

**A DOUBLE-EDGED SWORD? THE ANTIPODAL EFFECTS OF
INSTITUTIONAL DISTANCE ON PARTNER SELECTION IN CROSS-BORDER
ALLIANCES**

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Abstract

Careful partner selection is a prerequisite for successful alliances. I posit that institutional distance will influence partner selection in international technological alliances negatively for exploitation, and positively for exploration alliances. A longitudinal dataset of firms in the global tire industry confirms firms' preference for similar cognitive, normative, and regulatory partners in exploitation alliances, and a preference for dissimilar partners in exploration alliances. However, the latter is true for differences across the regulative and cognitive pillars rather than for normative differences. These findings attest to the antipodal role of institutional differences in the selection of prospective partners for cross-border technological alliances.

A DOUBLE-EDGED SWORD? THE ANTIPODAL EFFECTS OF INSTITUTIONAL DISTANCE ON PARTNER SELECTION IN CROSS-BORDER ALLIANCES

INTRODUCTION

Technological alliances have become a popular strategy over the last decades (Gulati, 1995a; Anand & Khanna, 2000; Rothaermel & Boeker, 2008). Firms form explorative and exploitative alliances (Lavie & Rosenkopf, 2006; Sarala, Junni, Cooper & Tarba, 2014) to access complementary technologies (Prahalad & Hamel, 1990), reduce uncertainty (Burgers, Hill & Kim, 1993), enter new markets (García-Canal, Valdés-Llaneza, & Sánchez-Lorda, 2008), spur performance (Yamakawa, Yang & Lin, 2011), or improve their strategic options (Weber & Tarba, 2014). However, as firms rush to leverage these benefits, they often ignore potential losses from alliance mismatches (Ireland, Hitt & Vaidyanath, 2002) that ultimately result in high failure rates (Park & Ungson, 1997; Kale, Dyer & Singh, 2002). To avoid such outcomes, firms must carefully select their partners (Shah & Swaminathan, 2008), especially in international settings (Dacin, Hitt & Levitas, 1997; Dong & Glaister, 2006).

Employing elements from transaction costs economics (TCE) and resource-based theory (RBV), prior studies show that successful selection of alliance partners depends on the complementarity between them in terms of characteristics and resources (Hitt et al., 2000; Hitt et al., 2004; Rothaermel & Boeker, 2008). Others suggest that, despite this need for complementarity, partners must share compatible skills, routines, and strategies for the alliance to function well (Dacin et al., 1997; Glaister, 1996). Besides the individual characteristics of partnering firms, alliances are also subject to agency problems arising from misalignment of partners' goals (Eisenhardt, 1989), separation of ownership and control mechanisms (Reuer & Ragozzino, 2006) and project-specific behavior of partners (Shah & Swaminathan, 2008). Thus, the uncertainty firms

face (Beckman, Haunschild & Philips, 2004), level of mutual trust (Gulati, 1995a; Anand & Khanna, 2000), social and strategic interdependence (Gulati, 1995b), product and technological relatedness (Krammer, 2016), as well as prior commitments to the alliance (Mohr & Spekman, 1994) have all important implications for the selections of partners.

In addition to the above firm-specifics, the selection of alliance partners in an international context needs to overcome idiosyncratic differences between countries stemming from economic, political, legislative, and social factors (Hitt et al., 2000; Parkhe, 2003). Firm behavior does not occur in an organizational vacuum (Dacin, Ventresca & Beal, 1999) but is rather nested in the institutional environment in which it operates (Brouthers & Brouthers, 2000; Meyer et al., 2009; Ambos & Håkanson, 2014; Krammer, Strange, & Lashitew, 2018). As a result, institutional distance between home and host country plays an important role in determining different elements of MNE strategy, such as entry modes (Lu, 2002), staffing (Gaur, Delios & Singh, 2007), inter-firm collaborations (Park & Ungson, 1997) or export activities (He, Brouthers & Filatotchev, 2013).

Given the existing institutional heterogeneity worldwide (Meyer et al., 2009), it is important to understand how institutional distance affects MNE's selection of strategic partners (Hitt et al., 2005). However, with few exceptions, this issue has yet to receive significant attention in the literature. For example, Hitt et al. (2000) identify significant differences in competences sought from foreign partners between firms from emerging (i.e., financial resources, assets, technologies) and developed economies (i.e., unique competences, local market knowledge). Moreover, Hitt et al. (2004) point out that institutional differences are important even among emerging economies themselves, and contrast their effects on the partnering preferences of Chinese versus Russian managers. These inherent differences are confirmed by more recent studies focusing on the Indian (Chand & Katou, 2012) and Chinese subnational contexts (Ahlstrom et al., 2014). Finally, Roy & Oliver (2009) show that the selection of foreign partners is contingent on the host-countries' regulatory environments, such as the rule of law or control of corruption. While all these studies

provide important foundations for understanding the role of institutions in the selection of alliance partners, they also exhibit important limitations in terms of generality and scope by being confined to few countries and/or single institutional dimensions that fail to capture compellingly the considerable institutional heterogeneity across the world (Hitt et al., 2004) and its subsequent effects on different types of inter-firm alliances (Kale & Singh, 2009).

In response to these challenges, I explore partner selection for alliances through the lens of TCE theory (Gulati & Singh, 1998), supplemented by institutional (Kostova, 1999) and learning (Grant & Baden-Fuller, 2004) rationales. Once a firm identifies a pool of possible international partners that are committed, compatible and complementary, it must decide which one(s) to actually partner with, and I contend that, in addition to firm-specific factors, country-specific rationales will also play an important role in this process (Parkhe, 1991). Specifically, I propose that firms seeking exploitation will prefer partners from closer cognitive and normative environments and similar or superior regulatory ones, given coordination concerns, absorptive capacity issues, and appropriation risks that can affect the transfer of technologies and the potential for rents from these alliances (Gulati & Singh, 1998; Michailova & Hutchings, 2006; Delerue & Simon, 2009; Belderbos, Jacob, & Lokshin, 2018). In turn, I suggest that institutional distance will relate positively to selection of partners for exploration, given the increased opportunities for learning, cross-feeding, pooling of resources, institutional arbitrage, and lower risks of leakages (Gimeno, 2004; Noteboom et al., 2007; Nathan & Lee, 2013).

These hypotheses are tested using a hand-collected dataset that covers all firms in the global tire industry and their alliances between 1985 and 2003. Following previous studies in this area, I focus on horizontal agreements (Mowery et al., 2002; Lavie & Rosenkopf, 2006) for both theoretical clarity (Phelps, 2010) and consistency with the particularities of this industry, in which technological alliances occur almost exclusively between tire producers (Acha & Brusoni, 2005).

The results of the empirical analysis broadly support my conjectures regarding the antipodal effects of institutional distance on the selection of international alliance partners.

Accordingly, this work proposes several contributions. First, it advances the alliance literature by theorizing and testing the importance of environmental contingencies, in this case of institutional nature, in the process of partner selection. While most prior studies on the selection process have paid significant attention to the firm-specific contingencies (Shah & Swaminathan, 2008; Yamakawa et al., 2011; Weber & Tarba, 2014), our knowledge on the mechanisms through which external environments may affect these choices is still very limited, particularly in terms of generality and international scope (Ahlstrom et al., 2014). By examining how different institutional environments affect the selection of partners in a truly global context (i.e., numerous home and home countries), it offers more comprehensive explanations for this phenomenon that advance significantly this stream of literature (Hitt et al., 2000; Hitt et al., 2004; Roy & Oliver, 2009).

The second contribution is to examine the process of partner selection by focusing on learning objectives of the alliance as an important inducement of this process. In doing so, I distinguish between exploitation alliances, which involve the use of technologies already known (March, 1991), and explorative ones that aim to develop new technologies or competences for securing new strategic opportunities (Koza & Lewin, 1998). Given these fundamental differences, my theoretical arguments suggest that institutional distance will have antipodal effects on the appeal of partners for exploitative versus explorative interactions. Together these insights extend TCE theory by expounding mechanisms through which the institutional background of prospective partners may become either a benefit or a liability for a technological alliance, contingent on the latter's learning objectives.

Third, I differentiate the concomitant effects of several institutional pillars on partnering decisions, given their different, yet complementary, nature (Scott, 2001). Exploitation of technological assets via alliances involves unidirectional transfer of technology from one (focal)

firm to its partner(s); as such, it is sensitive to normative (Steensma et al., 2000), regulatory (Oxley, 1999) and cognitive (Kelly, Schaan & Joncas, 2002) differences between partners, which may entail additional costs or opportunities for such alliance. In contrast, institutionally-distant partners will be more appealing for exploration given firms' need to diversify and complement each other's knowledge (Schildt et al., 2005). The empirical results broadly support these antipodal effects of different institutional pillars on selection of partners for exploitation versus exploration alliances, with the exception of differences in terms normative institutions, which appear to hinder both types of endeavors. Consequently, these results support the idea of complex interactions between institutions and firm strategies across different institutional pillars, and advance our knowledge on these issues by proposing and testing the "double-edged sword" effect of institutional distance on partner selection for alliances.

