

**TECHNOLOGICAL ESCAPE AND CROSS-BORDER M&As BY DEVELOPING
COUNTRY MULTINATIONAL COMPANIES ***

Wenjie CHEN

George Washington University, School of Business
Funger Hall, Suite 401, 2201 G Street, NW, Washington, D.C. 20052, USA
Tel.: 1-202-994-3275, chenw@gwu.edu

Alvaro CUERVO-CAZURRA

Northeastern University, D'Amore-McKim School of Business
313 Hayden Hall, 360 Huntington Avenue, Boston, MA 02115, USA
Tel.: 1-617-373-6568, a.cuervo-cazurra@neu.edu

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Abstract

We analyze the performance of cross-border mergers and acquisitions (M&A) by developing country multinational companies (DMNCs) in comparison to those of advanced economy multinational companies (AMNCs). We introduce the technological escape hypothesis, in which we propose that DMNCs address the weak innovation systems of their home countries by escaping to advanced economies and acquiring high intellectual property (HIP) target firms. Specifically, we argue that DMNC acquirers perform relatively worse than AMNC acquirers when purchasing target firms in advanced economies because of their lower ability to operate in the institutional environment there. However, we propose that DMNC acquirers perform relatively better when purchasing HIP target firms in advanced economies because they obtain sophisticated technologies that help them upgrade their home operations and solve their technological comparative disadvantages. Additionally, we argue that target firms acquired by DMNCs in advanced economies perform relatively worse than target firms acquired by AMNCs because the former receive less sophisticated competitive capabilities from the acquiring firm. Moreover, HIP target firms in advanced economies acquired by DMNCs experience even lower relative performance than those acquired by AMNCs because DMNC acquirers are more likely to hollow them out of their advanced technologies than AMNCs. The results of the empirical test support the technological escape hypothesis but not the hollowing out hypothesis.

Key words: Cross-border M&As, developing countries, advanced economies, multinational companies, performance, technology

INTRODUCTION

Developing country multinational companies (DMNCs) have gained notoriety and attention in recent times as some have become leaders in their industries, like the Chinese telecommunication equipment producer Huawei. In their quest for global leadership, DMNCs have engaged in cross-border acquisitions (Madhok and Keyhani, 2012). Cross-border acquisitions in advanced economies have gained particular attention, such as the purchase of the US car brand Jaguar by the Indian conglomerate Tata, because they challenge the view that DMNCs lack intellectual property and knowledge assets to compete on a global level; some view DMNCs as merely benefitting from comparative advantages and economies of scale (Rugman, 2010). It is not fully clear, however, whether DMNCs create value when conducting cross-border acquisitions. In general, acquisitions tend to be a value-destroying strategy (see reviews in Hitt, Ireland and Harrison, 2001; Tuch and O'Sullivan, 2007), and cross-border acquisitions tend to be even more complicated than domestic ones (see a review in Shimizu et al., 2004). Adding to the debate, analyses of DMNCs cross-border acquisitions generate mixed results. For example, while Aybar and Ficici (2009) find that cross-border acquisitions by DMNCs do not create value and in some cases destroy it, Gubbi et al. (2010) find that Indian firms' acquisitions in OECD countries appear to be beneficial.

Hence, we add subtlety to this discussion by analyzing differences in relative performance of cross-border acquisitions by DMNCs in comparison to AMNCs, differentiating between the target firm's location and knowledge assets. This comparison is important for separating outcomes that are specific to cross-border acquisitions by DMNCs from those that also apply to cross-border acquisitions by AMNCs (Chen, 2011; Hope, Thomas and Vyas, 2011).

Specifically, we introduce the technological escape hypothesis, in which we propose that DMNCs address the weak innovation systems of their home countries by escaping from them and acquiring high intellectual property (HIP) target firms in advanced economies. Developing countries tend to have less supportive innovation systems (Furman, Porter and Stern, 2002; Nelson, 1993), undeveloped intermediaries and poor institutions (Khanna and Palepu, 2010), lower property right protection (Quan and Chesbrough, 2010; Zhao, 2006), and inferior levels of technological development (OECD, 2011; WIPO, 2011). DMNCs can solve these shortcomings by escaping to advanced economies and acquiring HIP firms. As a consequence, we propose that although DMNCs tend to experience worse performance than AMNCs when acquiring firms in advanced economies because DMNCs are not as adept at operating in the institutional conditions of advanced economies, DMNCs that purchase HIP target firms in advanced economies perform relatively better because they obtain sophisticated technologies that help them upgrade their home operations and solve their technological comparative disadvantages. Additionally, we argue that target firms acquired by DMNCs in advanced economies perform relatively worse than target firms acquired by AMNCs because the former receive less sophisticated competitive capabilities from the acquiring firm. Moreover, we propose that HIP target firms acquired by DMNCs in advanced economies suffer even lower performance than HIP target firms acquired by AMNCs because DMNC acquirers are more likely to hollow them out of their advanced technology than AMNC acquirers.

We test these arguments on a sample of cross-border M&As involving publicly traded firms around the world for the period 1990-2009. We find support for DMNCs' technological escape hypothesis but not for DMNCs' hollowing out hypothesis. Specifically, we find that DMNCs benefit less than AMNCs when purchasing target firms in advanced economies, but benefit more than AMNCs when acquiring HIP target firms in advanced economies. We also

find that target firms in advanced economies do not suffer more when acquired by DMNCs than when acquired by AMNCs, while HIP target firms in advanced economies suffer when sold regardless of the country of origin of the acquirer.

These arguments and findings contribute to a better understanding of how the country of origin influences a firm's internationalization. Drawing a parallel to the idea of institutional escape, in which firms in countries with poor governance invest in countries with better governance to avoid the poor governance of the home country (Coffee, 2002; Witt and Lewin, 2007), we propose the technological escape hypothesis, in which firms from developing countries invest in HIP companies in advanced economies to solve the technological comparative disadvantages of their home country.

The ideas also contribute to the literature on DMNCs. These firms are perceived as suffering a competitive disadvantage in technology because of the underdeveloped innovation systems in their home countries. For solving these shortcomings, existing studies have suggested to obtain technology from AMNCs by copying their products (Chittoor, Sarkar, Ray and Aulakh, 2009; Luo, Sun and Wang, 2011), allying with AMNCs as part of their supply and distribution chains (Kumaraswamy, Mudambi, Saranga, and Tripathy, 2012; Mathews, 2006) or acquiring firms in advanced economies (Luo and Tung, 2007; Madhok and Keyhani, 2012). We add nuance to the acquisitions recommendation by arguing and explaining that purchasing firms in an advanced economy may solve the comparative disadvantage of the country of origin (Gubbi et al., 2010), but that to capture the benefit of accessing sophisticated technology via acquisitions, DMNCs need to purchase HIP firms and not just any firm in an advanced economy.

