0.025*	-0.238***	1.000				
(16)	Same industry (2-digit SIC)	-0.025*	-0.003	-0.024*	0.195***	-0.119***	1.000			
(17)	Log (Target firm market value)	0.028*	0.093***	0.008	-0.026*	0.169***	-0.034**	1.000		
(18)	Friendly Offer (Yes/No)	-0.049***	-0.016	-0.006	0.046***	-0.018	0.011	-0.077***	1.000	
(19)	Tender Offer (Yes/No)	-0.015	0.036**	-0.016	-0.001	-0.012	0.012	0.143***	-0.086***	1.000

*, **, and *** denote two-tailed significance at the 10%, 5%, and 1% level, respectively

Table 3. H1: OLS/TOBIT estimation

	(1)	(2)	(3)	(4)
Regression model	OLS	OLS	TOBIT	TOBIT
VARIABLES	Percentage of Equity Ownership Acquired by US MNC			
IP institutions	1.042**	1.037**	6.030***	6.024***
	(0.437)	(0.437)	(1.844)	(1.841)
[Host country-specific]				
Restrictiveness index I	1.339		2.749	
	(2.403)		(9.927)	
Restrictiveness Total Index		2.529		9.105
		(2.320)		(9.964)
Same border (Mexico, Canada)	-4.643***	-5.064***	-18.445***	-20.039***
	(0.994)	(1.105)	(5.683)	(6.042)
Sovereign credit rating	0.104	0.100	-0.546	-0.563
	(0.190)	(0.190)	(0.708)	(0.709)
Level of FDI inflow	0.216**	0.217**	1.885***	1.895***
	(0.094)	(0.094)	(0.552)	(0.552)
GDP (10 millions)	-0.014***	-0.013***	-0.065***	-0.064***
	(0.003)	(0.003)	(0.013)	(0.013)
GDP per capita (10,000)	1.156***	1.174***	6.424***	6.520***
	(0.381)	(0.380)	(1.705)	(1.696)
[Host-Home country distance]				
Log (Geographical distance)	-6.990***	-7.258***	-31.774***	-32.747***
	(0.867)	(0.926)	(4.263)	(4.447)
UA-Gap (US-Host country)	-0.619**	-0.609**	-3.254**	-3.201**
	(0.247)	(0.245)	(1.267)	(1.266)
FO-Gap (US-Host country)	-0.288	-0.267	-1.797*	-1.691
	(0.298)	(0.298)	(1.079)	(1.089)
[Acquirer-specific]				
US MNC is public (Yes/No)	2.335***	2.336***	14.165***	14.183***
	(0.472)	(0.472)	(2.474)	(2.472)
Prior Presence in Host country	-0.125	-0.123	1.580	1.593
	(0.560)	(0.560)	(2.874)	(2.873)
[Target-specific]				
Same industry (2-digit SIC)	-0.746	-0.747	-0.266	-0.266
	(0.461)	(0.461)	(2.586)	(2.586)
Log (Target firm market value)	-1.073***	-1.071***	-6.315***	-6.312***
	(0.134)	(0.134)	(0.660)	(0.660)
[Deal-specific]				
Friendly Offer (Yes/No)	12.098***	12.092***	35.629***	35.623***
	(2.386)	(2.387)	(5.855)	(5.857)
Tender Offer (Yes/No)	-9.682***	-9.692***	-42.931***	-42.967***
	(1.603)	(1.601)	(3.950)	(3.943)
Constant	135.706***	137.940***	387.660***	395.305***
	(10.094)	(10.525)	(47.698)	(48.737)
Observations	7,238	7,238	7,238	7,238
R-squared	0.137	0.137		
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adjusted/Pseudo R-square	0.124	0.124	0.0581	0.0581

US MNC-level Clustered standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4. H1: Ordered logit estimation