BACKGROUND AND THEORY

A central issue for alliance formation is the quest for a suitable partner (Gulati, 1995a; Gulati, 1995b; Hitt et al., 2000). Surveys confirm that most managers see partner selection as the most important factor for alliance success, one that firms should continuously perfect if they are to improve the outcome of their alliances (Glaister, 1996). Whereas a thorough selection procedure involves careful screening and a commitment of substantial resources, it pays major dividends in terms of improving the flow of knowledge, resource and skills into and within the alliance, thereby meaningfully increasing the ability of firms to meet their strategic objectives (Geringer, 1991).

While firm-specific factors (e.g., complementarity, compatibility, trust, strategic interdependence, relatedness) present important explanations for a successful selection of alliance partners, in international transactions, country-specific factors (e.g., differences in economic development, governmental policies) exacerbate the repercussions of a potential mismatch (Dacin

et al., 1997; Parkhe, 2003; Dong & Glaister, 2006). Among them, institutional characteristics have been found to be particularly relevant for MNE strategies (Brouthers & Brouthers, 2000; Kostova & Zaheer, 1999; Meyer et al., 2009), however such factors have rarely been studied in conjunction with partner selection, let alone in relation to different alliance types in terms of objectives and underlying requirements.

Exploitation and Exploration in Alliances

Strategic alliances are often formed with the primary purpose of acquiring (i.e., learning and absorbing) or providing (e.g., licensing or exchanging) knowledge to partnering firms (Grant & Baden-Fuller, 2004). Following March (1991), I distinguish between explorative and exploitative knowledge quests and consider their respective alliance ramifications.

Explorative knowledge involves intense search, high risk, discovery, and the pursuit of novelty. It usually takes the organization away from its established and comfortable knowledge base, which is expressed in its structure and routines, into new domains and uncharted territory. For the firm, exploration holds the promise of long term survival and prosperity, while incurring higher costs and a more risk in the short term (Levinthal & March, 1993). Missing on essential tacit knowledge, a firm that undertakes an exploratory search has to look outside its boundaries and beyond its traditional environmental confines; an alliance partner possessing diverse tacit knowledge is likely a suitable source for such knowledge needs (Schildt, Maula & Keil, 2005, Phelps, 2010; Krammer, 2016).

In contrast, exploitation triggers a knowledge search that is much more routine, i.e. planned, structured and programmed. This type of search is more focused on process implementation and execution rather than on creating something new. Subsequently, the return on investment for exploitation, at least in the short term, tends to be more certain and visible, with the promise of

steady and predictable, if modest, gains (March, 1991). Given these features, proximity, relative similarity and ease of coordination will facilitate the efficient knowledge and coordination and execution of exploitative endeavors (Levinthal & March, 1991; Koza & Lewin, 1998).

The distinction between explorative and exploitative learning has been applied to strategic alliances (e.g., Koza & Lewin, 1998), in particular in technology intensive industries where learning and technology attainment are key formation objectives. Thus, alliances have been classified according to their primary purpose for a focal firm, based on whether the knowledge sought from a partner is new, or external to a firm, or is rather intended to leverage and or extend the utilization of existing knowledge assets and competencies (Lavie & Rosenkopft, 2006; Yamakawa et al., 2011; Sarala et al., 2014; Krammer, 2016). Despite these advances, prior research has not sufficiently explained how the choice of alliance partners may differ in an exploratory versus exploitative setting and the effects of institutional environments in which alliance partners are embedded. These caveats are important because they are intertwined with the strategic objectives of the partners and form a pivotal link between firms and their macro-environment (Grant & Baden-Fuller, 2004).

Institutional distance and selection of international partners for alliances

Differences in terms of institutional arrangements across countries can both benefit and impede MNE activities abroad. On one hand, these differences present opportunities for institutional arbitrage, encouraging exploitation of different capabilities across countries and institutional regimes (Gaur & Lu, 2007; Krammer, 2017; Krammer et al., 2018). On the other, institutional differences contribute to the liability of foreignness faced by the MNEs in the form of unfamiliarity, relational and discriminatory hazards that require additional costs of adaptation to foreign host environments (Eden & Miller, 2004). As a result, institutional distance between home

and host countries is a good predictor for MNE's strategies in different host markets (Henisz & Swami Nathan, 2008).

Concerning partner selection, the impact of institutional distance has received relatively little attention, and existing contributions have been confined to few countries and single institutional dimensions (Hitt et al. 2000; Hitt et al. 2004; Roy & Oliver 2009; Shi et al., 2012). Nevertheless, institutional complexity requires a complete examination of all dimensions (i.e., cognitive, normative and regulatory) given their potentially different effects and magnitudes on various MNE activities. Furthermore, exploitation and exploration through strategic alliances are likely to be affected differently by institutional differences between partners.

Whereas the bulk of the literature views differences in culture and institutions as detrimental to cross-border business (Stahl & Tung, 2014), scholars (e.g., Parkhe, 1991) have pointed out that such differences can also be beneficial. Some suggestions have been made as to when differences were likely to produce a benefit or a handicap, however those proposals have centered on the differences in each set of features, and their complementarity or conflict potential (Shenkar & Zeira, 1992). Still, studies have not dwelled on how institutional differences matter to different types of alliances based on their strategic learning aims, in this case, on how exploration versus exploitation might produce a different impact for institutional gaps. Therefore, our understanding of these issues could be improved by focusing on the three pillars of institutional distance proposed by Kostova (1999) –i.e., cognitive, normative and regulatory- and distinguishing between these two central types of alliances (March, 1991). In this way, this study can provide a more comprehensive answer regarding the effects of different institutional factors on partner selection, and their relative importance for MNEs seeking technological allies.

My starting point is that explorative and exploitative alliances are fundamentally different in nature and should therefore relate differentially to institutional differences between prospective

partners. Institutional differences can be identified across three areas, often referred to as institutional “pillars” (Scott, 2001). The first two (i.e., *normative* and *cognitive*) pillars capture tacit and informal aspects that describe how societal actors operate in a certain environment (Gaur et al., 2007). Normative aspects describe legitimate ways to achieve goals (Scott, 2001), while cognitive aspects reflect different schemas, frames, beliefs and inferences on how the world operates (Kostova, 1999). Both reflect institutional aspects that are deeply embedded in the normal functioning of a society. Thus, firms’ actions are highly representative of their home normative-cognitive environments since they often abide and implement these rules unconsciously (He et al., 2013).

Nevertheless, given their similarity and overlap, distinguishing between cognitive and normative aspects of institutions in practice is a daunting task (Scott, 2001). The cognitive dimension is commonly identified with cultural values and beliefs (Estrin et al., 2009; Bae & Salomon, 2010; He et al., 2013). Defined as the “collective programming of the mind” that identifies different groups of people, national culture provides a common frame for individuals to relate to organizations, the environment, and their peers (Hofstede, 1980). In turn, the normative dimension has been closely linked to the development of professional standards and educational curricula, and previous studies have conceptualized it using measures of managerial abilities, norms and practice (Delios & Beamish, 1999; Xu et al., 2004; He et al., 2013). Thus, I focus on the potential mismatch in terms of managerial norms and cultural values as two cognitive-normative elements that are relevant for the selection of alliance partners. Moreover, I consider cognitive (cultural) and normative (managerial) distance between partners to be *symmetric* and *dyadic* in nature (Zaheer, Schomaker, & Nachum, 2012), enabling me to assess the extent of differences between partners, however without being able to rank them.

The third (i.e., *regulatory*) component of the institutional environment includes codified rules that govern economic interactions (North, 1990). These formal institutional components (i.e. laws, regulations, policies) vary significantly across countries, and affect all inter-firm international interactions (Xu & Shenkar, 2002). Out of many potential institutional elements to be considered, I focus on a specific regulatory aspect, namely *intellectual property rights* (IPR). IPR are commonly defined as the exclusive rights given to a creator or inventor over the use of it over a limited period of time. Prior studies have shown that IPR regulations are intrinsically linked to innovation performance (Bekkers, Duysters, & Verspagen, 2002; Krammer, 2009; Cockburn, Lanjouw & Schankerman, 2016), commercial ability (Arora, Fosfuri & Gambardella, 2001), ability to capture rents (Khoury & Peng, 2011), and firm strategies and governance of technological assets and relationships (Zhao, 2006; Hagedoorn & Hesen, 2007). Thus, given this cardinal influence of IPR on technological aspects, I argue that regulatory differences in terms of IPR will influence partner selection in international alliances with a technological component.

Unlike the cognitive and normative elements of the institutional environment, regulatory distance between home and MNE host country is *asymmetric* and the *direction matters* (Zaheer et al., 2012). Thus, in contrast to cognitive-normative distance, for regulatory differences I can assess both how different the two partners are, and which one is better. Albeit globalization and increased economic integration have contributed to the convergence of regulations worldwide, countries still exhibit significant heterogeneity in terms of IPR (Park, 2008; Peng, Ahlstrom, Carraher & Shi, 2017). Some of these differences involve important IPR aspects such as legal protection, actual enforcement, and coverage of these laws. By considering both the magnitude and the direction of this relationship between countries, I emphasize both *how*, and *how much* they differ in terms of IPR regulations. In turn, the magnitude and direction of these IPR differences may favor or hinder alliance activities across borders. Hence, upon considering a set of potential alliance partners, the

MNE can assess each of them as either having *stronger* (i.e. positive distance) or *weaker* (i.e. negative distance) regulatory institutions vis-à-vis its home-country environment.