THEORY AND HYPOTHESES DEVELOPMENT

DMNCs, Technological Comparative Disadvantage and Capability Upgrading

The study of DMNCs has resurfaced in recent years. Although DMNCs existed in the 19th century, such as the Argentinean shoemaker Alpargatas which entered Uruguay in 1890 and Brazil in 1907, these were exceptions. Most firms from developing countries served their domestic market and at most exported, engaging in foreign direct investment only after the second half of the twentieth century. An interest in understanding DMNCs emerged in the 1970s and 1980s (e.g., Ghymn, 1980; Heenan and Keegan, 1979; Kumar and McLeod, 1981; Lall, 1983; Vernon-Wortzel and Wortzel, 1988; Wells, 1983). These studies revealed that most of the largest DMNCs operated in natural resources and many were state-owned (Heenan and Keegan, 1979) benefitting from developing-country governments' support (Aggarwal and Agmon, 1990). In contrast, the 1990s witnessed a decrease in interest on the topic (with some exceptions like Lecraw, 1993, or Young, Huang, and McDermott, 1996; for a review see Yeung, 1999). Nevertheless, the 2000s saw a resurgence in interest on the subject, not only in the academic literature (e.g. see articles in the special issues edited by Aulakh, 2007; Gammeltoft, Barnard and Madhok, 2010; and Luo and Tung, 2007, and in the books edited by Sauvant, 2008, Sauvant, Maschek, and McAllister, 2010; and Ramamurti and Singh, 2009), but also in newspapers (e.g., Economist, 2008), consulting companies (e.g., BCG, 2011) and investment banks (e.g., Citigroup, 2005).

Some of the recent literature has focused on better understanding the process that enables these firms to upgrade their capabilities to compete against AMNCs on a global level. The need for capability upgrading in DMNCs is twofold. One emerges from the view that these firms suffer late-comer disadvantages in many industries because AMNCs already maintain well established presence there (Bartlett and Ghoshal, 2000; Ramamurti, 2012). The second is based on the liability of emerginness that encompasses the challenges of coming from a developing

country (Madhok and Keyhani, 2012). Moreover, the developing country low-cost comparative advantages that benefitted DMNCs have diminished because AMNCs have established production facilities and even high-value added activities like R&D centers in developing countries (Contractor et al., 2010). Hence, DMNCs face an increasing need to upgrade their technological capabilities.

Unfortunately, developing countries suffer a comparative disadvantage in technology development that limits the technological competitiveness of their firms, relegating them to the lower end of value added chains (Mudambi, 2008). For example, Furman, Porter and Stern (2002) found that poorer countries have weaker conditions that support patent applications, while the Organization for Economic Cooperation and Development's study of technology development (OECD, 2011) showed that less developed countries tend to have lower levels of investments in research and development (R&D) and patent applications than more advanced economies. Two main reasons explain these findings. One is that weaker innovation systems in developing economies limit firms' ability to create technology (Nelson, 1993); in developing countries, the government does not provide as much support for high-technology products, the universities have more limited focus and interest in generating new technologies and collaborating with companies in the development of technologies, companies invest less on R&D, have fewer available scientists and engineers and patent less (Schwab, 2011). Another reason is that the weaker protection of intellectual property rights in developing countries (Tiwari, 2012) reduces firms' incentives for innovation; weak property rights protection encourages piracy and counterfeiting (OECD, 2008) and limits the incentives to engage in innovation because it is not clear that innovators will be able to retain the rights to their own invention and recover the expenses incurred (Quan and Chesbrough, 2010; Zhao, 2006).

To solve the technological comparative disadvantages of their home countries and upgrade capabilities to international levels, the literature suggests that DMNC managers incorporate technology from advanced economy firms (Luo and Tung, 2007; Mathews, 2006), using three methods. One is copying the actions and, in some cases, the technology and innovations of advanced economy firms (Chittoor et al., 2009; Luo, Sun and Wang, 2011). The lower protection of intellectual property rights, not uncommon in developing countries, enables domestic firms to reverse engineer products from advanced economy firms and copy the underlying technologies and innovations. This process benefits the indigenous firms by not having to invest in creating new technology or paying royalties. Another method is to establish alliances with advanced economy companies, becoming part of their global supply and distribution systems (Kumaraswamy et al., 2012; Mathews, 2006; Luo and Tung, 2007). The developing country company benefits from the technology provided by the advanced economy company. It receives product technology that enables it to create more sophisticated products as well as process technology that enables it to produce them more efficiently. A third method is to acquire companies in advanced economies (Luo and Tung, 2007; Madhok and Keyhani, 2012). The developing country firm accesses not only the sophisticated technologies of the advanced economy firm but also the comparative technological advantage of the advanced economy via a direct presence in the advanced country.

Technological Escape and Capability Upgrading by DMNC Acquirers in Advanced Economies

We focus on this third method and analyze DMNCs' acquisitions in advanced economies in more detail. Acquisitions are beneficial but are challenging (see reviews in Hitt, Ireland and Harrison, 2001, and Tuch and O'Sullivan, 2007), and cross-border acquisitions have additional

benefits and challenges (see a review in Shimizu et al, 2004). Since we compare the performance of DMNCs' cross-border acquisitions to AMNCs' ones, we will not discuss benefits and challenges that are common to both. Instead we discuss relative differences between DMNCs and AMNCs cross-border acquisitions.

We first propose that DMNCs perform worse than AMNCs when acquiring firms in advanced economies because the institutional resources of DMNCs are not as well adapted for operating in advanced economies as those of AMNCs. DMNCs develop institutional resources appropriate for operating in their home countries and dealing with the challenging institutions and political conditions typical of developing countries (Djankov et al., 2002; Khanna and Palepu, 2010). Thus, for example, firms in developing countries establish tight political relationships with governments that have a large influence on the economy (Ghemawat and Khanna, 1998), invest in the creation of infrastructure that is not provided by the government (Fisman and Khanna, 2004), or engage in bribery to receive permits in order to operate (Svensson, 2005).

When they internationalize, DMNCs use these institutional resources to deal with the poor institutions in other developing countries to their advantage. For example, companies in politically risky countries are more adept at operating in other countries with political risk (Holburn and Zellner, 2010), firms that operate in countries with high government intervention are better at managing in other countries with high government intervention (Garcia-Canal and Guillen, 2009), or firms that face poor governance at home have an advantage in conducting business in countries with poor governance (Cuervo-Cazurra and Genc, 2008).

The DMNCs' advantage of managing in challenging countries, however, does not translate well to advanced economies. In advanced economies, the ease of contracting and the more transparent political system render the institutional resources of DMNCs inappropriate, and managers may bring behaviors that are ill suited for doing business in advanced economies. For example, Fisman and Miguel (2007) find that diplomats from corrupt countries are less likely to pay parking tickets in New York City because they are used to not having to pay them in their home country. In contrast, AMNCs have institutional capabilities created in their home country that enable them to operate well in other advanced countries with similar institutional conditions (Datta and Puia, 1995; Johanson and Vahlne, 1977).