	(1)	(2)	(3)	(4)
Regression model	OLOGIT	OLOGIT	OLOGIT	OLOGIT
VARIABLES	3 Categories (3=100%, 2=Majority, 1=Minority Acquisitions by US MNC)		11 Categories (10=100%, 9=90%>= & <100%, and so on until 0=less than 10% Acquisitions by US MNC)	
IP institutions	0.187***	0.187***	0.178***	0.179***
	(0.056)	(0.056)	(0.056)	(0.056)
[Host country-specific]				
Restrictiveness index I	-0.035		-0.014	
	(0.329)		(0.322)	
Restrictiveness Total Index		0.177		0.197
		(0.325)		(0.321)
Same border (Mexico, Canada)	-0.428**	-0.464**	-0.449**	-0.489**
	(0.178)	(0.189)	(0.180)	(0.190)
Sovereign credit rating	-0.017	-0.017	-0.018	-0.019
	(0.021)	(0.021)	(0.022)	(0.022)
Level of FDI inflow	0.062***	0.062***	0.063***	0.063***
	(0.018)	(0.018)	(0.018)	(0.018)
GDP (10 millions)	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
GDP per capita (10,000)	0.182***	0.185***	0.202***	0.206***
	(0.055)	(0.054)	(0.056)	(0.056)
[Host-Home country distance]				
Log (Geographical distance)	-0.923***	-0.944***	-0.945***	-0.969***
	(0.131)	(0.137)	(0.132)	(0.138)
UA-Gap (US-Host country)	-0.096**	-0.095**	-0.094**	-0.093**
	(0.039)	(0.039)	(0.039)	(0.039)
FO-Gap (US-Host country)	-0.047	-0.045	-0.057*	-0.055
	(0.034)	(0.034)	(0.033)	(0.034)
[Acquirer-specific]				
US MNC is public (Yes/No)	0.431***	0.432***	0.440***	0.441***
	(0.078)	(0.078)	(0.078)	(0.078)
Prior Presence in Host country	0.071	0.071	0.053	0.053
	(0.090)	(0.090)	(0.091)	(0.091)
[Target-specific]				
Same industry (2-digit SIC)	-0.026	-0.026	-0.036	-0.036
	(0.082)	(0.082)	(0.082)	(0.082)
Log (Target firm market value)	-0.187***	-0.187***	-0.190***	-0.190***
	(0.021)	(0.021)	(0.021)	(0.021)
[Deal-specific]				
Friendly Offer (Yes/No)	0.997***	0.996***	1.074***	1.072***
	(0.187)	(0.187)	(0.191)	(0.191)
Tender Offer (Yes/No)	-1.348***	-1.349***	-1.397***	-1.398***
	(0.129)	(0.129)	(0.135)	(0.135)
Observations	7,238	7,238	7,238	7,238
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Pseudo R-square	0.124	0.124	0.0916	0.0916

US MNC-level Clustered standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5. H2: OLS/Ordered logit estimation

Panel A: R&D/Assets	(1)	(2)	(3)	(4)
Regression model	OLS	OLS	OLOGIT	OLOGIT
VARIABLES	Percentage of Equity Ownership Acquired by US MNC		3 Categories (3=100%, 2=Majority, 1=Minority Acquisitions by US MNC)	
R&D/Assets	5.994***	6.083***	3.625***	3.691***
	(2.215)	(2.219)	(1.398)	(1.404)
[Host country-specific]				
Restrictiveness index I	-3.899		-0.776	
	(4.230)		(0.571)	
Restrictiveness Total Index		-1.251		-0.231
		(4.096)		(0.612)
Same border (Mexico, Canada)	-2.623*	-2.529	-0.094	-0.096
	(1.439)	(1.684)	(0.313)	(0.344)
Sovereign credit rating	0.484**	0.495**	0.055*	0.058**
	(0.205)	(0.205)	(0.029)	(0.029)
Level of FDI inflow	0.143	0.145	0.064**	0.064**
	(0.135)	(0.135)	(0.031)	(0.031)
GDP (10 millions)	-0.008*	-0.008*	-0.001*	-0.001*
	(0.004)	(0.004)	(0.001)	(0.001)
GDP per capita (10,000)	0.977**	0.988**	0.203**	0.206**
	(0.494)	(0.494)	(0.084)	(0.084)
[Host-Home country distance]				
Log (Geographical distance)	-5.581***	-5.498***	-0.846***	-0.835***
	(1.301)	(1.419)	(0.226)	(0.240)
UA-Gap (US-Host country)	-0.242	-0.258	-0.017	-0.020
	(0.312)	(0.311)	(0.062)	(0.062)
FO-Gap (US-Host country)	-0.247	-0.241	-0.044	-0.042
	(0.390)	(0.390)	(0.053)	(0.054)
[Acquirer-specific]				
Prior Presence in Host country	-0.038	-0.051	0.129	0.124
	(0.844)	(0.843)	(0.174)	(0.174)
[Target-specific]				
Same industry (2-digit SIC)	-1.307**	-1.312**	-0.106	-0.107
	(0.613)	(0.613)	(0.130)	(0.130)
Log (Target firm market value)	-1.074***	-1.073***	-0.232***	-0.231***
	(0.212)	(0.212)	(0.036)	(0.037)
[Deal-specific]				
Friendly Offer (Yes/No)	18.680***	18.663***	1.833***	1.829***
	(4.849)	(4.856)	(0.388)	(0.391)
Tender Offer (Yes/No)	-4.480**	-4.482**	-0.920***	-0.919***
	(2.114)	(2.115)	(0.246)	(0.246)
Constant	125.406***	124.479***		
	(14.183)	(15.013)		
Observations	3,288	3,288	3,288	3,288
R-squared	0.139	0.138		
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adjusted/Pseudo R-square	0.110	0.110	0.145	0.144