One Edge of the Sword: Institutional Distance as a Hindrance for Exploitation

There are several reasons for which MNEs would prefer partners from closer cultural and managerial backgrounds for exploitative technological alliances. First, managers face significant *coordination concerns* upon establishing new alliances. These concerns stem from increased interdependence between partners and the logistics of alliance activities (Gulati & Singh, 1998); they include communication and decision costs that are contingent upon the cognitive-normative mismatch of partners (Delerue & Simon, 2009). Second, cultural and managerial proximity is commonly associated with intrinsic *attractiveness* and *trust*, which facilitate the transfer of technology between partners (Michailova & Hutchings, 2006). Technical knowledge has a major tacit component and is often embedded in people and organizations (Volkof, Strong & Elmes, 2007), thus trustful and attractive potential partners stand a better chance of being selected as technological allies. Finally, successful assimilation of technology demands certain *absorptive capabilities* (e.g., trained employees, knowledgeable managers, efficient routines, etc.) from potential collaborators (Mowery et al., 2002). Firms from closer normative-cognitive backgrounds have similar cognitive schemas and managerial dispositions regarding the use and share of technical knowledge, which will be easier to understand and adopt by the MNE (Xu et al., 2004) facilitating also the absorption of technology by partnering firms (Pisano, 1990). Therefore, they will be more appealing as partners for exploitation alliances (Grant & Baden-Fuller, 2004).

In contrast, more distant firms in terms of managerial and cultural background, will be less attractive as alliance partners, given that the MNE will need to devote additional resources to understand and deal effectively with these cognitive-normative differences (Chan & Makino,

2007). When dealing with such distant partners, the MNE needs to commit additional resources to tailor their alliance capabilities (Kale & Sigh, 2002) and bridge these differences (e.g., via new routines, work ethics, management training programs, upgrades of technological skills, etc.) for the alliance to succeed. As a result, *coordination costs* rise and impose greater uncertainty on both partners, which ex-ante make distant exploitative alliances seem riskier and costlier for the MNE (Gulati & Singh, 1998). Furthermore, cultural and managerial distance leads to *less cooperation* and *knowledge stickiness* (Szulanski, 1996) impeding the proper flow of technical knowledge between partners. Familiarity with local norms and behaviors is tacit and requires additional efforts from the MNE to secure full cooperation from its partners and fluidize the flows of knowledge in the alliance via common organizational routines (Kostova, 1999). Finally, cognitive-normative differences reduce the *absorptive capability* of partners to transfer and implement successfully technology from the MNE, given their different ways (e.g., cognitive schemas and managerial dispositions) of sharing and using technical knowledge. Such normative-cognitive differences can impose significant constraints on firms' other activities and are a leading cause of alliance failures (Park & Ungson, 1997; Mohr & Spekman, 1994). Therefore, when engaging a distant cognitive (cultural) and normative (managerial) partner for exploitation, the MNE will face higher adjustment costs and greater uncertainty regarding the alliance. Thus:

H1: All else equal, when forming a technological alliance for exploitation, the MNE will prefer partners from closer normative and cognitive environments.

Furthermore, there are several rationales for which a MNE seeking international partners for an exploitative technological alliance will prefer firms from countries with similar or stronger regulatory environments (i.e., IPR). First, similar or stronger IPR regulations reduce MNE's *appropriation concerns*, thereby improving its ability to capture greater rents from the alliance

(Gulati & Singh, 1998) and benefit more from co-specialization of partners (Gimeno, 2004). Second, IPR facilitates the *transfer of technology* between partners by providing a global institutional framework for specialized markets for technologies, where firms can exploit their knowledge-intensive assets via licensing and other commercial tools (Arora et al., 2001). Finally, countries with similar or superior IPR regimes than that of the MNE will facilitate an efficient transfer of technology given their compatible *IPR standards* (Gans, Hsu & Stern, 2008) and similar *innovation capabilities* (Krammer, 2009). In turn, these will increase MNE's opportunities for exploitation via technological alliances (Lavie & Rosenkopf, 2006; Yamakawa et al., 2011; Peng et al., 2017).

In contrast, the MNE will be more wary of having partners from countries with weaker (i.e., less stringent) IPR regulations when forming an exploitation alliance, given the high appropriation concerns (Gulati & Singh, 1998), reduced benefits from co-specialization (Gimeno, 2004), and difficulties in the transfer and commercialization of technologies (Branstetter et al., 2006; Krammer, 2009). Within an alliance, the scope of technical knowledge transferred to partnering firms is difficult to limit and monitor by the MNE, requiring costly *alliance functions* (Kale & Singh, 2002) and raising concerns about *free riders* and *technology leakages* (Pisano, 1990; Krammer, 2016). These concerns are further inflated by weaker IPR regulations that facilitate technology leakages to domestic firms (Teece, 1986) and lower MNE *ability to capture rents* from exploitation of its current technological assets (Khoury & Peng, 2011)¹. Furthermore, worse IPR regulations than the home-country ones will interfere with MNE's ability to transfer technology to its partners. In such cases, lower IPR standards increase will MNE's perceived costs of sharing

¹ For example, in 2009 the US International Trade Commission has estimated that American firms in China lost around \$48.2 billion because of such IPR violations.

technology by raising *incompatibility issues* in terms of dealing with intellectual property (Gans et al., 2008), and exposing them to threats of *imitation* or expropriation (Martinez-Noya & Garcia-Canal, 2011). As a result, firms from countries with worse regulatory environments compared to the MNE's home institutions will be less attractive as partners for a technological alliance (Contractor & Ra, 2002). In sum, MNEs will seek to partner up in exploitation alliances with firms that are better or, at least, close in terms of regulatory provisions to their home environments. Based on all these arguments, I hypothesize that:

H2: All else equal, when forming a technological alliance for exploitation, the MNE will prefer partners from similar or stronger regulatory environments.

The Other Edge of the Sword: Institutional Distance as an Advantage for Exploration

I expect differences across institutional background to also affect partner selection for explorative alliances, though in different ways, and possibly at varying magnitudes. When searching for new knowledge through exploratory alliances, the MNE is implicitly committing itself to enter new domains and tap uncharted territories (Grant & Baden-Fuller, 2004). While exploration is by definition a risky endeavor, pursuing partnerships in distant cognitive and normative backgrounds, it provides both the MNE with the potential to learn new routines and unique solutions which are often rooted in local and national contexts (Morosini, Shane, & Singh, 1998). This diversity often stimulates managers to be more creative in terms of identifying and dealing with problems, thereby improving the efficiency and coherence of their decisions (Gomez-Mejia & Palich, 1997). Moreover, cognitive and normative heterogeneity is often associated with greater creativity and innovation (Cox and Blake, 1991), allowing firms to break certain organizational rigidities and develop new sources of knowledge (Barkema & Vermeulen 1998; Stahl et al., 2010). Thus, diversity in terms of cultural backgrounds and managerial practices

facilitates successful exploration endeavors, both in terms of innovative and international activities (Nathan & Lee, 2013).

Furthermore, cognitive and normative differences will be positively related to partner selection for exploration simply because they are desirable when a firm is looking to import a different knowledge set. The specialized roles and routines of well-established MNEs tend to reduce the exploration opportunities of individuals in these firms (Sorensen, 2007), resulting in reliance on exploitative rather than explorative avenues to sustain performance (FosstenlØkken, LØwendahl, & Revang, 2003). Given that both cognitive and normative differences are tacit, symmetric and dyadic (Zaheer, Schomaker & Nachum, 2012), they meet well the challenges involved in absorbing a new, uncodified knowledge base. Technical knowledge, when exploratory, has a strong tacit component (Volkof, Strong & Elmes, 2007), and therefore the more cognitively and normatively different partners will be, the more opportunities for exploration will exist within the alliance.

Finally, cognitive and normative distance between partners provides access to more heterogeneous resources that increase the overall absorptive capacity of the alliance. The successful assimilation of knowledge requires potential collaborators to possess good absorptive capabilities, e.g., R&D activities, trained employees, knowledgeable managers, and efficient routines (Mowery et al., 2002). While people that have been raised in different environments tend to understand and evaluate differently operational problems, this distance is particularly useful in the case of exploration alliances (Noteboom et al., 2007), where learning and cross feeding are critical for overcoming the limitations of contextually localized searches (Rosenkopf & Almeida, 2003). Thus, a cognitive-normative distant partner who brings into the alliance people who are differentially socialized, may be deemed especially useful in the context of an exploratory alliance. Subsequently, I posit that:

H3: All else equal, when forming a technological alliance for exploration, the MNE will prefer partners from distant normative and cognitive environments.