As a result, we argue that, in comparison to AMNCs, DMNCs purchasing firms in advanced economies do not fare as well. Although it is challenging to integrate and manage the target firm and extract value from an acquisition (Puranam and Srikanth, 2007; Zollo and Singh, 2004), DMNCs may find it even more challenging because their managers lack the institutional resources and knowledge needed to operate in advanced countries. Their institutional knowledge is not as appropriate for advanced economies as that of AMNCs' managers, and in some cases, it may be counterproductive. We summarize these ideas in the following hypothesis:

Hypothesis 1a. In cross-border acquisitions, DMNC acquirers are likely to gain less than AMNC acquirers when purchasing target firms in advanced economies.

However, we also propose that DMNCs perform better than AMNCs when acquiring HIP target firms in advanced economies because these acquisitions enable DMNCs to solve the comparative technological disadvantage of their home countries and upgrade their home operations with the acquired technology; we call this the technology escape hypothesis.

The DMNC can escape the technological comparative disadvantages of its home country by acquiring a HIP firm in an advanced economy. As we mentioned before, firms in developing countries have a more limited technological sophistication because they operate in countries with

weaker innovation systems (Furman, Porter and Stern, 2002; Nelson, 1993), underdeveloped intermediaries and poor institutions (Khanna and Palepu, 2010), weak property rights (Quan and Chesbrough, 2010; Zhao, 2006), and lower levels of technological development (OECD, 2011; WIPO, 2011). The acquisition of a HIP company in an advanced economy enables the DMNC to access the more supporting innovation system of the advanced economy (Nelson, 1993). By establishing a presence in the advanced country, the firm can provide the necessary incentives and conditions that facilitate the transfer of knowledge across borders (Kogut and Zander, 1993) since, otherwise, knowledge is generally difficult to relocate across countries (Kogut, 1991). Additionally, the acquisition enables the DMNC to access sophisticated firm-specific resources (Anand and Delios, 2002). The control of the target firm facilitates the assimilation of sophisticated technology in a manner that could not be achieved via alliances (Hennart and Reddy, 1997).

These acquisitions not only help DMNCs escape their technological comparative disadvantage, but result in DMNCs performing better than AMNCs because they are able to extract more value from the same technological resources of the target. In other words, in terms of value extracted we argue that when buying HIP firms in advanced economies, DMNCs are mostly buying technological assets while AMNCs are buying assets with technologies in them, in Ahuja and Katila (2001) terms.

The reason is that, despite the differences across advanced countries in innovation systems (Patel and Pavitt, 1994), there is a larger technological gap between innovation systems in developing versus in advanced countries (Furman, Porter and Stern, 2002; OECD, 2011). As a result, DMNCs are exposed to fewer and less sophisticated technologies than AMNCs in their home countries and tend to have less advanced technological capabilities (Kumarawasmy et al., 2012).

For the DMNC, the HIP target firm provides sophisticated technologies as well as other technologies that although common among advanced country innovation systems might be relatively rare among developing country innovation systems. These technologies can be useful for improving the home operations even if they are common in the advanced economy because they are rarer in the developing country; the rareness of a resource is one of the defining basis of a competitive advantage (Barney, 1991). In other words, we argue that the DMNC can extract more value from the same target assets because it can use more of the target technologies to address its own technological gap. Moreover, it is easier for the DMNC to obtain value because its technological gap is larger, and thus, easier to bridge. Due to the larger technological gap, the initial return to the technology investment will be higher, whereas, with smaller gaps, the returns are diminishing; more basic technologies are easier to absorb within the firm than more sophisticated ones because basic technologies require less sophistication and investments in absorptive capacity (Cohen and Levinthal, 1989).

Additionally, the exposure to highly advanced technology in the advanced economy can extend the technological horizon of the DMNC, resulting in larger upgrading of know-how as the DMNC masters basic technologies and has the opportunity to continue adapting more advanced knowledge, eventually catching up to levels of international competitiveness (Kumarawasmy et al., 2012; Van den Bosch, Volberda and de Boer, 1999). The DMNC can use the HIP target firm as a learning source for its employees, rotating them at the target site in order to be exposed to the technological conditions of the advanced economy and benefitting from “brain circulation,” improving the technologies in the home country to reach the international technological frontier (Liu et al., 2010; Saxenian, 2006). Although some developing country firms may not fully

internalize the technologies, DMNCs are the best companies in the developing country (BCG, 2011; Economist, 2010) and they have firm-specific assets that enable them to achieve an advantage abroad (Hymer, 1976; Ramamurti, 2012); thus, they are more likely to be well positioned to use the sophisticated technology of the target firm and upgrade their home operations to international levels (Kumarawasmay et al., 2012).

In contrast, for the AMNC, the HIP target firm provides sophisticated technologies but at the same time, there are some target technologies to which the AMNC has already been exposed in its home country because advanced countries are likely to share commonalities in innovation systems. Thus, the value that the AMNC can extract from the acquisition of a HIP target firm is more limited because it is paying for target firm technologies it already has and does not need. After the acquisition, it will have to either dispose of the redundant assets if they can be separated from the target's other valuable assets and sold (Capron, 1999; Capron, Mitchell and Swaminathan, 2001). However, some assets such as knowledge embedded in employees, cannot be easily separated and sold, and must be written off as part of the cost of purchasing the target.

Thus, while it is likely that both AMNCs and DMNCs benefit from target assets that are valuable and less transferable across countries such as the distribution system and marketing infrastructure (Anand and Delios, 2002), or the international operations of the target firm to achieve a quick international exposure (Anand, Capron, and Mitchell, 2011), DMNCs can extract more value and more easily from the technological base of the acquired HIP target firm than the AMNC, which might end up paying for assets and technologies it already has. Hence, we propose that, in comparison to AMNC acquirers, DMNCs purchasing HIP firms in advanced economies fare relatively better because they obtain more technology needed to upgrade their home operations and solve the technological disadvantage of the home country. We summarize this technological escape hypothesis as follows:

Hypothesis 1b. In cross-border acquisitions, DMNC acquirers are likely to gain more than AMNC acquirers when purchasing high intellectual property target firms in advanced economies.

Hollowing out of Target Firms in Advanced Economies

In general, being acquired by another firm tends to be good for the target company (Hitt, Ireland and Harrison, 2001; Tuch and O'Sullivan, 2007). Acquirers tend to pay a premium over the current valuation of the firm (see Laamanen, 2007, for a review). Additionally, an acquisition may dislodge entrenched managers and replace them with an alternative managerial team with better value creating ideas (Fama and Jensen, 1983).

