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Overcoming institutional divides: Historical ties, economic integration policies, and the selection of partners for international technological alliances

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ABSTRACT

While management research documents a strong negative effect of institutional distance on cross-border interactions, we know relatively little about whether and how firms can overcome this snag. Using transaction costs and institutional arguments we posit that the negative effect of institutional distance on selection of international alliance partners will be weaken by the extent of informal (i.e., colonial duration) and formal (i.e., economic integration policies) ties between home-countries of prospective partners. The relative strength of these ties will reduce uncertainty and risks, as well as provide better mutual knowledge of partners' cognitive, normative, and regulatory backgrounds. Empirical results based on a panel of firms in the global tire industry and addressing endogeneity issues confirm these predictions. Our findings offer a more comprehensive view of international partner selection for alliances, attesting the role of institutions in this process and their interplay with the macro context of organizations which includes historical links and current economic policies.

1. Introduction

Strategic alliances provide organizations with multiple opportunities to engage in exploitation and exploration to improve their competitiveness (Lavie and Rosenkopf, 2006; Mukherjee et al., 2013; Bernal et al., 2022; Choi et al., 2022; Jacob, Belderbos and Lokshin, 2023). However, despite these advantages, alliances remain inherently risky (Park and Ungson, 2001; Heidl et al., 2014) and organizations need to establish a judicious selection of partners to avoid costly failures (Shah and Swaminathan, 2008; Findikoglu and Lavie, 2019). In an international context, a critical component of this selection process involves dealing with institutional idiosyncrasies of prospective partners that govern their behaviour and performance (Vasudeva, Spencer & Teegen, 2013; Dorobantu, Lindner & Müllner, 2019). Broadly, this institutional embeddedness has been encapsulated by scholars studying organizational interactions using the concept of "distance", i.e., cross-country institutional differences (Xu & Shenkar, 2002; Aguilera-Caracuel et al., 2013).

Prior research shows compellingly that greater institutional distance between prospective partners reduces their chances to partner up in an alliance. The needs and objectives of prospective partners differ substantially when comparing firms from different environments (Hitt et al., 2000, 2004). As such, the negative impact of institutional differences on the logic of partner selection manifests through both formal and informal channels such as the rule of law, control of corruption (Roy and Oliver, 2009), degree of marketization (Shi, Sun and Peng, 2012), corporatist structures (Vasudeva et al., 2013), culture, managerial practices, protection of intellectual property (Krammer, 2018) or political risk (Dorobantu et al., 2019). Notwithstanding this growing evidence on the *direct effects* of institutional differences on firm international strategies, there is still a paucity of comprehension regarding *whether* and *how* organizations can overcome these negative effects of institutional differences when engaging international partners.

The dearth of studies on this issue have focused exclusively on a handful of firm-specific explanations, such as internal capabilities (Henisz, 2003), ownership choices (Gaur and Lu, 2007) and international diversification (Chao & Kumar, 2010). In turn, we combine institutional (Kostova, 1999) and transaction costs rationales (Gulati and Singh, 1998) to argue that focal firms seeking to form alliances can effectively reduce the negative effects of institutional differences by

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selecting partners from countries with whom they have stronger *formal* (i.e., codified, mutually agreed and binding) and *informal* (i.e., tacit, serendipitous, exogenous, and non-binding) *ties* (Makino and Tsang, 2010).[1] Specifically, we theorize that the existence of strong formal and informal ties between countries will indirectly diminish a focal firm's coordination and appropriation concerns of otherwise institutionally distant partners, and moreover provide a better mutual understanding of their cognitive and normative backgrounds. As a result, powerful ties between home countries of prospective partners will reduce the overall uncertainty and risks stemming from institutional distance between them, making an alliance more appealing to the focal firm.

We test these hypotheses using a hand-collected panel that includes all firms in the global tire industry and their technological alliances between 1985 and 2003, complemented with data on formal and informal ties between countries. We follow prior literature (Makino and Tsang, 2010) and conceptualize the latter using the duration of colonial relations between countries, while for capturing the extent of formal relations we focus on the level of economic integration between two countries in the form of bilateral (i.e., economic integration agreements -EIAs-) and multilateral integration agreements (i.e., membership in the World Trade Organization -WTO-, or its precursor, the General Agreement on Tariffs and Trade- GATT). The longitudinal dimension of our dataset allows us to capture the rise of bilateral and multilateral economic integration around the world because of increased flows of trade and foreign investments due to globalization (Rodrik, 2000; Baier et al., 2008). Moreover, our empirical analysis accounts for potential endogeneity between institutional distance and the formal and informal country ties.