The effects of regulatory distance on the selection of partners for exploration alliances can arguably be both positive and negative. On one hand, despite embracing ex-ante the uncertainty and risks associated with exploration, MNEs may still seek partners that are similar or better ranked in terms of IPR protection (Gulati, 1998). Thus, despite dealing with nascent technologies or fundamental knowledge that is of mostly tacit nature, the risks of *leakage* and *loss of potential rents* may still drive MNEs towards partners that are perceived to be closer in terms of regulatory prescriptions to minimize their appropriation concerns (Yang, Zheng, & Zhao, 2014). Second, similar or stronger IPR standards adopted by prospective partners will reduce *communication and development costs* (Gans et al., 2008) typically associated with exploratory endeavors (e.g., a joint R&D alliance). Having such IPR standards will allow specialists in the alliance to convert sophisticated specialized knowledge into directives, rules, and operating procedures that can be easily transferred between partners, and later on integrated into innovative products and services (Grant & Baden-Fuller, 2004). Finally, having partners from closer regulatory environments will reduce the costs associated with the exploration portfolio of the MNE. As alliances become a primary vehicle for seeking new knowledge and technologies, many MNEs have developed large portfolios of partners that involve significant management costs and resources (Kale, Dyer, & Singh, 2002). While firms with such dedicated “*alliance functions*” achieve better financial results and higher success rate for their alliances, the costs required to maintain these functions increases with heterogeneity of partners in a firm’s portfolio. Hence, distant regulatory partners contribute directly to these costs, making them less attractive for exploration. Therefore:

H4a: All else equal, when forming a technological alliance for exploration, the MNE will prefer partners from similar regulatory environments.

Alternatively, there are several grounds as for why regulatory differences may be helpful for MNEs seeking exploratory alliances. First, regulatory IPR differences may enable companies to leverage rules and regulations that are conducive to the development of new knowledge to the MNE, e.g., more liberal clinical trials for a pharmaceutical company in a country with more liberal/unregulated markets (Ghauri & Rao, 2009). In this way, the opportunities for *institutional arbitrage* are greater (Gaur et al., 2007), and will benefit directly the search for knowledge by allowing the MNE more leeway in its exploration endeavors. Second, with respect to appropriation concerns, IPR gaps are less threatening to a firm in exploratory alliances because appropriability is less of a risk due to *tacitness and fluidity of technological knowledge* (Martinez-Noya & Garcia-Canal, 2011). Thus, distant partners in IPR do not translate automatically in lower ability of MNEs to capture rents from the potential technological gains of an exploratory alliance (Gimeno, 2004). Finally, given the nature of the sought benefits (e.g., tap into new sources of technologies, cross-feed across very different technological assets or portfolios) the knowledge transfer between partners will rely less on codified information (which falls directly under the regulations of IPR) in favor of *tacit* one, embedded in people and organizations (Volkof et al., 2007). As a result, greater IPR distance, regardless of its direction (i.e., positive or negative) can improve the attractiveness of a firm as an alliance partner for exploration. I therefore propose that:

H4b: All else equal, when forming a technological alliance for exploration, the MNE will prefer partners from more distant regulatory environments.

METHOD

Setting, sample and data

To test these hypotheses, I use data on firms from the global tire industry. I focus on this industry for a number of reasons. First, over time, tire producers have formed numerous horizontal strategic alliances, providing a rich environment for studying partner selection. Second, this is a truly global industry, with firms in more than eighty countries, capturing greater institutional heterogeneity than the "usual suspects" in the alliance literature (i.e., high-tech sectors, confined to few developed nations). Finally, technology has always played an important role in this industry, especially at the top where significant R&D efforts take place (see Table 1). An in-depth analysis of patenting activities by leading tire manufacturers supports this conjecture and suggests that these industry leaders maintain a broad spectrum of capabilities which helps them to integrate various streams of knowledge and technologies (Acha & Brusoni, 2005). Moreover, technological capabilities have always played a critical role in the tire industry, shaping its historical evolution (Klepper & Simons, 2000) and triggering new managerial responses (Sull, 2001) and international dynamics (Ito & Rose, 2002).

[Table 1 about here]

The dataset employed in this study is comprised of data on all tire producers worldwide, manually collected from various issues of the *European Rubber Journal* (ERJ)². Since partnering in a technological alliance is the dependent variable, I limit the sample to the years for which this information is available from these journals, namely 1985 to 2003³. To estimate partnering choices,

² These agreements have been cross-checked with alliance and joint-venture data from Thomson's *SDC Platinum*, however the ERJ data is much richer in documenting all technological interactions.

³ After 2003 ERJ has stopped providing information on technological alliances.

I construct a dataset of all possible dyads between firms in the industry over this period⁴. I then add to this data other firm characteristics (e.g., size, age and ownership) for both members of the dyad, also from ERJ.

In addition, I have manually collected data on tire-related patents assigned to these firms from Derwent Innovation Index (ISI Thomson), which has wide international coverage from multiple national patent offices. To assemble the patent data, I identify all patents assigned to tire producers and their affiliates that refer to tire products or processes. Using this information, I compute firm knowledge stocks in the “tires” domain, assuming an annual depreciation rate of 15 percent to discount their commercial and scientific relevance over time (Griliches, 1990). For firms that do not hold patents, I assume a null stock of technological knowledge. Analyzing the announcement of firms’ alliances activities (ERJ), I identify whether an MNE (i.e., the focal firm) selects a partner in a dyad to form either an exploitative or an explorative technological alliance (coded as 1, and 0 otherwise). Following the text of these announcements, I identify the *focal firm* in a dyad to be the one that provides technology to its partner for exploitation, and respectively the firm taking the lead role in exploration alliances. For dyads with firms that do not form a technological alliance (i.e., no alliance announcement available), I consider the focal firm to be the one with the larger knowledge stock (i.e., granted patents) of the two. In case both firms have the same number of patents, the first firm listed in the dyad is arbitrarily considered the focal one. Lastly, I match the firm-level data with country characteristics such as gross domestic product

⁴ This excludes data from the first three years available (1986-1988), which are used to compute the “previous alliance experience” of partners variable (described in the subsection “Controls”). Thus, there are on average about 220 active firms in the tire industry each year, yielding around 385,000 potential undirected dyadic observations (220 times 219, divided by 2 then multiplied by 16 years), before discarding missing observations.

(GDP), GDP growth, geographic distance, institutional distances, colonial ties, and economic ties. Firms from countries where these data were not available have been dropped from the sample.

Dependent variable. Data on technological alliances between tire producers worldwide come from various issues of the Global Tire Report published in the *European Rubber Journal* (ERJ). Following prior work on technological alliances, I focus on the horizontal dimension of these agreements (Mowery et al., 2002; Lavie & Rosenkopf, 2006; Hoang & Rothaermel, 2010). This is consistent with theoretical arguments for clarity (Phelps, 2010) that favor horizontal alliances as a venue for technological exploitation and exploration, the unavailability of complete data on the population of firms in other industries (i.e., for vertical alliances), and the massive concentration of tire technologies within the industry with few outside players involved (Acha & Brusoni, 2005). Hence, I examine the horizontal selection of international partners for technological alliances, either exploitative or explorative, as described in the original ERJ text.

Following the literature (Lavie & Rosenkopf, 2006; Yamakawa et al., 2011), I capture both *exploitative* alliances, which involve "the use and development of things [i.e., technologies] already known" (March, 1991) and *explorative* alliances, which aim to create new-to-the-firm resources and competences in a desire to seize new strategic opportunities (Koza & Lewin, 1998). I consider several types of exploitative alliances (i.e., long-term agreements involving joint marketing, service, OEM, licensing, supply and joint-production deals) in which the focal firm (i.e., the MNE) provides existing technologies to its partners in exchange for certain benefits (e.g., access to production facilities, services, etc.) and explorative alliances (i.e., R&D alliances, R&D joint-ventures, and long-term cross-licensing deals), which are commonly forged for explorative purposes such as development of technology standards, solving of technical issues or technological

collaboration⁵. Thus, my dependent variable (*Partner selection*) is a binary dependent variable that equals 1 if the two firms in a dyad form a cross-border technological alliance in a year for exploitation (*Exploit*) and respectively, exploration (*Explore*) purposes, and zero otherwise. Multi-partner alliances are treated as separate dyads for consistency. However, such agreements are extremely rare in the tire industry and tend to be exclusively geared towards exploration between top firms working on new technologies or seeking to promote new industry standards. The number of active alliances in the industry has steadily increased from 75 alliances in 1985 to 113 in 2003, with 81% forged for exploitative reasons. In terms of geographic distribution, I can see a concentration of technologies in the Triad countries (i.e., EU, Japan and the USA), which dictates pretty much the distribution of partners for exploration alliances (with the exception of several alliances with South Korean firms). In turn, the exploitative alliances are much more heterogeneous with partners, especially at the receiving end of these technologies, covering emerging markets from Asia, Africa and also Eastern Europe. Therefore, this heterogeneity justifies adopting a continuous measure of distance, as opposed to looking at average distance between blocks of countries (Beugelsdijk & Mudambi, 2013). Finally, given that I consider all possible dyads between all firms in the industry, the number of instances in which the DVs take the value of 1 is extremely small (0.18% for exploitation and 0.02% for exploration) mandating corrections for rare-events, as described in the next section.