We argue that the target firm performs differently depending on who acquires it. Specifically, we propose that a target firm in an advanced country performs relatively worse when acquired by a DMNC than by an AMNC. Acquirers redeploy competitive capabilities to target firms they acquire (Bresnan, Birkinshaw and Nobel, 1999; Capron, Dussauge, and Mitchell, 1998; Capron and Hullan, 1999), and the competitive capabilities received from a DMNC acquirer may be less useful to a target firm in the advanced economy than the competitive capabilities received from an AMNC acquirer.

The competitive capabilities of the DMNC are more attuned for competing in developing countries, such as managing low cost employees with low levels of education efficiently, using production processes that succeed despite the weak infrastructure of developing countries, or creating products with simple technology that reduce the cost of operation to low-income consumers (Dawar and Frost, 1999; Prahalad and Mashelkar, 2010; Lall, 1983; Wells, 1983). Additionally, DMNCs also generate competitive capabilities for obtaining the support and

protection of the government against competition (Ghemawat and Khanna, 1998). These competitive capabilities, although valuable in the home as well as in other developing countries (Aggarwal and Agmon, 1990; Lall, 1983; Wells, 1983), may not be useful for using in an advanced economy target firm which has highly skilled and high-cost employees, serves highly demanding high-income customers, and competes in an industry in which the government offers limited support and protection from competition.

In contrast, AMNCs have competitive capabilities that are better adapted for competing in advanced economies (Mudambi, 2008). Thus, the AMNC acquirer may provide the target firm in the advanced economy with sophisticated competitive capabilities like innovations and technologies that help the target firm improve its competitive advantage (Bresnan, Birkinshaw and Nobel, 1999). Target firms benefit more when they share business similarities with the acquiring firm (Park and Ghauri, 2011). This differential in competitive capabilities transferred by DMNCs and AMNCs to target firms may explain why US target firms acquired by AMNCs tend to increase in labor productivity compared to those acquired by DMNCs (Chen, 2011).

In sum, we propose that target firms in advanced economies purchased by DMNCs do not benefit as much as target firms purchased by AMNCs because the competitive capabilities transferred from the DMNC acquirer are not as valuable in an advanced economy. These ideas and the previous discussion lead to the following hypothesis:

Hypothesis 2a. In cross-border acquisitions, target firms in advanced economies are likely to gain less when acquired by DMNCs than when acquired by AMNCs.

Moreover, we propose that HIP target firms perform even worse when acquired by DMNCs than when acquired by AMNCs, not just because DMNCs do not have the valuable competitive capabilities to transfer to the target firm, but because the DMNC may actually hollow out the target firm (Bloom and Grant, 2008; Tejima, 2000) more than an AMNC by extracting technology to improve its home operations and not being able to invest in replenishing these sophisticated knowledge assets in the target firm.

DMNCs' acquisitions of target firms in advanced economies have been argued to be designed as a source of advanced capabilities for the DMNC (Luo and Tung, 2007; Madhok and Keyhani, 2012). The acquirer transfers the sophisticated resources from the HIP target firm back to its home country to develop new capabilities there (Lin et al, 2009; Vermeulen and Barmeka, 2001; Very and Schweiger, 2001), thus, helping the DMNC overcome the technological disadvantage of coming from a developing country. This transfer of capabilities from the target to the acquirer can be detrimental to the target (Capron, 1999). The DMNC may take the advanced technologies of the target firm and transfer them to the home country to improve its operations (Madhok and Keyhani, 2012), not investing in the development of new sophisticated technologies in the target firm because it is unable to do so, or even closing down the operations of the target firm once it has extracted the capabilities it desired. For example, in 2003, the Yankuang Group, a coking company in Shandong Province, sent 400 Chinese workers to Germany who "dismantled the Kaiserstuhl coking plant in Dortmund, which had been built only a few years earlier to meet exacting European environmental standards" (Kahn and Landler, 2007). Although AMNCs may also use the HIP target to obtain advanced technologies, they may be able to continue supporting the creation of high technologies in the target better than DMNCs because AMNCs may have more compatible advanced technologies with the HIP target firm (Makri, Hitt, and Lane, 2010).

In sum, we propose that the DMNCs' extraction of technology from HIP target firms in advanced economies may result in their hollowing out (Kotabe, 1989; Tejima, 2000) more than if

they had been acquired by AMNCs, harming the future of the target firm. Hence, these ideas lead us to propose the hollowing out hypothesis that argues the following:

Hypothesis 2b. In cross-border acquisitions, HIP target firms in advanced economies are likely to gain less when acquired by DMNCs than when acquired by AMNCs.

RESEARCH DESIGN

Sample and Data

We test these two sets of hypotheses on a sample of cross-border M&As involving publicly traded firms in the period 1990-2009 around the world. Data on cross-border M&As come from SDC Platinum Global Mergers. We include all completed M&A deals between January 1, 1990 and December 31, 2009, in which the target firm is located in a different country than the acquiring firm or if the target ultimate parent company is in a different country than the acquirer ultimate parent company; hence, we exclude all domestic deals. Although SDC records acquisition information involving firms in the United States starting in 1980, for deals with firms in other countries, the data starts in 1990, which we use as starting date of our sample.

SDC provides information on deal specifics such as the value of acquisition, the share acquired as well as the financing method. For selected firms, SDC also offers financial accounting information such as operating profit, total sales, revenues, cost of goods sold and property, plant and equipment. These accounting variables are available up to five years prior to the acquisition announcement for a subset of target firms. However, for acquiring firms, they are only available in the year of the acquisition announcement.

We match publicly listed target and acquiring firms to their stock price returns in Datastream. Datastream also provides the equity market index for individual countries in our sample. After matching the data, the number of M&A used to test the hypotheses is 6,447 in the analysis of acquirer returns and 1,890 in the analysis of target returns.

Variables and Measures

We measure performance using acquirer and target stock price reactions based on standard event study methodology, which has been widely used for evaluating M&As in the literature (Andrade, Mitchell and Stafford, 2001; Aybar and Ficici, 2009; Chari, Ouimet and Tesar, 2010; Harris and Ravenscraft, 1991). We use weekly stock price data to compute cumulative abnormal returns (CARs) over the event window using a market model:

$$R_{it} = a_i + b_i R_{mt} + e_{it}.$$

The coefficients a_i and b_i are estimated for a given firm over a nine months interval starting 10 months prior to the acquisition announcement and ending 1 month before the announcement. The coefficients are then used to compute the weekly expected returns around the acquisition announcement. The abnormal return is defined as the difference between the actual return and the expected return in the event window. The market returns used in the estimation are the broadest market index available for a particular country. Acquirer and target returns are calculated in local currency.

Our main results are conducted using a three-week event window, which includes the week before, the week of, and the week after the announcement. Since we focus on a three week window around the announcement, we can observe target firms that later disappear as they become integrated in the acquirer; a longer window would not include such firms. Moreover, acquirers may undertake other actions in a longer window that could affect the abnormal returns.