Panel B: Industry technology intensity	(1)	(2)	(3)	(4)
Regression model	OLS	OLS	OLOGIT	OLOGIT
VARIABLES	Percentage of Equity Ownership Acquired by US MNC		3 Categories (3=100%, 2=Majority, 1=Minority Acquisitions by US MNC)	
High-tech (Yes/No)	2.769***	2.792***	0.615***	0.621***
	(0.546)	(0.545)	(0.111)	(0.112)
[Host country-specific]				
Restrictiveness index I	1.591		0.033	
	(2.388)		(0.324)	
Restrictiveness Total Index		3.023		0.297
		(2.307)		(0.323)
Same border (Mexico, Canada)	-3.815***	-4.318***	-0.259	-0.314*
	(1.000)	(1.106)	(0.178)	(0.188)
Sovereign credit rating	0.413***	0.407***	0.034**	0.033*
	(0.145)	(0.146)	(0.017)	(0.017)
Level of FDI inflow	0.246***	0.248***	0.070***	0.071***
	(0.094)	(0.094)	(0.018)	(0.018)
GDP (10 millions)	-0.015***	-0.015***	-0.002***	-0.002***
	(0.003)	(0.003)	(0.000)	(0.000)
GDP per capita (10,000)	1.479***	1.498***	0.258***	0.263***
	(0.367)	(0.365)	(0.050)	(0.050)
[Host-Home country distance]				
Log (Geographical distance)	-6.456***	-6.776***	-0.798***	-0.832***
	(0.874)	(0.931)	(0.130)	(0.136)
UA-Gap (US-Host country)	-0.462*	-0.451*	-0.060	-0.059
	(0.238)	(0.237)	(0.037)	(0.037)
FO-Gap (US-Host country)	-0.520**	-0.493*	-0.081***	-0.077**
	(0.264)	(0.264)	(0.031)	(0.031)
[Acquirer-specific]				
US MNC is public (Yes/No)	1.931***	1.930***	0.345***	0.345***
	(0.486)	(0.486)	(0.080)	(0.080)
Prior Presence in Host country	0.012	0.014	0.104	0.104
	(0.569)	(0.569)	(0.092)	(0.092)
[Target-specific]				
Same industry (2-digit SIC)	-1.083**	-1.086**	-0.095	-0.096
	(0.461)	(0.461)	(0.081)	(0.081)
Log (Target firm market value)	-1.008***	-1.005***	-0.176***	-0.175***
	(0.134)	(0.134)	(0.021)	(0.021)
[Deal-specific]				
Friendly Offer (Yes/No)	12.066***	12.057***	1.002***	1.001***
	(2.383)	(2.384)	(0.188)	(0.188)
Tender Offer (Yes/No)	-9.693***	-9.706***	-1.360***	-1.361***
	(1.608)	(1.606)	(0.133)	(0.132)
Constant	132.331***	134.996***		
	(10.200)	(10.606)		
Observations	7,238	7,238	7,238	7,238
R-squared	0.139	0.139		
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adjusted/Pseudo R-square	0.126	0.126	0.127	0.127

US MNC-level Clustered standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 6. H3: Interaction analysis between IP institutions and technology intensity