Independent variables. Following previous studies (Gaur et al., 2007; Estrin et al., 2009; He et al., 2013), my measure of the *cognitive* environment focuses on national culture differences as a determinant of alliance decisions (Steensma et al., 2000, Delerue & Simon, 2009). I compute

⁵ Concerning location of alliances, this is not an issue for all contractual agreements, distance being computed between the home countries of the two partners. However, in the case of JVs I do take into account specifically the location of the new entity based on the information provided by ERJ and use it for computing respective distances.

a cultural distance index using Hofstede's five dimensions of culture (Hofstede et al., 2010) extracted from the website: <http://www.geert-hofstede.nl>. Together, these dimensions capture potential cognitive conflicts between alliance partners that stem from national differences in respect for authority [power distance], trust and job security [uncertainty avoidance], independence and the role of government [individualism], importance of family and work [masculinity], and future expectations [long-term orientation] (Shenkar, 2001).

My measure for the *normative* environment focuses on international management practices and reflects how inter-firm transactions are conducted across countries. Similar measures employing managerial attitudes and norms were used by other studies examining ownership (Xu et al., 2004) and MNE export strategies (He et al., 2013). Following them, I consider nine managerial norms (Cronbach's alpha = 0.91) retrieved from IMD's World Competitiveness Yearbook, which are relevant for partnering decisions in an international context: competence, credibility, efficiency of corporate boards, employee training, flexibility and adaptability, international experience, social responsibility and worker motivation⁶. Given the potential overlap between these variables, I perform exploratory factor analysis to determine the normative dimension (Table 2). Subsequently, variables with uniqueness above 0.6 are removed, and from the remaining seven items (alpha = 0.93) I derive a principal component (Eigenvalue = 4.53) for the latent variable that captures average managerial norms in a country⁷.

[Table 2 about here]

⁶ For example, in terms of managerial competence, Israel, USA and Switzerland score the highest, while Croatia, Bulgaria and Peru are the lowest.

⁷ Using command *factortest* in Stata I perform additional tests (Bartlett's sphericity, Kaiser-Meyer-Olkin sample adequacy) to assess the appropriateness of factor analysis, all with satisfactory results.

Mirroring prior studies (e.g., Krammer, 2009; Cockburn et al., 2016) the technology-specific *regulatory* elements are measured using global data on intellectual property rights (IPR). IPR data comes from Park's (2008) and covers five crucial aspects of IP: extent of coverage (patentability of different products), membership in international agreements (e.g., TRIPS, international patent conventions), enforcement options (e.g., injunctions, infringements), restrictions on patent rights, and duration of protection. This index is computed as a weighted average of these five dimensions and covers 122 countries over the period 1960-2005⁸. The frequency of observations is every five years, and values have been linearly interpolated under the assumption that these laws do not vary significantly within this interval.

Data on cognitive and normative institutions are used to compute dyadic (symmetric) distances between two countries using the Mahalanobis formula (Berry et al., 2010)⁹. Regulatory distance between countries is computed as a simple difference between the IPR score of the focal firm (i.e., the MNE) and its prospective partner in a dyad. This distance is asymmetric and in this case direction counts, hence, the partner can be “stronger” (positive value) or “weaker” (negative value) vis-à-vis the MNE (Zaheer et al., 2012). Both regulatory and normative distances vary over time to accommodate potential institutional dynamics (Frantianni & Oh, 2009). Given that I have multiple reference countries when computing these distance measures within a dyad, I do not include level effects (Beugelsdijk, Kostova, & Roth, 2017).

Controls. I include several other variables that are closely related to alliance partner selection. Firm size and age (experience) are two important determinants of its strategy (Kale & Singh, 2009). *Firm size differential* is computed using the production capacity of firms within a

⁸ USA, Netherlands and Japan have the strongest IPR provisions, while Burma, Angola and Guyana have the weakest.

⁹ The correlation between the Euclidian distance and the Mahalanobis one is fairly high (0.69 for cognitive and 0.70 for normative) and statistically significant at 1%, suggesting that either one can be successfully employed in this case.

dyad, while *firms' age differential* is determined using the opening year of their first plants. To capture the strategic interdependence between firms (Gulati, 1995b) in terms of technologies, I calculate the *firm knowledge differential* using firms' annual patent stocks computed from Derwent Innovation Index with a 15% annual depreciation rate (Griliches, 1990). To control for benefits from prior or current equity links between firms in a dyad, several dummies are included for cases in which partners are *majority*, *minority* ownerships or *joint-venture* projects. Another important motivation for international exploitative alliances is to access new, dynamic markets (Glaister, 1996). At the country level, *market size differential* and *market growth differential* are computed using GDP figures for both countries involved, extracted from the World Penn Tables 7.1. Furthermore, a common proxy for external uncertainty in international business is geographic distance (Berry et al., 2010). To account for this, I use a more refined measure of *geographic distance* (weighted by population) between countries obtained from the CEPII database. This distance corrects for agglomeration effects (e.g., economic and population terms) within countries that might bias upwards the coefficient of a simple geodesic distance. To control for "border effects" known to impact economic exchanges between countries (Schulze & Wolf, 2009), I employ a dummy for *geographic contiguity* (CEPII). Finally, a critical ingredient for alliances is the existence of dedicated capabilities (Kale & Singh, 2002). I proxy these capabilities using *previous alliance experience* (calculated as the cumulative number of alliances for both firms in a dyad in the 3 previous years) and a partner-specific experience dummy (*prior interactions*), which captures whether the two firms in a dyad have previously engaged in other alliances.

[Table 3 about here]

Estimation technique

The unit of analysis is the dyad, and I consider all undirected pairs of firms in the tire industry for which data on all explanatory and control variables is available. For consistency, I use the listwise deletion method to deal with missing observations and preserve the same sample across different empirical specifications. After eliminating all missing observations for these variables, we are left with a sample of 204,366 dyadic observations. Table 3 presents descriptive statistics for all variables. Analyzing firm dyads increases significantly the dimension of the dataset, but also introduces an additional problem: given the very low (only 0.18 percent for exploitation and 0.02 for exploration) number of *1*s in the data, running a regular probit or logit estimation will underestimate the probability of selecting a partner for both types of technological alliances. Thus, I employ a rare-event logit model that relies on maximum likelihood estimation and generates coefficients with lower mean square errors than the standard model by correcting for rare-events (King & Zeng, 2001). Moreover, since the data contain all possible dyads among these firms across time, it faces potential problems of unobserved heterogeneity and autocorrelation. To deal with this, I follow Wang & Zajac (2007) and use robust standard errors clustered on each dyad in all estimations. Time dummies are added to all estimations.

A second major concern regarding the partner selection process in alliances refers to endogeneity. Many studies have investigated partner selection by estimating regressions using a sample of observed alliances, under the assumption that the selection process is independent of the firm characteristics. However, it is likely that these characteristics affect both the decision to engage in a technological alliance and that of whom to partner with. Thus, the former is a result of a firm's own characteristics (e.g., range of available technologies, market potential, experience etc.), while the latter depends on the characteristics of both prospective partners. To deal with these endogeneity concerns I use a two-stage correction procedure (Heckman, 1979). Using probit

analysis, the first stage estimates the probability of a firm to engage in technological alliance as a function of its size, age, patent stocks, home market size and dynamics. In this first stage the unit of analysis is the firm. In the second stage, using a rare-event logit estimator, I analyze whether firms choose partners systematically based on different firm and country specifics. To correct for the self-selection issue, I include an Inverse Mills Ratio derived from the probit regression of the first stage. In the second stage the unit of analysis is the dyad. Since I use a two-stage selection model, the first-stage variables (instruments), which are firm-specific, do not appear in the second stage regressions.

[Table 4 about here]

Table 4 presents the pairwise correlation matrix. Most correlations are within acceptable limits, indicating that there are no severe collinearity issues to affect these estimations.

RESULTS

Table 5 reports the effects of institutional distance on selection of international partners for exploitation and exploration. In terms of significant effects of control variables, with respect to exploitation, most of these effects pertain to ownership strategies (with majority and minority holdings trumping the effect of JVs), differentials in terms of market growth potential, and alliance-specific factors such as previous experience or interactions between two partners, in addition to the correction factor for self-selection (i.e., the Inverse Mills ratio). For exploration alliances, in addition to these factors, firm knowledge, age and size differentials are also detrimental as well as differences in terms of market size. Interestingly, and as expected from a diversity perspective, geographical distance has a positive effect on partner selection.

[Table 5 about here]

Going to the hypotheses now, the results support H1 and H2, namely that, *ceteris paribus*, institutional distance reduces a partner's appeal for exploitation alliances. Thus, cognitive, normative and regulatory distance have all negative and highly significant coefficients suggesting that MNEs prefer partners from similar institutional environments for exploitation. In turn, institutional distance appears to be conducive of partnering for exploration, thus supporting H3 and H4b. Both cognitive and regulatory distance exhibit positive and highly significant coefficients in these regressions¹⁰. The exception is normative (managerial) distance, which is negatively associated with partner selection for exploration alliances. Lastly, it is worthwhile mentioning that the effects of all three institutional distances are additive and robust, at least for exploitation (Model 5), as postulated by the theory (Kostova, 1999).