Although there are shortcomings in using CARs in evaluating M&As, to date it remains the most commonly used performance metric in the literature. Essentially, CARs around the M&A announcement dates reflect the market's responses based on present expectations about

the future cash flows of a combined firm (Haleblian et al., 2009). Many scholars consider this metric to be the most effective technique to measure M&A performance, and existing literature has found that the market has some ability to predict post-acquisition performance (Asquith, 1983; Cornett & Tehranian, 1992; Healy et al., 1992; Kaplan & Weisback, 1992). One of the primary advantages to using short-window CARs is that changes in stock prices can be attributed to the M&A announcement with relative confidence by minimizing “noise” from other potentially confounding variables (Haleblian et al., 2009). Longer term performance metrics, such as accounting measures, might pose even more challenging problems such changes in product mix, investment decisions, and other actions that can be potentially exhibit confounding effects on firm performance.

We use a bivariate indicator of whether the country is developing or advanced to capture the country of origin of the acquirer, following previous research that classified countries into broad groups such as Gubbi et al. (2010) who separate countries into OECD and non-OECD or Cuervo-Cazurra and Genc (2008) who separate countries into advanced, developing and least developed. We use the classification of the International Monetary Fund to group countries into developed and advanced. Countries classified as developed by the IMF are the following: Australia, Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Malta, Netherlands, New Zealand, Norway, Portugal, Singapore, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and United States. Countries classified as developing are those that are not classified as advanced. We exclude target and acquirer destinations when the countries are considered to be tax haven according to OECD (2008), such as Bahamas or Cayman Islands. Unlike other classifications that use one indicator of development, such as the World Bank’s classification using GNI per capita (later we run a robustness test with this alternative classification), the IMF uses a composite of indicators and assessments to classify countries as advanced and developing.

The intellectual property (IP) measure of the target firm comes from the SDC database. In the database, intangible assets are defined as the value of assets having no physical existence, yet having substantial value to the firm, including goodwill, patents, trademarks, copyrights, franchises and costs in excess of net book value of businesses acquired.

To test whether DMNC acquirers perform better when acquiring IP targets in advanced economies, we include target IP and an interaction term between target IP and developing country acquirer indicator dummy. We repeat the regression analysis with target CARs as the dependent variable.

We control for several influences on cumulative abnormal returns. Value captured in an acquisition depends on a range of year-, industry-, and country-specific factors. Therefore, besides regressing acquirer CARs on an indicator dummy for whether the acquirer firm is a DMNC or AMNC, we also include various control variables for firm nation fixed effects, year fixed effects, and firm industry fixed effects. We also control for the size of the investment with a measure of investment in millions of US\$, and for the acquisition achieving majority control with a bivariate variable that takes the value of 1 if the acquirer holds 51% or more of the target firm’s equity following the acquisition.

Method of Analysis

We use OLS regression to test the hypotheses. We separate the sample into whether the target destination is located in a developed or developing country, which is equivalent to interacting the developing country acquirer dummy with all exogenous variables (for more

details about the approach see diGiovanni, 2005; Wooldridge, 2002). We run two models, one in which we analyze cumulative abnormal returns for acquirer firms to test hypotheses 1a and 1b, and another, in which we study cumulative abnormal returns for target firms in order to test hypotheses 2a and 2b. The general model we use to test hypotheses 1a and 1b is the following:

Acquirer Cumulative Abnormal returns = $a_0 + a_1 * \text{Developing country acquirer firm} + a_2 * \text{target firm intellectual property} + a_3 * \text{Developing country acquirer firm} * \text{target firm intellectual property} + a_i * \text{controls}_i + \text{ind}_i + \text{country}_i + \text{year}_t + e_{it}$

Hypothesis 1a is supported if in the analysis of acquirer firms the coefficient a_1 is negative and statistically significant on the sample of target firms in advanced economies. For hypothesis 1b to find support, we predict that the coefficient a_3 on the interaction term between developing country acquirer firm and target firm IP is positive and statistically significant only on the sample of target firms located in advanced economies.

To test for hypotheses 2a and 2b, we change the previous regression slightly by replacing the dependent variable with target cumulative abnormal returns, i.e.:

Target Cumulative Abnormal returns = $a_0 + a_1 * \text{Developing country acquirer firm} + a_2 * \text{target firm intellectual property} + a_3 * \text{Developing country acquirer firm} * \text{target firm intellectual property} + a_i * \text{controls}_i + \text{ind}_i + \text{country}_i + \text{year}_t + e_{it}$

Hypothesis 2a is supported if in the analysis of target firms the coefficient a_1 is negative and statistically significant on the sample of target firms in advanced economies. In order for hypothesis 2b to find support, we predict a negative and statistically significant coefficient a_3 on the interaction between developing country acquirer firm and target firm intellectual property on the sample of target firms located in advanced economies.

Before we discuss the results, we need to acknowledge some simplifications done in the research design to test the hypotheses. First, we are classifying countries into two types instead of analyzing the particularities of each country. This is an implicit method to contrast DMNCs to AMNCs and thus, test whether DMNCs follow the behavior of AMNCs; differences between these two sets of firms would support the idea that the study of DMNCs can yield new theoretical insights rather than merely yield a rediscovery of old theoretical arguments (Ramamurti, 2012). Second, we do not analyze integration challenges and the long-term implications of the acquisitions for acquirers and target firms. Instead, we focus on immediate market reaction to the announcement, market reactions that assess the likelihood of success but that do not actually measure the success in managing the acquisition, which may be captured with longer-term accounting measures. Third, our sample includes publicly-traded companies, which generally account for the majority of the largest firms in a country. These firms also represent a large share of firms conducting cross-border M&As and many of them are MNCs. However, they are not representative of the underlying populations of firms in the country, which includes many small and family-owned firms. Fourth, we are not measuring with precision some of the variables we discuss in the theory due to limitations in the dataset; this is a challenge common in many management studies that use secondary data.

RESULTS

Description of the Data

There are four possible combinations of acquirer and target firm pairings. The largest of the four groupings is the number of advanced country acquiring firms conducting M&As in other advanced countries. The second largest is advanced country firm acquirer and developing country target firms, followed by developing country acquirer and developing country target firms, and lastly, developing country acquirer purchasing advanced country target firms. The

developing countries with the largest number of outward M&A transactions in advanced countries are India, South Africa, China, and Russia and the most popular developing country target destination of advanced country acquirers are Brazil, China, India and Argentina. On the advanced country side, the countries with the largest number of outbound M&A investments are United States, United Kingdom and Germany, and the most popular destinations of developing country acquirers in advanced countries are United States, Australia, and United Kingdom.