We propose several contributions. First, we extend institutional theory by advancing two important macro contingencies that can help organizations mitigate the negative effects of institutional distance, namely formal (economic) and informal (colonial) ties between countries. We contend that the relative strength of these ties lessens the liability of foreignness experienced by focal firms when engaging institutionally distant partners through reducing the perceived uncertainty (Zhang and He, 2013) and ensuring greater familiarity with cognitive and normative backgrounds of prospective partners (Feasel and Kanazawa, 2013). We thus complement theoretical insights (Hagedoorn, Letterie & Palm, 2011) as well as prior evidence regarding firms' strategies for dealing with institutional distance (Delios & Beamish, 2010; Chao & Kumar, 2010).

Second, we answer multiple calls by management scholars (Jones and Khanna, 2006; Klüppel, Pierce & Snyder, 2017; Wadhwani et al., 2018) to "bring back history" into the field by examining the potential effects of historical ties between countries on contemporaneous firm strategies. Apart from their perennial implications for economic performance (Acemoglu, Johnson & Robinson, 2001), trade (Head, Mayer & Ries, 2010), cross-border investments (Makino and Tsang, 2010) and social development (Feyer & Sacerdote, 2009), colonial ties have been shown to affect organizations by shaping competitive advantage (Frynas, Mellahi & Pigman, 2006), supporting legitimacy (Jones, 1996), and triggering certain strategic responses (Chakrabarty, 2009). We expand this body of work on historical insights by showing how *the extent of historical links* between countries, in the form of colonial duration, provides important, and often omitted, insights into current business interactions, specifically international technological alliances (Parkhe, 2003).

Third, we contribute to the ongoing debate on the benefits and pitfalls of economic integration and more broadly, globalization (Rodrik, 2000)- a conversation which has been recently reignited due to a surge in nationalism and protectionism around the world (Witt, 2019) and more recently due to the COVID-19 crisis (Espitia et al., 2020; Krammer, 2022). Specifically, we focus on the indirect and positive impact of having formal, codified links of economic nature and show that both bilateral (e.g., EIAs) and multilateral (WTO/GATT) economic ties between countries can reduce the negative consequences of institutional distance, complementing prior findings on the importance of such policies for firm international success (Frantianni & Oh, 2009; Alhorr, Moore & Payne, 2008).

Finally, our insights fill in the sparse knowledge on the selection of international partners (Hitt et al., 2004; Roy and Oliver, 2009; Dorobantu et al., 2019) by drawing attention to the contextual and historical macro-environment of firms as a salient consideration for selection choices in technological alliances. While previous studies in this area have mostly focused on firms' degree of compatibility, complementarity and commitments (Gulati, 1995; Rothaermel and Boeker, 2008; Robson et al., 2019), we make the case that, in addition to these important firm- and alliance-specific factors, the macro-institutional context and bilateral country-level relationships are just as important for international inter-firm interactions (Liu & Nicholson, 2017; Arikan et al., 2020).

2. Theory and hypotheses

2.1. Technological alliances for exploitation and exploration

Past decades witnessed a significant increase in the number of inter-firm alliances, many involving transfers of technology and international partners, as avenues to achieve and maintain competitive advantage (Anand and Khanna, 2000). Formally defined as inter-firm cooperative agreements designed to impact the long-run product and market positioning of partners (Hagedoorn, Cloodt & Van Kranenburg, 2005), technological alliances remain an important vehicle for procuring external resources (Furlotti and Soda, 2018), reducing the inherent risks associated with research and development (R&D) activities, as well as buffering against mounting pressures from competitors (García-Canal et al., 2008). Recent findings in the literature relate alliance formation with multiple technological and know-how benefits for partnering firms, such as cross-learning (Subbramanian, Bo, and Kah-Hin, 2018), vicarious learning through networks (Duysters et al., 2020), higher patenting intensity (Li et al., 2019), product development rates (Frankort, 2016) or performance ex-post an acquisition (Zhou et al., 2023).

Acknowledging the use of alliances for both exploitation and exploration purposes (Lavie and Rosenkopf, 2006), previous studies have applied the organizational learning framework of March (1991) to examine alliance formation. Thus, firms may form *exploration alliances*, forged with the explicit purpose of discovery and development of innovative technologies (e.g., R&D alliances, technical cooperation agreements), or *exploitative ones* (e.g., licensing deals, supply agreements) that target an efficient utilization of existing technological assets and complementary resources (Koza & Lewin, 1998). Ultimately, this choice between exploration and exploitation alliances is a result of complex interactions between firm's strategic intent, learning objectives, and the expected returns of these partnerships (Yamakawa et al., 2011; Choi and Contractor, 2016; Degener, Maurer & Bort, 2018). Despite this distinction, in practice, firms often balance the conflicting needs for exploration and exploitation and develop ambidextrous portfolios which include both types of alliances (Lavie and Rosenkopf, 2006). In addition, existing work on ambidexterity suggests that exploration and exploitation can have a joint positive influence on firm