Panel A. R&D/Assets	(1)	(2)	(3)	(4)
Regression model	OLS	OLS	OLS	OLS
VARIABLES	Percentage of Equity Ownership Acquired by US MNC			
Interaction of R&D/Assets with either High IP (Yes/No) or IP Institutions	-7.997*	-7.949*	-2.371	-2.354
	(4.430)	(4.434)	(1.868)	(1.868)
High IP (Yes/No)	1.975**	2.026**		
	(0.959)	(0.960)		
IP institutions			1.606**	1.618**
			(0.662)	(0.662)
R&D/Assets	9.788***	9.852***	23.825	23.771
	(3.143)	(3.148)	(14.763)	(14.760)
[Host country-specific]				
Restrictiveness index I	-3.526		-3.680	
	(4.206)		(4.221)	
Restrictiveness Total Index		-1.307		-1.295
		(4.084)		(4.090)
Same border (Mexico, Canada)	-3.421**	-3.330*	-3.226**	-3.122*
	(1.509)	(1.739)	(1.457)	(1.709)
Sovereign credit rating	0.396*	0.404*	0.003	0.010
	(0.209)	(0.209)	(0.286)	(0.286)
Level of FDI inflow	0.142	0.143	0.149	0.151
	(0.135)	(0.135)	(0.136)	(0.135)
GDP (10 millions)	-0.006	-0.006	-0.005	-0.005
	(0.004)	(0.004)	(0.005)	(0.005)
GDP per capita (10,000)	0.888*	0.895*	0.501	0.507
	(0.492)	(0.492)	(0.501)	(0.501)
[Host-Home country distance]				
Log (Geographical distance)	-6.008***	-5.926***	-6.112***	-6.025***
	(1.319)	(1.433)	(1.307)	(1.429)
UA-Gap (US-Host country)	-0.433	-0.454	-0.408	-0.424
	(0.332)	(0.331)	(0.324)	(0.323)
FO-Gap (US-Host country)	-0.124	-0.118	0.193	0.201
	(0.397)	(0.396)	(0.440)	(0.439)
[Acquirer-specific]				
Prior Presence in Host country	-0.041	-0.051	-0.169	-0.182
	(0.845)	(0.844)	(0.838)	(0.837)
[Target-specific]				
Same industry (2-digit SIC)	-1.309**	-1.314**	-1.287**	-1.292**
	(0.614)	(0.614)	(0.611)	(0.611)
Log (Target firm market value)	-1.065***	-1.064***	-1.064***	-1.063***
	(0.213)	(0.213)	(0.212)	(0.213)
[Deal-specific]				
Friendly Offer (Yes/No)	18.663***	18.647***	18.877***	18.863***
	(4.861)	(4.866)	(4.842)	(4.848)
Tender Offer (Yes/No)	-4.538**	-4.540**	-4.536**	-4.538**
	(2.111)	(2.111)	(2.107)	(2.108)
Constant	129.973***	129.116***	128.280***	127.336***
	(14.361)	(15.165)	(14.167)	(15.025)

Observations	3,288	3,288	3,288	3,288
R-squared	0.140	0.140	0.141	0.141
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adjusted R-square	0.111	0.111	0.113	0.113

Panel B. Industry technology intensity	(1)	(2)	(3)	(4)
Regression model	OLS	OLS	OLS	OLS
VARIABLES	Percentage of Equity Ownership Acquired by US MNC			
Interaction of High-tech (Yes/No) with either High IP (Yes/No) or IP Institution	-3.035***	-3.053***	-1.283***	-1.290***
	(0.863)	(0.863)	(0.353)	(0.353)
High IP (Yes/No)	2.102***	2.076***		
	(0.757)	(0.757)		
IP institutions			1.282***	1.278***
			(0.445)	(0.445)
High-tech (Yes/No)	4.554***	4.587***	12.766***	12.841***
	(0.780)	(0.780)	(2.925)	(2.926)
[Host country-specific]				
Restrictiveness index I	1.669		1.504	
	(2.383)		(2.386)	
Restrictiveness Total Index		3.042		3.052
		(2.299)		(2.287)
Same border (Mexico, Canada)	-4.327***	-4.815***	-4.283***	-4.793***
	(1.010)	(1.115)	(0.998)	(1.107)
Sovereign credit rating	0.343**	0.337**	0.092	0.088
	(0.149)	(0.149)	(0.189)	(0.189)
Level of FDI inflow	0.253***	0.254***	0.253***	0.255***
	(0.094)	(0.094)	(0.094)	(0.094)
GDP (10 millions)	-0.014***	-0.014***	-0.014***	-0.014***
	(0.003)	(0.003)	(0.003)	(0.003)
GDP per capita (10,000)	1.406***	1.428***	1.196***	1.220***
	(0.366)	(0.365)	(0.379)	(0.378)
[Host-Home country distance]				
Log (Geographical distance)	-6.775***	-7.090***	-6.942***	-7.268***
	(0.874)	(0.932)	(0.872)	(0.930)
UA-Gap (US-Host country)	-0.549**	-0.532**	-0.532**	-0.520**
	(0.248)	(0.247)	(0.246)	(0.245)
FO-Gap (US-Host country)	-0.407	-0.383	-0.220	-0.195
	(0.270)	(0.270)	(0.298)	(0.298)
[Acquirer-specific]				
US MNC is public (Yes/No)	1.931***	1.929***	1.941***	1.940***
	(0.486)	(0.486)	(0.487)	(0.487)
Prior Presence in Host country	-0.054	-0.052	-0.045	-0.043
	(0.571)	(0.571)	(0.576)	(0.577)
[Target-specific]				
Same industry (2-digit SIC)	-1.132**	-1.135**	-1.070**	-1.074**
	(0.461)	(0.461)	(0.459)	(0.459)
Log (Target firm market value)	-1.000***	-0.997***	-1.000***	-0.998***
	(0.134)	(0.134)	(0.134)	(0.134)