Table 1 summarizes transaction specific information for all four types of deals. Several facts emerge: deals involving advanced country acquirers are larger in size measured by transaction value than deals involving developing country acquirers; market capitalization of acquirers going to advanced countries is higher than that of acquirers entering developing countries; the premium paid by advanced country acquirers is higher than that paid by developing country acquirers, and the median premium is higher for advanced country targets than that of developing country targets; advanced country acquirers pay more in terms of price over target book value than developing country acquirers, and advanced country targets have higher price over book value than developing country targets; and lastly, acquirer and target industries are fairly similar across the various types of cross-border M&As.

*** Insert Table 1 here ***

Table 2 provides an overview of target and acquirer financial characteristics. Whereas SDC provides information of firm financial variables for some targets up to 5 years prior to acquisition, the firm financial information for acquirer firms is only available for the year of the M&A announcement. For target firms, we provide summary statistics on target firms one year prior to the acquisition, and for acquirer firms, the financial characteristics are based on information during the year of the acquisition announcement. On average, DMNC acquirers pick advanced country targets with negative return on assets, and AMNC acquirers pick developing country targets with negative average return on assets; both types of acquirers select targets with higher average performance in their respective group. Target firms with the highest research and development (R&D) are located in advanced countries, with AMNC acquirers picking on average the targets with the highest R&D expenses out of all groups. DMNC acquirers pick targets with higher levels of long term debt than AMNC acquirers, with target firm debt levels particularly high in advanced countries. On the acquirer side, during the year of acquisition, DMNC acquirers are most profitable based on average return on assets. DMNC acquirers also have on average lower debt levels than AMNC acquirers.

*** Insert Table 2 here ***

Table 3 provides basic pairwise correlation coefficients among target financial variables and among acquirer financial variables. Target cumulative abnormal returns based on a three-week window, centered around the week of the announcement date is significantly and negatively correlated with the target being in a developing country. Acquirer cumulative abnormal returns do not seem to be statistically and significantly correlated with acquirer or target country of origin.

*** Insert Table 3 here ***

Test of Hypotheses

Table 4 presents the results for testing the hypotheses. Models 4.1 and 4.2 present the results of analyzing acquirer firm cumulative abnormal returns and Models 4.3, 4.4 present the results of analyzing target firm cumulative abnormal returns.

The results support hypotheses 1a and 1b. To test both hypotheses 1a and 1b, we perform regression analysis on the sample of target firms located in advanced economies (Model 4.1). We

run the same regression on the sample of only targets located in developing countries (Model 4.2) to provide additional evidence that the results are indeed relevant only when targets are located in developed countries rather than in developing countries. As Model 4.2 shows, the statistical significance on the coefficients of interest vanishes when applied only on the sample of target firms in developing countries. In each of the regressions, we control for acquirer country and industry fixed effects, acquisition year fixed effects, and size and majority control.

In other words, acquirers from developing countries experience lower cumulative abnormal returns than acquirers from advanced economies when purchasing target firms in advanced economies (Model 4.1, coefficient a_1), thus, establishing strong support for hypothesis 1a, which indicated that DMNCs benefit less than AMNCs when acquiring target firms in advanced economies because DMNCs lack the institutional resources to operate there. However, when a DMNC acquirer purchases a HIP target firm in an advanced economy, its stock market reaction is more positive than that of an AMNC acquirer (Model 4.1, coefficient a_3). This finding corroborates hypothesis 1b, the technological escape hypothesis, which indicated that DMNCs benefit more than AMNCs when acquiring HIP target firms in advanced economies because they solve the technological comparative disadvantage of coming from developing countries and are able to extract more value from the technologies than AMNCs. In contrast, the results do not hold up for the sample of targets in developing countries (Model 4.2), thus, highlighting the importance of destination and origin country of target and acquirer, respectively.

*** Insert Table 4 here ***

The results do not support hypotheses 2a and 2b. To test hypotheses 2a and 2b, we repeat the regression analysis using target cumulative abnormal returns as the dependent variable, analyzing subsamples of targets located in advanced economies (Model 4.3) and targets located in developing countries (Model 4.4). The coefficients of acquirer from developing country or of its interaction with target firm IP are not statistically different from zero. Thus although HIP targets tend to be accompanied by more negative returns, they do not systematically differ between DMNC and AMNC acquirers or target type of destinations. In other words, we do not find support for the DMNCs' hollowing out hypothesis. DMNCs are not different from AMNCs in their hollowing out of HIP target firms. HIP target firms in advanced economies appear to suffer a general hollowing out when acquired, regardless of the country of origin of the acquirer.

One reason could be that HIP target firms are not being hollowed out by the DMNC acquirer but rather because target employees decide to leave the firm after the acquisition taken with them the tacit knowledge needed to use the technology. Managing HIP target firms is more challenging than managing targets in general because the tacit components of technology are embedded in personnel (Nonaka, 1994). In the post-acquisition restructuring process, integration of different cultures and practices can create a time of upheaval as the acquiring company seeks assimilation and cost synergies. Managers that have been integral in maintaining and advancing IP in the target firm might have negotiated lucrative deals as part of the acquisition package (Krug and Shill, 2008). Despite these bonuses, however, there always remain disincentives from staying with the new regime due to culture clash, control and altered advancement opportunities (Rafferty and Restubog, 2010).

Robustness Checks

We performed additional analyses, available upon request, to ensure that the results are robust to alternative explanations¹. First, since country classification plays a crucial role in our analyses, we want to make sure that the results are robust to alternative ways of classifying

¹ We thank two anonymous referees for suggesting these additional tests.

developing vs. developed countries. Whereas the results in the main section are based on the classification by the IMF, we also conduct the same regressions using a classification established by the World Bank.² The main criteria of classification for the World Bank is the Gross National Income per capita measure based on 1987 price levels. The IMF classification, on the other hand, is not explicit and is comprised of many different variables based on the economic and financial data that the Fund collects from its member countries. Thus, the World Bank measure is considered to be a more absolute type of development threshold compared to the IMF classification (Nielsen, 2011). The World Bank classifies a larger share of countries as "advanced" compared to the IMF (26 percent vs. 17 percent in 2010, respectively, Nielsen, 2011). Despite the alternative classification, the results are very similar, both in magnitude as well as in statistical significance to the ones presented here, supporting H1a and H1b.

Second, in our theoretical discussion, we alluded to the fact that developing acquirers are out to buy IP in the target such as brand and technology. Since targets in developed markets might have better brands and technologies, they often come at a higher price. Therefore, as a robustness check, we regressed the offer premium, measured as offer price to book value, on the same set of variables that we used for the test of hypotheses. The results of this analysis are similar to the main set of results, in addition, they also indicate that DMNC acquirers generally pay less for IP than AMNC acquirers.

Third, acquirers may differ in their ability to incorporate the IP of the target firms. To account for some relevant acquirer characteristics that may influence this, we run a model in which we controlled for acquirer firm IP assets, total assets, and their performance using EBITDA. Unfortunately, the inclusion of these variables reduced the number of firms analyzed, and we lack reliable information on other variables. The results of these analyses provide support for H1a and H1b, in line with the results presented here.