Considering the nonlinear nature of the chosen estimator, the above coefficients provide limited information above the economic magnitude of these effects. Subsequent analyses carried out have explored this issue in more depth by examining the marginal effects for my main variables of interest and contrasting them with those of main controls. The full batch of these results is available upon request. For this exercise I have used the final results for exploitation and exploration alliances reported in Models 5 and respectively 10. Overall, these results are in line with my main findings and in terms of magnitudes comparable with other studies that have used large dyadic settings (Vasudeva, Spencer, & Teegen, 2013). Thus, all else equal, for an average firm when considering prospective partners for exploitation, moving from lower cognitive distance (e.g., USA-Guatemala), to a medium one (e.g., USA-South Africa) or a larger one (e.g., USA-China) can reduce the probability of selection by up to 2.88 percent. Similarly, the propensity to select distant

¹⁰ To test H4b in Model 9 I use an absolute value of IPR distance as opposed to a simple difference. In this way, a positive coefficient would support H4b, while a negative one would support H4a.

partners in terms of normative and regulatory institutional backgrounds decreases with distance by up to 0.38 percent in the case of very distant regulatory backgrounds (e.g., USA-Angola) and 0.18 percent for very distant normative ones (e.g., Malaysia-Russia), all else equal. By contrast, for selection for exploration alliances, more distant cognitive partners (e.g., USA-Japan) and less distant normative ones (e.g., France-Germany) will be more attractive for selection, but the magnitude of these effects on selection is slightly smaller (reaching up to 2.16 percent for cognitive and 0.07 percent for normative in the case of very distant partners). Overall, these effects provide a more intuitive picture regarding the relevance of institutional distance for selection of partners in both exploration and exploitation alliances, suggesting that while institutional differences are important and on-par with other firm-specific explanations, other factors (such as previous links between firms or equity links between prospective partners) tend to prevail in terms of magnitudes.

Robustness checks

I test the robustness of these results by performing several other analyses. First, I include several other cross-country distances (i.e., connectedness, knowledge, economic, and political) proposed by Berry et al. (2010). Despite a significant sample size reduction, the coefficients of the institutional distances considered remain negative and highly statistically significant, except for normative distance, re-enforcing my prior conclusions. Of all these additional distance measures considered, only economic distance is statistically significant, implying that partner selection is generally negatively affected by differences in the macroeconomic conditions surrounding prospective partners.

Second, alliance experience is commonly computed in the literature using the number of alliances a firm forms in the past 5 or 10 years. Given the time coverage of this dataset (19 years) and the strong correlation across time between the number of alliances firms form in a year, I have

opted for a shorter time window of three years. However, as a robustness check I have re-run all regressions using more restrictive windows of 5 and 10 years, respectively, for computing the alliance experience variable. As expected, the magnitude of these coefficients is smaller (e.g., on average, 0.44 for 5-year and 0.34 for 10-year window), but the main results hold despite the severe reductions in sample size (counting around 115,000 and respectively 64,000 observations for the 5- and 10-year window). Results of these robustness checks are not reported here due to space constraints but are available upon request.

Finally, an alternative explanation for the impact of institutional differences on partner selection is that these differences could have a discrete rather than a continuous effect. To test this possibility, I have used the cultural clusters developed by Ronen & Shenkar (2013) to compute an additional control variable (*samecultcluster*) which is a dummy that equals 1 when the two countries in a dyad belong to the same cultural cluster, and 0 otherwise. The results of this analysis suggest that sharing the same cultural cluster does not make a difference when it comes to neither exploitation or exploration alliances. The sign of *samecultcluster* remains negative and not statistically significant while the main explanatory variables retain similar, signs, magnitudes and statistical significance.

DISCUSSION AND CONCLUSIONS

Although technological alliances have become a popular tool for securing competitive advantage (Anand & Khanna, 2000), their success hinges heavily on the selection process (Shah & Swaminathan, 2008). In an international context, this process involves vetting of potential partners for institutionally-related differences that may affect the performance of the alliance (Hitt et al., 2004; Sarala et al., 2014). This study sheds light on the role played by institutional differences in the partner selection process by employing a set of theoretical lenses to disentangle these complex

effects. The first such lens, which seeks to infuse strategic objectives into the partner selection process, derives from the nature of objective/s of the alliance regarding knowledge seeking and learning, and is reflected by the exploration and exploitation tension (Koza & Levin, 1998; Lavie & Rosenkopf, 2006). The second lens, which aims to capture the complexity of the international environment, is Scott's (1995) distinction among normative, cognitive, and regulative pillars of institutions (Xu & Shenkar, 2002; Eden & Miller, 2004) and the distance between countries across these institutional dimensions (Kostova, 1999) as a criterion for partner selection.

Although generated by disparate theoretical currents, these lenses are of complementary nature, forming a comprehensive ensemble with which to understand cross-border alliances, and in this case, the selection of new partners. One combination of the above lenses, which I explore in this paper, is between specific institutional pillars and the strategic logic of exploration versus exploitation. The results confirm the core theoretical conjectures of the paper, namely that MNEs seek partners from closer institutional backgrounds for exploitative endeavors, driven by efficiency and appropriability concerns for their technological assets. In turn, the selection of alliance partners for exploration is positively related to institutional distance across cognitive and regulatory elements, as the opportunities for technological learning (Teece, 1986) and institutional arbitrage (Gaur et al., 2007) are greater. Overall, these contrasting forces provide a balanced and realistic view of the institutional gaps between alliance partners, confirming their complex role in the selection process.

Another insight from this work is that the effects of institutions on firm strategies varies across different types of institutions considered. I find that distant cognitive and regulatory partners are more appealing for exploration alliances given the need to diversify and complement each other's knowledge (Schildt et al., 2005). Nevertheless, differences in terms of normative (managerial) values act as a barrier even for exploration alliances, suggesting that the greater transactions costs and uncertainty associated with these differences deter firms from pursuing such

partnerships (Olie, 1994; Zhao, 2006). Together, these findings provide a more fine-grained view of the effects of institutional distance, and signal the importance of distinguishing between different institutional pillars, as their effects might not be uniform in relation to a given firm strategy (Yamakawa et al., 2011).

Last but not least, my results support the idea to view institutional differences as enacted by the underlying strategic logic of an alliance, which in this paper is the nature of the knowledge search, drawing a clear distinction between exploration and exploitation objectives (March, 1991). My theoretical arguments support the antipodal institutional effects in relation to knowledge seeking, providing an explanation as to why certain national differences may appear to be conducive to certain alliance activities, while inhibiting others (Parkhe, 1991). This finding is at odds with the dual strategic role of alliances in accessing and acquiring external knowledge, and its subsequent effect on improving its integration and utilization in the production process (Grant & Baden-Fuller, 2004).

On a theoretical level, this study advocates a convergence between TCE arguments, which emphasize complementarity and interdependence as prime rationales for partner selection (Williamson, 1975; Hennart, 1988), and institutional theory, which views institutions as motivating and shaping firm behavior (Di Maggio & Powell, 1983; Scott, 2001). A core contribution lies in theorizing how different institutional pillars affect partner selection for alliances, thus complementing prior findings on the role that firm-specifics (Annand & Khanna, 2000; Rothaermel & Boeker, 2008) and national idiosyncracies (Hitt et al., 2000; Hitt et al., 2004) play in this selection process. Moreover, the mechanisms through which different institutions affect the selection process appear antipodal, contingent on the learning objective –exploration or exploitation- of the alliance (March, 1991), resulting in a “double-edged sword” effect of institutions on firm strategies. Finally, my findings suggest that cognitive and normative differences tend to trump in magnitude the effect of regulatory gaps between prospective partners,

consistent with prior, albeit qualitative evidence (Olie, 1994). Thus, regulatory regimes that have a key position in the transaction costs argument and are a vital component in the broader economic view of “formal institutions” need to be supplemented by informal institutions, with each fulfilling a different role (North 1990; Vasudeva et al., 2013; Krammer, 2017). This resonates also with the idea of MNEs internalizing regulatory deficiencies abroad via dedicated internal mechanisms designed to reduce appropriation concerns and other negative externalities (Zhao, 2006).

Policy and Managerial Relevance

These findings draw the attention of policy makers and managers to the importance of cognitive (cultural) and normative (managerial) differences that lead to divergent behaviors (Kelly et al., 2000) that may affect the success of an alliance (Delerue & Simon, 2009). In particular, large cognitive and normative differences are notoriously difficult to overcome due to their tacit nature and centennial inertia (Hofstede et al., 2010), and this burden will largely fall on management in charge of these inter-firm relationships. Consequently, distant normative and cognitive partners deserve more consideration from managers when considering an alliance. At the same time, weaker regulatory (i.e., IPR) environments of a prospective partner vis-a-vis the home country of the MNE will reduce its appeal as an alliance partner, prompting the significant role policy makers can play in facilitating these technological transfers across borders via alliances by improving IPR standards and their enforcement (Khoury & Peng, 2011). As a result, host-country managers should lobby policy makers for reforms or develop alternative safeguarding mechanisms to attract MNEs as technological partners. In exploration alliances, greater institutional distance across cognitive and regulatory elements is associated with more appeal for exploration alliances, where firms seek to complement each other in terms of knowledge and technologies (Koza & Levin, 1998); however, this does not negate the value of a developing a sharing platform to enable effective cooperation and knowledge dissemination. Thus, firms must develop and preserve a certain degree of strategic

agility when seeking exploration via technological alliances (Weber & Tarba, 2014). Complementarily, the development of managerial skills and adherence to international standards can help in that, and should become a priority at the level of both nations (i.e., via educational curricula) and firms (i.e., via in-house training).