[Deal-specific]				
Friendly Offer (Yes/No)	11.973***	11.964***	12.055***	12.047***
	(2.391)	(2.392)	(2.385)	(2.386)
Tender Offer (Yes/No)	-9.746***	-9.758***	-9.736***	-9.750***
	(1.601)	(1.600)	(1.604)	(1.602)
Constant	135.234***	137.838***	133.511***	136.207***
	(10.146)	(10.549)	(10.135)	(10.554)
Observations	7,238	7,238	7,238	7,238
R-squared	0.141	0.141	0.142	0.143
Year FE	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Adjusted R-square	0.128	0.128	0.129	0.129

US MNC-level Clustered standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

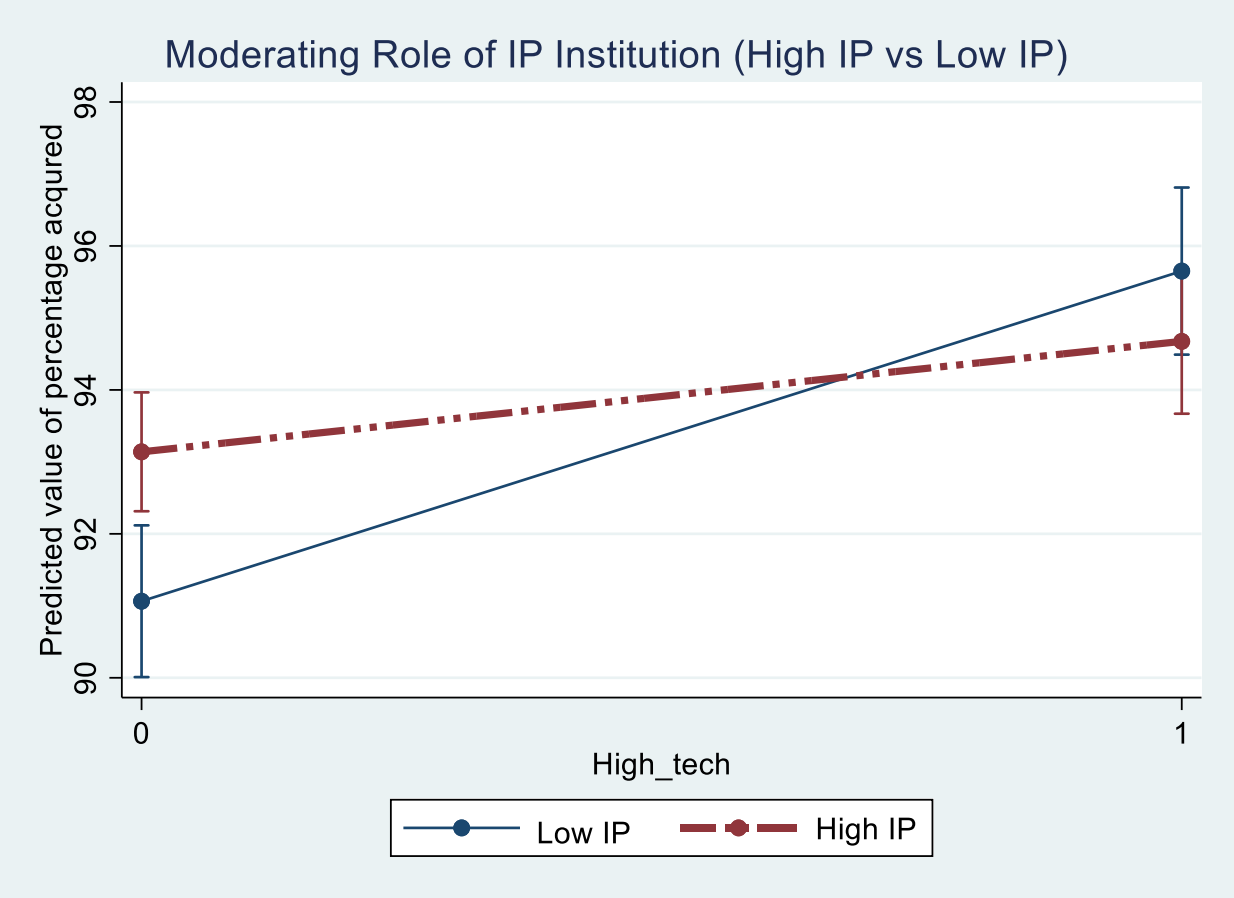
Table 7. Heckman two-stage selection models