[1] For example, in 1997 Vredestein, a Dutch tire producer, has signed a long-term agreement to license the technology and production of its brands to PT Elganperdana, an Indonesian firm. Indonesia was a Dutch colony for almost 350 years until 17 August 1945 when it unilaterally declared its independence. Similarly, BTR Dunlop and Avon Tyres (two UK MNEs in the tire industry) had in 1994 multiple technology transfer agreements with tire producers from countries with historical links to the UK like India (Vikrant), Ghana (Bonsa), Turkey (Petlas), Sri Lanka (Kelaniya) or Pakistan (Delta). Continental AG (Germany) was also active in its alliance activities with firms from Central and Eastern European countries that it had historical affinities with, like Poland (Stomil) or Slovenia (Sava).

performance relative to other competitors that focus exclusively on one or the other (He and Wong, 2004; Gibson and Birkinshaw, 2004; Seo et al., 2023).

2.2. Selection of partners for alliances

Given the aforementioned benefits, the growing prevalence of alliances in many industries is not surprising. However, empirical findings suggest that more than half of these alliances tend to end up in failure (Park and Ungson, 2001), prompting more examination on why and how certain firms are more successful than others when it comes to managing partners and alliances (Li et al., 2008). One of the prominent answers to this question focuses on the selection process of partners as an intrinsic criteria for alliance success both in theory (Geringer, 1991) and managerial practice (Glaister, 1996). A good selection procedure involves significant search and screening costs alongside strong commitments to collaborate and adapt to meet the objectives of a proposed alliance between two otherwise different and complex organizations (Gulati, 1995).

Within this vein of literature, previous studies assert complementarity to be an important factor for partner selection and, subsequently, alliance survival and success. Thus, firms may seek partners that have significant breadth in terms of markets, technological competences (Krammer, 2016), resources and capabilities (Furlotti and Soda, 2018), or knowledge domains (Yayavaram et al., 2018). Moreover, in the context of fast paced, high-tech industries established firms may use alliances with new entrants to adapt to technological change, while new entrants benefit from larger commercialization of their new disruptive technologies (Rothaermel and Boeker, 2008). Nevertheless, different needs of firms can be traced back to their home environments' idiosyncrasies. For instance, Chinese firms tend to focus more on long-term gains from partnerships through the level of intangible assets of prospective partners, in contrast to Russian firms which tend to care more about short-term prospects such as access to financial capital and complementary capabilities (Hitt et al., 2004). Finally, complementarity may or may not be desirable based on the proposed function of the alliance. So, while greater differences in the product space can be beneficial for exploration, technological differences between partners can hamper exploration (Krammer, 2016).

While *complementarity* is the primary logic for partner selection, for alliances to thrive, partners must also be *compatible*. Thus, sharing of common traits such as skills, routines, and work culture between partners increases the success of an alliance (Dacin, Hitt & Levitas, 1997; Glaister, 1996). Access to complementary resources and opportunities for organizational learning are two key drivers of alliances formation, meant to enhance firm capabilities (Hitt et al., 2000). Moreover, status similarity, as well as social capital arising from prior collaborative experiences have strong effects on alliance formation (Chung et al., 2000) although more recent evidence suggest that these benefits tend to peter out as similarity surpasses certain thresholds (Luo and Deng, 2009).

In addition to complementary and compatibility issues, firms with prior experience in managing such partnerships (Anand and Khanna, 2000) and those having a dedicated "alliance function" (Kale et al., 2002) tend to do better in managing and coordinating these relationships (Kale & Singh, 2009) as well as selecting the appropriate partners for their particular needs (Degener et al., 2018). While managers may often prefer new and distant partners over existing and closer ones, board monitoring mechanisms mitigate this effect (Kang and Zaheer, 2018). Finally, development of learning processes, which commonly involve the sharing and codification of practices that are specific to alliance management, improves significantly their success rates (Kale and Singh, 2007).

2.3. Institutional distance and the selection of international alliance partners

While the above firm- and relationship-specific criteria may dominate partner selection rationales in a domestic context, in an international one, alliances need to also overcome numerous idiosyncratic differences between home countries of partners (e.g., regulations, development levels, cultural aspects, HR practices, human capital available, tax regimes, infrastructure, etc.). These differences stem from their social, economic, and political configurations (Parkhe, 2003) and seldom can be sizeable. Chief among them, institutional factors have been found to be particularly relevant for firms' international strategies (Brouthers and Brouthers, 2000; Dorobantu et al., 2019).