CONCLUSIONS

We analyzed differences in performance of cross-border M&As conducted by DMNCs and AMNCs. We introduced the technological escape hypothesis, in which we proposed that DMNCs escape the weak innovation systems of their countries of origin by purchasing HIP firms in advanced economies. Thus, we argued that although DMNC acquirers suffer inferior performance than AMNC acquirers when they buy firms in advanced economies, because they are more likely to lack the institutional capabilities needed to manage in advanced economies, DMNCs enjoy relatively superior performance when they buy HIP firms in advanced economies, because they obtain sophisticated technologies that solve their technological comparative disadvantages. We also discussed the hollowing out hypothesis. First we explained that target firms purchased by DMNCs in advanced economies have inferior performance than target firms purchased by AMNCs, because DMNCs do not transfer appropriate competitive capabilities to the targets as AMNCs would. We then argued that HIP target firms in advanced economies purchased by DMNCs have even more inferior performance than target firms in advanced economies purchased by AMNCs because DMNCs extract their advanced technologies and do not invest in replenishing them, eventually hollowing them out.

The results of the empirical analysis support the technological escape hypothesis but not the hollowing out hypothesis. Specifically, the findings indicate that, although DMNC acquirers have lower performance in comparison to AMNC acquirers when purchasing target firms in advanced economies, DMNC acquirers have relatively higher performance when purchasing HIP

² The World Bank classification can be found under: <http://data.worldbank.org/about/country-classifications/a-short-history>

target firms in advanced economies. Furthermore, target firms purchased by DMNCs in advanced economies compared to target firms purchased by AMNCs do not lose from being acquired by DMNCs, but HIP target firms in advanced economies have inferior performance regardless of the acquirer firm country of origin; if there is a hollowing out, this happens with all acquirers, not just DMNCs.

These arguments and findings are important contributions to two strands of the literature. First, the arguments contribute to a better understanding of differences between DMNCs and AMNCs, complementing other studies on the topic (Cuervo-Cazurra and Genc, 2008; Rangan and Drummond, 1994; Tallman, 1991). The emergence of DMNCs as large investors and in some cases as leaders in their industries is giving rise to a burgeoning literature that tries to understand how these firms differ from AMNCs (Guillen and Garcia-Canal, 2009; Luo and Tung, 2007; Ramamurti, 2012). Previous studies of DMNCs' cross-border acquisitions do not include AMNCs in their analyses and limit their focus to either the acquirer or target (e.g., Aybar and Ficici, 2009; Chari, Chen and Dominguez, 2012; Chari, Ouimet and Tesar, 2004; Deng, 2009; Gubbi *et al.*, 2010; Knoerich, 2010; Maihotra, Sivakumar and Zhu, 2009; Rui and Yip, 2008) and thus, are unable to establish whether the findings apply to all acquisitions or only the ones they study (with exceptions like Chen, 2011, and Hope, Thomas and Vyas, 2011). We have highlighted that in the realm of cross-border acquisitions, DMNCs and AMNCs differ when purchasing target firms in advanced economies, while they follow similar behavior when acquiring firms elsewhere. Our findings help identify behaviors of DMNCs that are truly unique to them due to their country of origin and differentiate them from those that are common to DMNCs and AMNCs (Ramamurti, 2012).

Second, we also contribute to a better understanding of how the conditions of the country of origin affect the internationalization of the firm (Meyer et al, 2009; Peng, Wang and Jiang, 2008). One strand of the literature has highlighted how firms that learn to deal with challenging conditions in the home country, such as political risk (Holburn and Zelner, 2010), government intervention in the economy (Guillen and Garcia-Canal, 2009), pro-market reforms (del Sol and Kogan, 2007), or poor governance (Cuervo-Cazurra and Genc, 2008) are better placed to invest and operate in other countries that have similar challenging conditions. Another strand of the literature has indicated that firms facing challenging conditions at home, such as poor governance (Coffee, 2002) and poor institutions (Witt and Lewin, 2007), invest in countries with better conditions to escape the detrimental conditions of the home country, i.e., an institutional escape.

Drawing on these lines of thinking, we introduced the technological escape hypothesis, whereby DMNCs purchase firms in advanced economies to solve the technological comparative disadvantage of their home countries. Although proposing a similar action, i.e., escape from developing to advanced economies, the underlying argumentations of the institutional and technological escapes differ. The technological escape enables the firm to improve its competitive advantage by approaching the technological frontier, thus, strengthening its competitiveness against AMNCs. The DMNC obtains technologies that complement and improve its technological base, moving from competing abroad on the basis of the comparative advantage of the country of origin in low cost factors of production (Rugman, 2010) toward competing abroad on the basis of technological advancement and innovation (Kumaraswamy et al., 2012; Mudambi, 2008; Vernon, 1966). In contrast, the institutional escape enables the firm to reduce the cost of contractual relationships by operating in an institutional system that protects contracts (Coffee, 2002). As such, it does not enable the firm to achieve a competitive advantage

per se but rather to reduce the competitive disadvantage of operating in a country with contractual uncertainty and low protection of property rights.

Future research can go deeper into these ideas, looking at other types of escape by DMNCs, like regulatory escape and the phenomenon of round tripping investment, whereby DMNCs invest abroad to create a base for investing in the home country as a foreign investor, reaping benefits available to foreign investors (Xiao, 2004), or consumer bias escape, whereby the DMNC invests in an advanced country for completion of certain products and thereby, claiming a different country of origin and avoid consumer ethnocentrism (Shimp and Sharma, 1987). These alternative escape motives differ not only in terms of the dimension of the environment that drive the escape, but also, and more importantly, in terms of the impact on the competitive advantage of the firm, with some types of escape solving comparative disadvantages while others, additionally, providing a competitive advantage to the firm.

The paper is useful to decision makers. First, the paper is informative for managers of DMNCs because it explains the conditions under which their firms are more likely to benefit from cross-border acquisitions. Managers of DMNCs should focus on acquiring HIP target firms in advanced economies and not just target firms in advanced economies to ensure that their firms solve their technological comparative disadvantages. It is the access to the firm-specific sophisticated technology in addition to the access to the country-level system of innovation that helps DMNCs upgrade their capabilities and benefit from cross-border acquisitions. Second, the paper is also useful for policymakers in advanced economies because it warns against an emerging perception that target firms are hollowed out by DMNC acquirers (Bloom and Grant, 2008); we find no evidence of such behavior. Hence, calls in political circles in advanced economies for selective refusal of acquisitions by DMNCs, in particular, need to be carefully reconsidered, since the market does not expect a nefarious impact on target firms at the time of acquisition.