	(1)	(2)	(3)	(4)	(5)
Hypothesis		H1	H2	H3	H3
Heckman stage	1st stage	2nd stage	2nd stage	2nd stage	2nd stage
Regression model	PROBIT	OLS	OLS	OLS	OLS
VARIABLES	Percentage of Equity Ownership Acquired by US MNC				
UA (Target Nation)	0.096***				
	(8.678)				
FO (Target Nation)	-0.223***				
	(-21.716)				
Interaction of R&D/Assets with either High IP (Yes/No) or IP Institution				-8.093*	-2.324
				(4.419)	(1.836)
High IP (Yes/No)				2.382**	
				(0.979)	
IP institutions		1.259***			1.999***
		(0.464)			(0.695)
R&D/Assets			6.227***	10.149***	23.670
			(2.226)	(3.139)	(14.465)
[Host country-specific]					
Restrictiveness Total Index	0.299***	-0.604	-4.451	-5.402	-6.622
	(11.391)	(2.752)	(4.645)	(4.665)	(4.673)
Same border (Mexico, Canada)	1.450***	-19.416**	-15.729	-20.410*	-25.432**
	(82.385)	(7.667)	(10.546)	(10.878)	(11.212)
Sovereign credit rating	0.019***	-0.208	0.270	0.098	-0.484
	(10.606)	(0.240)	(0.256)	(0.269)	(0.365)
Level of FDI inflow	0.021***	0.042	-0.023	-0.071	-0.126
	(21.166)	(0.133)	(0.181)	(0.182)	(0.188)
GDP (10 millions)	0.000***	-0.017***	-0.012**	-0.010*	-0.010*
	(6.717)	(0.004)	(0.005)	(0.005)	(0.005)
GDP per capita (10,000)	0.031***	0.921**	0.844*	0.691	0.142
	(7.364)	(0.415)	(0.511)	(0.512)	(0.537)
[Host-Home country distance]					
Log (Geographical distance)	0.702***	-14.402***	-12.047**	-14.403**	-17.157***
	(36.194)	(3.968)	(5.483)	(5.640)	(5.819)
UA-Gap (US-Host country)		-0.578**	-0.211	-0.445	-0.403
		(0.244)	(0.313)	(0.331)	(0.324)
FO-Gap (US-Host country)		-0.521*	-0.527	-0.460	-0.173
		(0.315)	(0.445)	(0.447)	(0.467)
[Acquirer-specific]					
US MNC is public (Yes/No)	-0.014**	2.492***			
	(-2.080)	(0.492)			
Number of prior equity acquisition	0.000	0.042	0.388	0.404	0.281
	(0.403)	(0.029)	(0.409)	(0.411)	(0.407)
[Target-specific]					
Same industry (2-digit SIC)	0.013**	-0.872*	-1.417**	-1.460**	-1.486**
	(2.173)	(0.468)	(0.617)	(0.621)	(0.617)
Log (Target firm market value)	-0.009***	-0.981***	-0.996***	-0.959***	-0.922***
	(-5.752)	(0.148)	(0.222)	(0.224)	(0.225)
[Deal-specific]					

Friendly Offer (Yes/No)		12.020***	18.551***	18.495***	18.728***
		(2.382)	(4.844)	(4.854)	(4.827)
Tender Offer (Yes/No)		-9.702***	-4.459**	-4.523**	-4.516**
		(1.610)	(2.129)	(2.125)	(2.123)
[Inverse mill ratio]					
IMR		-12.799*	-11.839	-15.162	-19.844**
		(6.632)	(9.125)	(9.334)	(9.658)
Constant	-7.640***	230.422***	210.516***	240.237***	272.521***
	(-41.915)	(50.083)	(69.989)	(71.973)	(73.988)
Observations	95,272	7,223	3,288	3,288	3,288
R-squared		0.138	0.139	0.141	0.143
Year FE	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES
Adjusted/Pseudo R-square	0.0563	0.125	0.111	0.112	0.114

US MNC-level Clustered standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure 1.