Institutions have an essential role in supporting the proper functioning of markets by reducing the risks and costs associated with interfirm transactions (North, 1990). These societal rules of conduct are reflected in firms' strategies (Hitt et al., 2000), as the mechanisms that govern them are embedded in the broader political and social context, which shapes the way firms do business, manage resources, or interact with governments, clients, and other firms (Scott, 2001). Commonly, these formal and informal aspects are conceptualized in the form of three institutional "pillars" (Scott, 2001). The cognitive and normative pillars tend to focus on the informal and tacit facets of institutions, guiding indirectly firms and individuals to interpret information and react to different stimuli based on a set of beliefs, frameworks, and inferences about how the world should and does operate (Kostova and Zaheer, 1999). Complementarily, the regulatory pillar of institutions focuses on codified rules and regulations that govern interactions within society (Meyer et al., 2009).

For this study, we seek to focus on the contingencies of the relationship between institutional distance and partner selection for alliances. The few studies in this particular area have mostly focused on the direct effect of distance on the appeal of partners. Thus, qualitative evidence suggests that US and Korean managers may share similar motives for entering alliances, but have different expectations on the benefits of these agreements (Dacin et al., 1997). Moreover, while emerging market firms (EMFs) emphasize financial and technological assets, quality and willingness to share expertise, developed market firms (DMFs) seek unique competencies, market access, learning opportunities, attractive industries, and cost advantages (Hitt et al., 2000). Moreover, these cross-border differences are persistent even among EMFs, as shown by Hitt et al. (2004) who contrasted the expectations of Chinese versus Russian managers regarding their alliances.

Other investigations have focused on assessing quantitatively the effects of institutional context on the logic of partner selection. Thus, Roy & Oliver (2009) posit that the selection of partners for international joint ventures is influenced by their formal institutional background, namely the rule of law and provisions for the control of corruption. These institutional effects can be also traced at sub-national levels as equally important criteria, as shown by Shi et al. (2012) who examine the effects of the degree of marketization in a region on JV international partner selection using a sample of Chinese electronics and IT firms. Similar findings focus on other institutional explanations such as differences in terms of the corporatist structures (Vasudeva et al., 2013) or environmental complexity (Mukherjee et al., 2013) and their effect on alliance strategies. Finally, Krammer (2018) analyzes whether the appeal of an institutionally distant partner for an alliance is contingent on the objective of the alliance, i.e., exploitation or exploration. He shows that while greater institutional distance is perceived to be detrimental to MNEs seeking to exploit their technological assets, it is desired (i.e., has a positive effect in terms of partner selection) when it comes to exploration alliances. Thus, the effects of institutional distance are asymmetric and contingent on the alliance function.

Overall, these studies confirm that MNEs forming international alliances should be mindful of both selection criteria and a priori expectations. Moreover, they also point out that the relationship between

institutional distance and selection of partners is a rather complex one with many contingencies. Taking stock of these findings, we investigate on *how firms may overcome institutional distance when it comes to alliance partner selection in an international context*. We will focus only selection of partners for *exploitation* as previous studies have both theorized and confirmed empirically clear negative effects of ID for these types of alliances, as opposed to those of explorative nature (Rothaermel, 2001; Yang et al., 2014; Krammer, 2018; Duysters et al., 2020; Zhou et al., 2023).

Specifically, when it comes to technological alliances for exploitation, there are several reasons for which focal firms will prefer partners from closer or similar institutional environments (i.e., less distant). First, larger cognitive and normative distance between prospective partners will involve higher coordination costs because of greater mismatches in terms of operation, management, and technological capabilities (Delerue and Simon, 2009; Gulati and Singh, 1998), all of which will reduce their appeal as an alliance partner. Second, larger cognitive and normative differences will significantly impede the flow of technological expertise between prospective partners, as this is often embedded into people and organizations (Volkoff, Strong & Elmes, 2007). Such differences will lower the appeal and trust regarding technological sharing (Michailova and Hutchings, 2006) therefore reducing the appeal of such an alliance. Finally, focal firms will prefer to select partners from countries with similar or better regulatory environments for exploitation alliances to minimize appropriation concerns vis-à-vis imitation or technology leakage (Pisano, 1990) and ensure a smooth flow of technological know-how to their partner (Gans et al., 2008) by sharing compatible IPR standard and similar absorptive capabilities in the form of supporting national and regional institutions (Krammer, 2009).