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Table 1. Summary Statistics: Firm and Transaction Characteristics

	Developing country acquirer and advanced country targets	Developing country acquirer and developing country targets	Advanced country acquirer and advanced country targets	Advanced country acquirer and developing country targets
<i>Firm and Deal Characteristics</i>				
Median Transaction Size (\$M)	15.00	10.82	20.00	16.68
Median Acquirer Market Capitalization	169.50	93.25	164.40	122.50
Majority Control	0.72	0.71	0.87	0.70
Private Target	0.39	0.36	0.43	0.45
Private Acquirer	0.28	0.24	0.24	0.23
Target CAR	0.10	0.05	0.11	0.03
Acquirer CAR	0.01	0.003	0.01	0.003
Median Premium	15.05	8.11	24.17	17.86
Median Price over Book Value	1.96	1.86	2.48	2.18
<i>Acquirer Industry (%)</i>				
Investment & Commodity Firms, Dealers, Ex Business Services	24.76	26.37	16.9	17.33
Electronic and Electrical Equipment	9.48	6.11	11.11	7.65
Prepackaged Software	5.76	2.82	3.12	3.34
Metal and Metal Products	4.04	1.22	4.02	2.01
Mining	3.92	2.87	2.96	2.55
Food and Kindred Products	3.49	2.00	1.82	5.59
Oil and Gas; Petroleum Refining	2.98	5.35	3.45	6.05
Transportation and Shipping	2.98	3.78	2.71	4.06
Real Estate; Mortgage Bankers and Broke	2.64	2.56	2.59	2.22
	2.53	3.44	1.50	0.92
<i>Target Industry (%)</i>				
Investment & Commodity Firms, Dealers, Ex Business Services	4.63	9.59	4.01	4.73
Electronic and Electrical Equipment	11.36	8.09	13.88	9.58
Prepackaged Software	5.44	3.17	3.30	3.22
Metal and Metal Products	5.09	1.68	5.12	2.10
Mining	3.40	3.38	3.38	3.20
Food and Kindred Products	6.77	2.97	2.23	6.26
Oil and Gas; Petroleum Refining	3.37	6.10	3.63	6.56
Transportation and Shipping	3.35	4.11	2.89	4.44
Real Estate; Mortgage Bankers and Broke	3.24	3.48	3.10	2.87
	3.37	4.20	3.02	2.06

Notes: The table summarizes the sample of completed cross-border M&A transactions announced between 1990 and 2009. Buy-and-hold returns are estimated using a 3 day event window and using US\$-denominated returns. Majority control is a dummy variables that denotes whether the acquirer holds 50% or more of the target firm's equity following the acquisition.

Table 2. Acquirer and Target Firm Financial Characteristics

	Developing country acquirer and advanced country targets	Developing country acquirer and developing country targets	Advanced country acquirer and advanced country targets	Advanced country acquirer and developing country targets
Average Target Firm Characteristics in year of acquisition announcement				
Return on Assets (%)	-20.580	6.076	0.199	-27.280
Total Assets (\$M)	13438.330	3508.366	12965.570	2536.102
Revenues (\$M)	92641.430	3044.723	18450.240	198615.300
Net Income (\$M)	8.950	-15.099	57.160	-14.952
Plant, Property, Equipment (\$M)	93.295	2354.602	7030.554	784.489
EBITDA (\$M)	14.654	427.932	1231.557	211.735
R&D Expenses (\$M)	17.507	8.067	34.667	13.689
IP Assets (\$M)	68.092	38.046	71.376	54.307
Total Liabilities (\$M)	14807.530	2770.698	12339.220	4862.644
Total Long Term Debt (\$M)	2803.244	616.507	516.836	478.825
Capital Expenditure (\$M)	42.460	40.544	54.695	58.753
Average Acquirer Firm Characteristics in year of acquisition announcement				
Return on Assets (%)	30.575	7.244	3.480	-4.715
Total Assets (\$M)	14239.750	6199.706	39684.410	121998.900
Revenues (\$M)	4342.026	579.794	3669.812	9603.269
Net Income (\$M)	160.190	81.475	98.440	143.328
Plant, Property, Equipment (\$M)	166.516	170.685	179.257	228.089
EBITA (\$M)	123.260	106.654	156.434	216.240
IP Assets (\$M)	78.628	82.663	160.959	208.671
Total Liabilities (\$M)	9317.966	4040.636	30520.460	97659.850
Total Long Term Debt (\$M)	64.242	83.019	594.619	112.580

Note: The table summarizes the financial characteristics of target firms one year prior to the acquisition announcement year and those of acquirer firms in the year of the acquisition announcement. Return on Assets is calculated as Operating Profit (EBITDA)/Total Assets. All values except for return on assets are in millions of dollars.

Table 3. Correlation Matrix of Firm Characteristics

	Acquirer cumulative abnormal returns	Target cumulative abnormal returns	Acquirer from developing country	Target located in developing country	Target IP assets	Investment size	Majority control
Acquirer cumulative abnormal returns	1						
Target cumulative abnormal returns	0.117	1					
Acquirer from developing country	-0.011	-0.034	1				
Target located in developing country	-0.011	-0.117	0.359	1			
Target IP assets	-0.034	-0.020	0.005	-0.047	1		
Investment size	0.004	0.093	-0.048	-0.089	0.409	1	
Majority control	0.022	0.183	-0.066	-0.203	-0.100	0.086	1

Notes: The table displays the pairwise correlation coefficients of our variables of interest. All coefficients in bold indicate significance level at 1%.

Table 4. Regression analysis of acquirer and target cumulative abnormal returns

	Dependent variable: Acquirer cumulative abnormal returns		Dependent variable: Target cumulative abnormal returns	
	Targets in advanced economies	Targets in developing countries	Targets in advanced economies	Targets in developing countries
	Model 4.1	Model 4.2	Model 4.3	Model 4.4
Acquirer from developing country	-0.292*** (0.076)	0.182 (0.255)	-0.08 (0.061)	-0.099 (0.136)
Target IP assets *Acquirer from developing country	0.035** (0.017)	-0.015 (0.048)	0.025 (0.018)	0.028 (0.037)
Target IP assets	-0.002 (0.004)	0.002 (0.007)	-0.019*** (0.007)	-0.008 (0.012)
Investment size	-0.006 (0.005)	0.011 (0.012)	0.013 (0.008)	0.011 (0.017)
Majority control	0.027 (0.016)	0.062 (0.062)	0.007 (0.028)	-0.001 (0.089)
Year fixed effects	Included	Included	Included	Included
Nation fixed effects	Included	Included	Included	Included
Industry fixed effects	Included	Included	Included	Included
Constant	0.123 (0.083)	0.233 (0.143)	0.07 (0.271)	-0.312 (0.314)
F statistic	1.63	0.81	1.26	0.91
Adjusted R-squared	0.138	-0.129	0.032	-0.043

Note: Standard deviations appear in parentheses. Year, nation and industry fixed effects controls are included in all models, but not reported for space considerations.

Significance levels: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$