Moderating Role of IP Institution (High IP vs Low IP)
Predicted value of percentage acqured
90
92
94
96
98
0
1
High_tech
Low IP
High IP

Appendix 1. List of 74 industries (based on 2-digit SIC codes) in our sample

Panel A. Distribution of international M&A deals across industries.

2-digit SIC code	Freq.	2-digit SIC code	Freq.	2-digit SIC code	Freq.
01	15	34	114	60	92
02	9	35	356	61	103
07	9	36	462	62	127
08	5	37	152	63	69
10	156	38	386	64	31
12	19	39	45	65	342
13	213	40	7	67	143
14	22	41	3	70	109
15	12	42	58	72	11
16	16	44	40	73	1,456
17	26	45	18	75	23
20	170	46	8	76	5
21	7	47	39	78	47
22	28	48	238	79	58
23	21	49	141	80	76
24	36	50	170	82	31
25	20	51	93	83	14
26	77	52	3	84	2
27	63	53	16	87	291
28	510	54	21	89	4
29	20	55	13	94	1
30	78	56	25	95	4
31	10	57	13	96	1
32	63	58	29	99	2
33	91	59	50	**Total**	**7,238**

Panel B. Classification of high-tech industries based on 3-digit SIC codes.

3-digit SIC codes	Description
283	Drugs
357	Computer and Office Equipment
366	Communications Equipment
367	Electronic Components and Accessories
382	Measuring and Controlling Devices
481	Telephone Communications
482	Telegraph and Other Communications
489	Communications Services, NEC
737	Computer and Data Processing Services
873	Research, Development, And Testing Services

Appendix 2. H1: Instrumental variable estimation

IV stage	(1) 1st-stage	(2) 2nd-stage	(3) 1st-stage	(4) 2nd-stage
VARIABLES	IP institution	Percentage of Equity Ownership Acquired by US MNC	IP institution	Percentage of Equity Ownership Acquired by US MNC
IP institutions (Predicted)		1.635**		1.605**
		(0.764)		(0.764)
Pronoundrop	-1.214***		-1.214***	
	(0.028)		(0.028)	
[Host country-specific]				
Restrictiveness index I	0.021	1.381		
	(0.063)	(2.083)		
Restrictiveness Total Index			-0.010	2.516
			(0.062)	(2.027)
Same border (Mexico, Canada)	0.667***	-4.935***	0.669***	-5.339***
	(0.030)	(1.047)	(0.032)	(1.111)
Sovereign credit rating	0.221***	-0.070	0.221***	-0.067
	(0.004)	(0.247)	(0.004)	(0.247)
Level of FDI inflow	-0.004	0.215**	-0.004	0.216**
	(0.003)	(0.095)	(0.003)	(0.095)
GDP (10 millions)	-0.001***	-0.013***	-0.001***	-0.012***
	(0.000)	(0.003)	(0.000)	(0.003)
GDP per capita (10,000)	0.266***	0.949**	0.265***	0.975**
	(0.009)	(0.389)	(0.009)	(0.389)
[Host-Home country distance]				
Log (Geographical distance)	0.522***	-7.201***	0.523***	-7.457***
	(0.024)	(0.836)	(0.025)	(0.868)
UA-Gap (US-Host country)	0.160***	-0.711***	0.160***	-0.696***
	(0.006)	(0.244)	(0.006)	(0.243)
FO-Gap (US-Host country)	-0.152***	-0.124	-0.152***	-0.111
	(0.007)	(0.297)	(0.007)	(0.297)
[Acquirer-specific]				
US MNC is public (Yes/No)	-0.020	2.335***	-0.020	2.337***
	(0.013)	(0.436)	(0.013)	(0.436)
Prior Presence in Host country	0.031*	-0.162	0.031*	-0.159
	(0.016)	(0.537)	(0.016)	(0.537)
[Target-specific]				
Same industry (2-digit SIC)	-0.023*	-0.735*	-0.023*	-0.736*
	(0.013)	(0.429)	(0.013)	(0.429)
Log (Target firm market value)	-0.010***	-1.067***	-0.010***	-1.066***
	(0.003)	(0.114)	(0.003)	(0.114)
[Deal-specific]				
Friendly Offer (Yes/No)	0.003	12.093***	0.003	12.086***
	(0.043)	(1.427)	(0.043)	(1.427)
Tender Offer (Yes/No)	0.054*	-9.708***	0.055*	-9.717***
	(0.029)	(0.943)	(0.029)	(0.943)
Constant	-1.458***	136.642***	-1.471***	138.816***
	(0.274)	(9.077)	(0.280)	(9.277)
Observations	7,238	7,238	7,238	7,238
R-squared				
Year FE				