Together, these arguments suggest that institutionally distant partners may entail additional costs and resources to bridge these differences, which makes them less appealing for an exploitative technological alliance. Subsequently, we incorporate these rationales and examine the potential role of formal and informal ties between the home countries of prospective partners in mitigating these negative effects of institutional distance on partner selection for exploitation alliances.

2.4. The moderating effect of informal (colonial) ties between countries

Informal ties are a result of exogenous events (e.g., geographic proximity, migration, colonization) that result in closer cultural, ethnic, and social relations between individuals and countries (Makino and Tsang, 2010: 546). Less employed in management research, informal ties between countries could provide important "omitted insights" in explaining present organizational interactions, particularly in an international context (Makino and Tsang, 2010; Witte et al., 2020).

Subscribing to this view, we propose that the extent (duration) of colonial ties will weaken the negative effects of institutional distance on focal firm's selection of alliance partners for several reasons. First, the extent of colonization process creates a *deep mutual knowledge* of the cognitive and normative characteristics between colonizer–colony pairs of otherwise dissimilar countries. This knowledge of each other's values and norms is mostly tacit and gets accrued over time (Makino and Tsang, 2010) at different societal levels, including individuals, firms, and governments (Jones, 1996). In the case of alliances, this additional knowledge may alleviate the existing institutional mismatches between partners (Delerue and Simon, 2009) and the lower levels of trust and cooperation (Michailova and Hutchings, 2006), both of which are needed for a successful alliance. Thus, lengthier colonial links between countries will alleviate some of the technology transfer problems that come with distant cognitive and normative partners. This reduction in perceived coordination costs will therefore make partners from countries with whom focal firm's country shared a colonial past more appealing than otherwise.

Second, colonial ties will stimulate inter-firm interactions by *lowering uncertainty and transaction costs* associated with alliance activities. In-depth knowledge of cognitive and normative elements of a country, acquired through lengthy colonial relations, results in less uncertainty and clearer expectations from the focal firm regarding partnering firms, thereby facilitating the selection of appropriate partners (Rangan & Segul, 2009). These expectations will already be embedded in focal firm's ex-ante partnering decisions as it will have a better understanding of such partners and more realistic expectations of the risks and rewards associated with forming an alliance with partners that share these colonial links. As a result, the focal firm will be able to both better assess transaction costs ex-ante, as well as better manage them ex-post by tapping into this in-depth knowledge acquired via extensive historical interactions (Makino and Tsang, 2010). In this way, focal firms will be able to deal effectively with existing cognitive and normative differences for partners from countries that have shared extensive colonial ties.

Finally, colonial ties will also be able to moderate the effects of institutional distance between countries through *shared regulatory elements* because of countries' *common legal traditions*. Legal traditions have been introduced in different countries through military conquest and colonization from a handful of homelands to the rest of the world (Watson, 1974). They provide the basic legislative principles of a country, and differ in terms of legal codes, principles, ideologies, and judicial organizational elements (i.e., French, German, Socialist and Scandinavian). Albeit countries with the same legal traditions can still be quite different in terms of overall institutions, lengthy colonial ties between them ensure that they have a significant common regulatory base (La Porta et al., 2008). Such a common base provides additional familiarity and confidence to the focal firm in the regulatory environment of a prospective partner, lowering the perceived appropriation concerns vis-à-vis a potential alliance, where technology leakages (Pisano, 1990) and technology transfer frictions (Gans et al., 2008) can significantly reduce the appeal of a regulatory-distant partner. Subsequently, colonial ties will mitigate the negative effects of institutional distance manifested through greater regulatory differences.

In view of all the arguments above we propose that.

H1. The duration of colonial ties between the home countries of the focal firm and its prospective partner will negatively moderate (i.e., weaken) the negative effects of cognitive, normative, and regulatory distances on partner selection.

2.5. The moderating effect of formal (economic) ties between countries

Besides informal ties between countries that occur because of exogenous factors, formal ties are also emerging, as countries adopt intentionally certain preferential relationships (i.e., agreements, treaties) to promote mutual interests (Makino and Tsang, 2010). These formal relations may differ in terms of objective (e.g., economic – European Union, political – United Nations, environmental – Kyoto protocol, or military – North Atlantic Treaty Organization) and scope (i.e., bilateral or multilateral), but they all share a *codified structure* and *clear enforcement mechanisms* that warrant their uniform implementation across all signatory parties.

Global economic integration has been accelerating over the past decades. The GATT, founded in 1947, and its successor the WTO, remain the world's largest (164 members to date) inter-governmental platform that functions as a *multilateral economic agreement* to promote free trade with provisions for contingent areas of interest, such as industrial subsidies or intellectual property rights. In parallel, there is a rapid proliferation of *bilateral* EIAs, which promote regionalism through preferential treatment regarding the exchange of goods, investments, and people between partnering countries (Baier et al., 2008). Both types of agreements bear important implications for the signatory countries, and previous studies suggest that they increase significantly trade (Baier et al., 2008) and capital flows (Alhorr et al., 2008; Chen, 2009), while reducing domestic barriers for international business (Zhang and He,

2013).