Limitations and Suggestions for Future Research

This study has several limitations that could serve as starting points for future research. First, whereas my theoretical predictions do not rely on any idiosyncratic features of the industry, and therefore are generalizable to other empirical settings, the empirical testing relies on one industry. Thus, future studies in this area may want to test whether these antipodal effects of distance hold across different industrial contexts with significant international coverage to ensure sufficient institutional heterogeneity. While these effects could be valid across different industries, other idiosyncratic characteristics may result in different magnitudes and rankings for the MNEs in terms of priorities and institutional barriers, as suggested by scant work in this area (Olie, 1994).

Second, I have focused exclusively on the technological and horizontal (i.e., within-industry) dimensions of alliances, given the concentration of technology production and assets (i.e., patents) among top tire producers (Acha & Brusoni, 2005) and the special feature of the tire industry, which has been historically dominated by horizontal rather than vertical technological exchanges (ERJ, various issues). However, firms in other contexts (e.g., high-tech industries such as pharmaceuticals or biotechnology), characterized by complex and dynamic technological environments, often adopt a more mixed partnering strategy, which includes both horizontal and vertical alliances for exploration and exploitation (Rothaermel & Boeker, 2008). As such, an interesting extension of this work would be to incorporate, particularly in other industry-settings that fit better this description, the non-technological and vertical types of alliances formed by focal

firms of the industry. This would allow for richer theorizing of institutional and learning rationales across a wider array of alliances.

Third, the nature of the data (i.e., secondary) and empirical setting (i.e., mature, low-tech, concentrated industry) limits our ability to control for compatibility, commitment, and complementarity of partners to differences in terms of age, size, and knowledge stocks. Ideally, a combination of primary and secondary data could further refine our understanding of how and when firm specifics trump institutional contingencies for selection of partners. Similarly, future studies may test specifically the effects of international experience at the level of the firm (e.g., prior presence, or international sales in these markets) or even deeper levels of analysis (e.g., executive international experience, cultural breadth of the board etc.) which are not available for many firms in this industry, in particular those from emerging markets. Such research will extend the ramifications of the present study by reaching into other key domains of alliance research.

Finally, despite its popularity in the international business community, inconsistent and often contradictory findings regarding the effect of distance on firm international activities have raised important operational and methodological challenges (Zaheer et al., 2012; Ambos & Håkanson, 2014). The focal objective of this study was to theoretically explain and test empirically the antipodal effects of institutional distance on selection of partners. To this end, I have employed different operationalization choices for the main independent variables, in line with previous studies (e.g., Gaur et al., 2007; He et al., 2013). Nevertheless, these choices rely on several critical assumptions that need further examination. For instance, while I specifically allow for asymmetric effects in the case of regulatory (IPR) distance, I have treated cognitive and normative differences as symmetric under the assumption that the magnitude (but not the direction) of these differences matters for the process of alliance partner selection. In turn, recent contributions in this area suggest that asymmetry could be important, particularly for certain firm strategies and cultural dimensions (Beugelsdijk et al., 2017; Huang, Zhu, & Brass, 2017) and for identifying causal mechanisms

behind these relationships (Håkanson et al., 2016). Although in the particular context of the tire industry, most exploitation alliances do not exhibit reversals within the dyad in terms of origin of focal firms, and exploration alliances work on the assumption that larger distance would be beneficial, the magnitude of effects for distances may differ once asymmetry is specifically captured. Hence future research may want to explore this issue through primary data collection of institutional differences across countries, as perceived by firm managers. These endeavors would allow us to closer examine whether such critical assumptions of distance metrics (e.g., symmetry) are met in the context of large samples and particular strategies (e.g., technology sharing via alliances; M&As; outsourcing; FDI, etc.).

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Rank	Company	Country	Average sales	Percent Tires	No. Plants	No. Countries	R&D spending	Employees	Investments
1	Michelin	France	10,892	93	56	14	735	128,165	1,290
2	Bridgestone	Japan	9,703	75	44	19	354	102,165	1,573
3	Goodyear	USA	9,616	86	45	22	449	106,724	805
4	Continental	Germany	3,762	43	21	12	401	63,832	619
5	Sumitomo	Japan	2,903	74	6	3	174	15,000	375
6	Pirelli	Italy	2,712	45	18	10	216	41,954	500
7	Yokohama	Japan	1,978	72	8	3	104	5,401	175
8	Toyo	Japan	1,140	64	5	3	74	5,848	97
9	Cooper	USA	1,138	53	5	2	40	21,185	150
10	Kumho	South Korea	914	100	4	2	42	5,510	154
11	Hankook	South Korea	826	95	4	2	51	4,152	128

Table 1: Top global tire producers

Notes: (1) Average sales and percent of sales from tires are computed between 1984-2003 in million US\$; R&D spending and investments (in million US\$), number of plants, number of countries in which these companies are present, and the number of employees, are all for 2003; (2) The top three tire producers worldwide account for almost half, while the top 11 producers account for about two thirds of the total R&D expenditures in the industry. Source: various issues of the European Rubber Journal.

Variable	Factor1 Managerial Values	Uniqueness
Competence of managers	0.69	0.52
Credibility of managers	0.89	0.20
Corporate boards effectiveness	0.81	0.35
Employee training	0.77	0.40
Flexibility and adaptability	0.48	0.77
International experience of management	0.72	0.49
Remuneration of management	0.20	0.96
Social responsibility	0.83	0.31
Worker's motivation	0.89	0.21
Eigenvalue		4.53
Alpha		0.93

Table 2: Factor loadings of managerial values items form IMD WCY*

Note: * Bold type indicates best factored items

Variable	Obs	Mean	Std. Dev.	Min	Max
Partner selection exploit	204,366	0.000	0.016	0.00	1.00
Partner selection explore	204,366	0.002	0.043	0.00	1.00
Firm size differential*	204,366	10.614	1.756	0.00	14.82
Firm age differential*	204,366	3.022	0.951	0.00	4.77
Firm knowledge differential*	204,366	0.759	1.607	0.00	6.86
Minority	204,366	0.000	0.019	0.00	1.00
Majority	204,366	0.001	0.024	0.00	1.00
JV	204,366	0.001	0.027	0.00	1.00
Market size differential*	204,366	1.622	1.104	0.00	6.51
Market growth differential	204,366	0.041	0.035	0.00	0.24
Geographic contiguity	204,366	0.065	0.247	0.00	1.00
Geographic distance*	204,366	8.890	0.700	5.09	9.88
Inverse Mills ratio	204,366	3.565	0.377	1.95	3.90
Previous alliance experience	204,366	0.162	0.933	0.00	10.00
Prior interactions	204,366	0.002	0.044	0.00	1.00
Cognitive distance	204,366	0.020	1.046	-2.80	2.09
Normative distance	204,366	-0.082	0.850	-1.25	4.45
Regulatory distance	204,366	0.252	1.017	-2.33	2.90

Table 3: Descriptive statistics

Note: Variables marked with an * have followed a logarithmic transformation.

No	Variable	1	2	3	4	5	6	7	8	9	10
1	Partner selection exploit	1.00									
2	Partner selection explore	-0.00	1.00								
3	Firm size differential	0.03*	-0.00	1.00							
4	Firm age differential	0.02*	-0.00	0.09*	1.00						
5	Firm knowledge differential	0.09*	0.02*	0.33*	0.10*	1.00					
6	Minority	0.36*	0.03*	0.01*	0.01*	0.04*	1.00				
7	Majority	0.44*	0.06*	0.02*	0.01*	0.06*	0.01*	1.00			
8	JV	0.37*	0.25*	0.03*	0.01*	0.08*	0.04*	0.17*	1.00		
9	Market size differential	0.01*	-0.01*	0.10*	0.01*	0.12*	-0.00	0.00	0.00	1.00	
10	Market growth differential	0.01*	-0.01*	-0.04*	0.04*	-0.06*	0.01*	-0.01*	-0.00	-0.02*	1.00
11	Geographic contiguity	-0.01*	-0.00	0.01*	-0.06*	-0.05*	0.00	-0.01*	-0.01*	-0.10*	-0.09*
12	Geographic distance	0.00	0.00	0.01*	0.04*	-0.01*	0.00	0.00	0.01*	0.07*	0.13*
13	Inverse Mills ratio	-0.12*	-0.05*	-0.25*	-0.17*	-0.74*	0.04	-0.08*	-0.08*	-0.08*	0.06*
14	Previous alliance experience	0.07*	0.01*	0.07*	0.05*	0.28*	0.01	0.02*	0.01*	0.017*	-0.02*
15	Prior interactions	0.76*	0.27*	0.03*	0.01*	0.08*	0.30	0.38*	0.45*	0.00*	0.01*
16	Cognitive distance	-0.02*	0.02*	-0.05*	-0.06*	0.01*	0.00	0.01*	-0.00	0.01*	-0.08*
17	Normative distance	-0.01*	-0.00	0.05*	0.02*	0.02*	-0.01*	0.00	-0.00	0.08*	-0.02*
18	Regulatory distance	-0.00	0.02*	0.00	0.03*	0.20*	0.00	0.01*	0.01*	0.11*	-0.07*