Industry FE	0.909	0.137	0.909	0.137
IV F-stat		1852		1853
Durbin pval		0.384		0.404

Standard error in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Appendix 3. H1: Logit estimating using binary dependent variables

	(1)	(2)	(3)	(4)	(5)	(6)
Regression model	LOGIT	LOGIT	LOGIT	LOGIT	LOGIT	LOGIT
VARIABLES	2 Categories (1=Full Acquisition, 0=Partial Acquisitions by US MNC)		2 Categories (1=Majority 0=Minority Acquisitions by US MNC)		2 Categories (1=Super Majority 0=less than 66.7% Acquisitions by US MNC)	
IP institutions	0.201***	0.200***	0.108	0.109	0.123*	0.123*
	(0.058)	(0.058)	(0.075)	(0.075)	(0.065)	(0.065)
Marginal Effect (IP institution)	0.036***	0.036***	0.010	0.010	0.016*	0.016*
	(0.009)	(0.009)	(0.006)	(0.006)	(0.008)	(0.008)
[Host country-specific]						
Restrictiveness index I	0.056		0.062		0.120	
	(0.326)		(0.426)		(0.348)	
Restrictiveness Total Index		0.306		0.240		0.255
		(0.330)		(0.440)		(0.349)
Same border (Mexico, Canada)	-0.484***	-0.540***	-0.322	-0.366	-0.506**	-0.548**
	(0.183)	(0.194)	(0.267)	(0.285)	(0.220)	(0.232)
Sovereign credit rating	-0.021	-0.022	0.012	0.012	-0.000	-0.001
	(0.022)	(0.022)	(0.029)	(0.029)	(0.025)	(0.025)
Level of FDI inflow	0.062***	0.062***	0.066**	0.066**	0.074***	0.075***
	(0.018)	(0.018)	(0.026)	(0.026)	(0.022)	(0.022)
GDP (10 millions)	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)
GDP per capita (10,000)	0.188***	0.193***	0.193***	0.196***	0.252***	0.254***
	(0.056)	(0.056)	(0.071)	(0.071)	(0.066)	(0.065)
[Host-Home country distance]						
Log (Geographical distance)	-0.947***	-0.981***	-0.933***	-0.960***	-0.969***	-0.996***
	(0.136)	(0.142)	(0.184)	(0.193)	(0.158)	(0.165)
UA-Gap (US-Host country)	-0.102***	-0.101**	-0.084	-0.083	-0.057	-0.055
	(0.040)	(0.040)	(0.054)	(0.054)	(0.046)	(0.046)
FO-Gap (US-Host country)	-0.059*	-0.055	0.006	0.010	-0.020	-0.017
	(0.034)	(0.035)	(0.046)	(0.046)	(0.039)	(0.039)
[Acquiror-specific]						
US MNC is a public (Yes/No)	0.470***	0.470***	0.312***	0.312***	0.435***	0.436***
	(0.082)	(0.082)	(0.114)	(0.114)	(0.095)	(0.095)
Number of prior equity acquisition	0.004	0.005	0.027***	0.028***	0.011*	0.011*
	(0.005)	(0.005)	(0.007)	(0.007)	(0.006)	(0.006)
[Target-specific]						
Same industry (2-digit SIC)	0.018	0.019	-0.258**	-0.257**	-0.114	-0.114
	(0.083)	(0.083)	(0.113)	(0.113)	(0.096)	(0.096)

Log (Target firm market value)	-0.193***	-0.193***	-0.186***	-0.186***	-0.186***	-0.186***
	(0.021)	(0.021)	(0.028)	(0.028)	(0.024)	(0.024)
[Deal-specific]						
Friendly Offer (Yes/No)	1.021***	1.021***	1.053***	1.053***	0.932***	0.932***
	(0.198)	(0.198)	(0.226)	(0.226)	(0.214)	(0.214)
Tender Offer (Yes/No)	-1.413***	-1.415***	-1.130***	-1.131***	-0.961***	-0.962***
	(0.134)	(0.134)	(0.200)	(0.200)	(0.153)	(0.153)
Constant	8.526***	8.794***	8.398***	8.612***	8.796***	9.008***
	(1.512)	(1.544)	(1.926)	(1.982)	(1.690)	(1.731)
Observations	7,211	7,211	7,114	7,114	7,198	7,198
Year FE	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Pseudo R-square	0.153	0.154	0.141	0.141	0.149	0.149

US MNC-level Clustered standard error in parenthesis
*** p<0.01, ** p<0.05, * p<0.1