We posit that the extent of economic ties between countries will reduce the negative effects of institutional differences on partner selection in alliances through several mechanisms. First, economic ties will lower the focal firm's appropriation concerns in an alliance through their *formal nature* and their *strict enforcement mechanisms*. Formalized economic agreements between the home countries of prospective partners provide a significant buffer for appropriation concerns, as they signal irreversible commitments at the national level to adopt and uphold international regulatory standards. Moreover, breaches of these provisions are subject to severe penalties from economic partners (in the case of bilateral EIAs) or the rest of the world (GATT/WTO). Therefore, when it comes to partner selection for alliances, given the formal nature and significant power of enforcement behind strong economic ties between countries, they can successfully mitigate the effects of institutional differences between focal firms and prospective partners.

Second, the *codified nature* of these agreements provides focal firms with better information regarding the regulatory standards in the home countries of partners, thereby reducing the informational asymmetry and uncertainty it faces when dealing with alliance partners from institutionally distant markets. For instance, a critical regulatory criterion for focal firms when choosing a market is the strength of intellectual property regimes (Khoury and Peng, 2011), with ubiquitous implications when it comes to technological alliances (Hagedoorn et al., 2005; Krammer, 2018). Both the GATT/WTO and many EIAs cover aspects related to IPR (Kohl et al., 2016), implicitly reducing the gap between the legislative treatment ("de jure") and the actual enforcement ("de facto") of IPR laws in an international context. Hence, for the focal firm, having a partner from an economically integrated country will lower the risks (e.g., of losing equity, leaking technologies) of such alliance, given the clear and enforceable provisions regarding sensitive issues, such as IPR. Subsequently, this will increase the appeal of such partners, offsetting the negative effects of their distant institutional backgrounds.

Third, appropriation and coordination concerns of focal firms will be further escalated by *nationalist views* and *security constraints*, which can interfere with otherwise sensible market transactions. For instance, cross-border alliances often require formal approvals from national governments (e.g., adhering to antimonopoly regulations, accessing joint public–private R&D programs or benefitting from tax incentives) that are particularly sensitive to nationalistic views and sentiments towards the focal firm or its home country (Nigh, 1985). We posit that economic ties between home countries of focal firms and their prospective partners will contribute towards forming favourable *public opinions* and *sentiments* towards these foreign entities (Feasel and Kanazawa, 2013; Li et al., 2019). While these views will transcend societies, they will also frame generic business interests and executive decisions (Kuno and Naoi, 2018). Thus, strong economic ties will have the potential to moderate the negative effects of cognitive-normative dissonances between the home countries of firms, thereby increasing the attractiveness of prospective partners.

Finally, strong economic ties will also trigger *spillovers* to contingent institutional domains, those that are not explicitly covered by these agreements; in turn, this will also lower the focal firm's coordination costs and appropriation concerns regarding an alliance partner from an economically connected foreign country. Economic ties benefit from powerful constraints (i.e., official, explicit, and binding) and significant penalties in the case of failures to comply. Together, these mechanisms ensure the greater conformity of all signatory parties to the prescriptions of these agreements, and, in turn, this conformity is often transplanted in other contingent areas of interest.[2] Moreover, in addition to their effects in the regulatory domain, economic ties will also expose countries to foreign partners' normative and cognitive traits, thereby enhancing trust at all societal levels and increasing economic cooperation between firms and individuals from economically linked nations (Feasel and Kanazawa, 2013). Through this integration process, firms from different countries become familiar with each other's normative (e.g., management style, decision process, organizational structures, etc.) and cognitive (e.g., language, work ethics, risk attitudes) characteristics, and can adapt to them more effectively (Beechler and Yang, 1994). This lowers relational risks for prospective partners coming from signatory countries, providing additional motivation for the focal firm to select them for a technological alliance.

Based on all the above arguments, we hypothesize that.

H2. The extent of economic ties between the home countries of the focal firm and its prospective partner will negatively moderate (i.e., weaken) the effects of cognitive, normative, and regulatory distances on partner selection.

We summarize our conceptual model in Fig. 1 below.