No	Variable	11	12	13	14	15	16	17	18
11	Geographic contiguity	1.00							
12	Geographic distance	-0.41*	1.00						
13	Inverse Mills ratio	0.06*	0.03*	1.00					
14	Previous alliance experience	-0.02*	-0.00	-0.37*	1.00				
15	Prior interactions	-0.01*	0.00	-0.12*	0.06*	1.00			
16	Cognitive distance	-0.00	0.02*	0.12*	-0.00	-0.01*	1.00		
17	Normative distance	-0.07*	0.00	-0.03*	-0.03*	-0.01*	-0.01*	1.00	
18	Regulatory distance	-0.08*	0.10*	-0.06*	-0.00	0.01*	0.15*	0.03*	1.00

Note: * denotes correlations significant at 5 percent or better

Table 4: Paired correlations

Variables / Models	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
	Exploit					Explore				
Firm size differential	0.13+ [0.08]	0.11 [0.08]	0.12 [0.07]	0.13+ [0.08]	0.10 [0.07]	-0.24+ [0.13]	-0.26 [0.16]	-0.26** [0.12]	-0.24+ [0.13]	-0.28+ [0.16]
Firm age differential	0.01 [0.21]	-0.04 [0.20]	0.01 [0.21]	0.00 [0.21]	-0.07 [0.20]	-1.19*** [0.24]	-0.45 [0.27]	-1.18*** [0.22]	-1.04*** [0.25]	-0.43 [0.26]
Firm knowledge differential	0.01 [0.09]	0.02 [0.10]	0.02 [0.09]	0.02 [0.10]	0.04 [0.11]	-1.31*** [0.28]	-1.58*** [0.23]	-1.34*** [0.26]	-1.20*** [0.28]	-1.54*** [0.23]
Minority	8.45*** [0.79]	8.45*** [0.76]	8.51*** [0.77]	8.41*** [0.78]	8.45*** [0.76]	-5.02*** [1.73]	-5.81*** [1.69]	-4.23** [1.76]	-5.46*** [1.56]	-5.65*** [1.67]
Majority	7.26*** [0.83]	7.08*** [0.57]	7.51*** [0.97]	7.15*** [0.81]	7.13*** [0.61]	7.71*** [1.15]	10.10*** [1.77]	8.65*** [1.24]	6.46*** [1.19]	10.58*** [2.04]
JV	4.77*** [0.53]	4.84*** [0.56]	4.92*** [0.54]	4.77*** [0.52]	5.03*** [0.57]	7.18*** [1.26]	8.25*** [1.29]	7.20*** [1.24]	6.77*** [1.27]	8.11*** [1.32]
Market size differential	0.07 [0.17]	0.05 [0.16]	0.04 [0.18]	0.06 [0.17]	0.03 [0.18]	-1.96*** [0.39]	-2.72*** [0.81]	-1.80*** [0.35]	-2.18*** [0.39]	-2.35*** [0.71]
Market growth differential	13.97*** [3.33]	9.59*** [3.35]	14.42*** [3.08]	13.71*** [3.32]	9.68*** [2.94]	-78.96*** [20.42]	-117.95*** [24.07]	-78.11*** [19.74]	-86.84*** [20.68]	-115.53*** [21.73]
Geographic contiguity	0.13 [0.72]	-0.21 [0.66]	0.13 [0.70]	0.16 [0.71]	-0.17 [0.65]	1.10 [0.96]	1.08 [1.76]	0.57 [1.01]	1.46 [1.03]	0.76 [1.78]
Geographic distance	-0.18 [0.21]	-0.25 [0.23]	-0.16 [0.21]	-0.15 [0.21]	-0.20 [0.21]	2.44*** [0.49]	2.66*** [0.96]	2.33*** [0.41]	2.77*** [0.50]	2.40** [0.97]
Inverse Mills ratio	-2.15 [0.343]	-2.10*** [0.41]	-2.14*** [0.34]	-2.14*** [0.36]	-2.06*** [0.45]	-9.87*** [0.98]	-11.07*** [1.43]	-9.92*** [0.99]	-9.07*** [0.95]	-10.62*** [1.50]
Previous alliance experience	0.34*** [0.05]	0.36*** [0.05]	0.35*** [0.05]	0.34*** [0.05]	0.36*** [0.05]	-0.31*** [0.11]	-0.58*** [0.13]	-0.37*** [0.12]	-0.26** [0.11]	-0.59*** [0.14]
Prior interactions	8.65*** [0.46]	8.85*** [0.51]	8.77*** [0.51]	8.66*** [0.46]	8.99*** [0.54]	4.77*** [0.49]	4.61*** [0.81]	4.67*** [0.51]	4.92*** [0.49]	4.52*** [0.75]
Cognitive distance		-0.47*** [0.12]			-0.45*** [0.13]		4.78*** [0.83]			4.76*** [0.91]
Normative distance			-0.29** [0.12]		-0.25** [0.12]			-0.68** [0.28]		-0.53+ [0.32]
Regulatory distance				-0.17** [0.08]	-0.10** [0.05]				1.53*** [0.18]	0.18 [0.28]
N	204,366	204,366	204,366	204,366	204,366	204,366	204,366	204,366	204,366	204,366
Pseudo R-square	0.745	0.754	0.746	0.748	0.756	0.666	0.730	0.666	0.704	0.740

Table 5: Institutional distance and partner selection for exploitation and exploration alliances. Rare-event logistic regression

Notes: The dependent variable (Exploit, Explore) equals 1 if the potential partner in the dyad is selected for an exploitation (respectively exploration) technological alliance, and 0 otherwise; All models include time dummies and an intercept, which not reported here due to space constraints; Standard errors are clustered on the dyad. +, ** and *** indicate variables that are significant at the 10%, 5% and respectively 1%.

Appendix.

Coding	Information	Year	Focal firm	Partner(s)
Exploration	Sumitomo will participate in technology exchanges with BTR-Dunlop via the global operations of the Dunlop Group	1993	Sumitomo Rubber Industries (Japan)	BTR-Dunlop (UK)
Exploration	This agreement aims at setting an industry standard and broadening the appeal and availability for run-flat tires; it consists of jointly operated R&D operations based in the Netherlands and license each other's respective run-flat technologies. Goodyear has developed run-flat technology that mounts on a conventional rim, while Michelin has an integrated wheel-and-tire system.	2000	Goodyear Tire & Rubber Co. (USA)	Group Michelin SA (France)
Exploration	Pirelli and Continental cooperate on developing new tyre truck technologies and have signed an off-take production agreement	2003	Continental AG (Germany)	Pirelli Group (Italy)
Exploration	Pirelli, Goodyear, Sumitomo, Hankook and Michelin cooperate on the development of Michelin's PAX run-flat tire-wheel system	2003	Group Michelin SA (France)	Pirelli Group (Italy)
Exploration	Nokian shares some of its tire technology with Bridgestone Corp. which holds 18.9 percent stake in the company.	2002	Nokian (Finland)	Bridgestone Corp. (Japan)
Exploitation	Pirelli Group has agreed to provide production technology and know-how to Alexandria Tyre Co. which plans to open a new production plant in early 1991.	1990	Pirelli Group (Italy)	Alexandria Tyre Co (Egypt)
Exploitation	Vredestein has signed a long-term agreement to licence the technology and production of Vredestein brand tyres to PT Elganperdana.	1997	Vredestein (Netherlands)	PT Elganperdana (Indonesia)
Exploitation	Sumitomo Rubber will provide turnkey and process technology on a contractual basis to Bonsa Tyre, Chongqing Tyre Factory and Liaoning Tyre via BTR Dunlop Ltd in South Africa, which is overseeing the former Dunlop International Technical and Trading Services in Birmingham, UK.	1997	Sumitomo Rubber Industries Ltd. (Japan)	Bonsa Tyre co Ltd (Ghana); Chongqing Tyre Factory (China); Liaoning Tyre (China).
Exploitation	Continental will outsource many of its motorcycle and scooter tires to Metro Tyres' dedicated new plant in Ludhiana, India. Also, the partners have signed long-term agreements covering both off-take production and technological support.	2002	Continental AG (Germany)	Metro Tyres Ltd (India)
Exploitation	Michelin has formed a joint venture with Tigar AD to make and market tyres and tubes in Yugoslavia. In addition Michelin will provide tire technology to Tigar AD.	2003	Group Michelin SA (France)	Tigar AD (Serbia)

Table 6: Examples of technological alliances considered and coding choices