3. Method

3.1. Data, setting, and sample

To test these hypotheses, we use data from the global tire industry hand-collected from various issues of an industrial journal titled the *European Rubber Journal* (ERJ). This industry which provides with an ideal setting for testing our hypotheses given its international representation (70+ countries), the richness of horizontal alliances (Phelps, 2010), and technological focus among top firms (Acha and Brusoni, 2005). Historically, the origins of the tire industry can be traced back to the industrial revolution era in the 19th century Britain and break-through innovations like the vulcanization process by Charles Goodyear (1839) and the pneumatic tire by R.W. Thomson (1846). Driven by both an increase in automobile demand as well as significant technological and production advancements, the industry has grown to encompass today more than 300 factories worldwide that produce more than 1 billion units annually.

We compile a longitudinal dataset of all tire producers worldwide manually collected from various issues of *ERJ*. Also, from *ERJ's* annual Global Tyre Report we collect data on the horizontal alliances between firms in the global tire industry which is available only between 1985 and 2003 (when it was discontinued) including text on the details around each alliance, its objectives and its time horizon (if an end date is specified). Using this text, we are able to determine whether the purpose of the alliance is exploration or exploitation of existing technological assets.

We then construct a dyadic dataset employing *all possible pairs or dyads* of two firms in the industry and we code realized (actual) technological alliances for exploitation as 1 (i.e., when the two firms in the respective dyad form an exploitation technological alliance) and 0 otherwise (see below the DV section for more details). In this way we are able to capture correctly the partner selection process by allowing in our dataset both rejection of certain partners (i.e., dyads with a "0" outcome or no alliance formed) and selections of other partners (dyads with a "1" outcome, meaning an alliance was formed).

We collect additional data for both members of the dyad on basic firm characteristics -i.e., size, age and ownership type- (ERJ) and firm patents (Derwent Innovation Index- ISI Thomson) from which we compute a knowledge stock using the perpetual inventory method and the common (15%) depreciation rate in this literature (Griliches, 1990). Using a patent-related measure to capture knowledge stock fits well with our institutional arguments towards appropriation concerns and difficulties in knowledge transmission in the case of institutionally distant partners. Furthermore, Derwent Innovation Index covers 14 million inventions from almost 60 world-wide patent issuing authorities, making

[2] For instance, although a bilateral FDI treaty between two countries is likely to focus on key investment provisions such as protection of investments, dispute settlement, etc., it will also stimulate convergence in terms of other regulatory aspects (e.g., labour or IPR regulations) that are important for foreign investors.

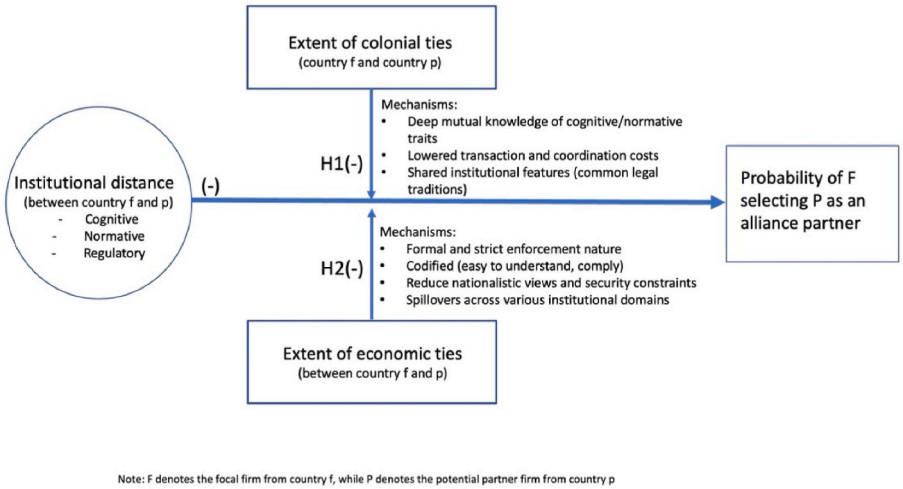


Fig. 1. Conceptual model.

it a better choice than a single patent office (e.g., USPTO, EPO) given our international scope in terms of origins of firms. Finally, despite the maturity of the industry and overall low R&D intensity, lots of technological developments are still undergoing in the tire industry, as reflected by patenting activities (Acha and Brusoni, 2010). An overview of the most common technological classes for patents in this industry in provided in Table A.3 in the Appendix. Firms for which information on size, age, ownership is not available are excluded from the sample. Furthermore, some firms (and subsequently their dyadic combinations) enter later than 1985 in our data (new firms) and others exit (go out of business or get acquired etc.) all of which results in an unbalanced longitudinal dataset of dyads at the firm-level. The final dataset is about 204,000 dyadic observations over the period of 1985–2003.

Dependent variable. Following prior operationalization schemes in the literature (Koza & Lewin, 1998; Lavie and Rosenkopf, 2006; Yamakawa et al., 2011), we define *exploitative* alliances as agreements involving "the use and development of things [i.e., technologies] already known" (March, 1991) and consider several types of agreements (i.e., long-term agreements involving joint marketing, service, OEM, licensing, supply and joint-production deals) in which the focal firm provides existing technologies to its partners in exchange for other non-technological benefits (e.g., access to production facilities, services, financial gains, etc.). Using the text provided by the ERJ, we code our dependent variable (*Partner selection*) as a binary one that equals 1 if the two firms in a dyad form a cross-border technological alliance for exploitation in a year, and zero otherwise.

In all dyads, we code the focal firm as the first one (i.e., the provider of technology) and list the second firm is the recipient of technology via the alliance. For dyads in which firms do not form a technological alliance (i.e., there is no alliance announcement), we consider arbitrarily the focal firm to be the one with greater potential for technological exploitation within a given dyad, i.e., the larger knowledge stock (number of granted patents) of the two firms in the dyad. If both firms have the same number of patents, we arbitrarily consider the first firm listed in the dyad to be the focal one. In the case of firms that do not have any listed patents in Derwent database, we assume their technological knowledge stock to be zero.

Independent variables. In line with previous studies (Gaur et al., 2007; Parboteeah et al., 2008; Estrin, Baghdasaryan & Meyer, 2009; Zhou et al., 2023), we measure *cognitive* (institutional) differences between countries using national culture values, since these have been closely linked to alliance activities (Steensma et al., 2000; Delerue and Simon, 2009). Empirically, we compute a cultural distance using the Mahalanobis distance formula applied to Hofstede's five dimensions of culture (Hofstede, Hofstede & Minkov, 2010). We opted for a Mahalanobis computation since it benefits from being scale-invariant and accounting for the variance-covariance matrix of components, as opposed to other popular options in the literature such as Euclian distance or the popular Kogut and Singh (1988) formula (for a discussion of these distances and their particularities see Beugelsdijk et al., 2020).

For computing differences in terms of *normative* institutions we use data on managerial practices from IMD's World Competitiveness Yearbook (Xu et al., 2004; He et al., 2013). This follows closely Scott's (1995) definition of normative institutions, which focuses on informal aspects that document how (business, in our case) should be done, or conducted legitimately and in accordance with the norms of that jurisdiction or country. Therefore, our conceptualization encompasses the normative managerial aspects of institutions that will govern alliance operations. To derive our measure of *normative* institutions we perform factor analysis (see Table A1, Appendix) and derive one indicator from seven items related to managerial practices (Cronbach alpha = 0.93) using the principal component method (Eigenvalue = 4.53). We then compute differences across countries using a one-dimensional Mahalanobis formula.

Table 1
Descriptive statistics.

Variable	Obs.	Mean	Std. Dev.	Min	Max
Partner selection exploit	204,312	0.002	0.04	0.00	1.00
Size differential*	204,312	10.615	1.76	0.00	14.82
Age differential*	204,312	3.021	0.95	0.00	4.77
Knowledge differential*	204,312	0.761	1.61	0.00	6.86
Product differential*	204,312	0.982	0.55	0.00	2.20
Unionization differential	204,312	0.529	0.50	0.00	1.00
Ownership differential*	204,312	0.008	0.09	0.00	1.00
Minority	204,312	0.000	0.02	0.00	1.00
Majority	204,312	0.001	0.02	0.00	1.00
JV	204,312	0.001	0.03	0.00	1.00
Previous alliance experience	204,312	0.163	0.94	0.00	10.00
Prior interactions	204,312	0.002	0.04	0.00	1.00
Market size differential*	204,312	1.622	1.10	0.00	6.51
Market growth differential	204,312	0.041	0.03	0.00	0.24
Geographic contiguity	204,312	0.065	0.25	0.00	1.00
Geographic distance*	204,312	8.889	0.70	5.09	9.88
Schooling differential	204,312	3.466	2.34	0.00	9.69
Resource differential*	204,312	8.926	6.29	0.00	15.10
Colonial duration (COL)*	204,312	0.299	1.24	0.00	6.10
Cognitive distance (CD)	204,312	0.020	1.05	−2.80	2.09
Normative distance (ND)	204,312	−0.082	0.85	−1.25	4.45
Regulatory distance (RG)	204,312	0.250	1.02	−2.34	2.90
EIA	204,312	0.123	0.33	0.00	1.00
GATT/WTO	204,312	1.857	0.35	0.00	2.00

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

Finally, our third institutional measure focuses on *regulatory* distance between countries. Since the focal phenomena of our study is technological and exploitative in nature, we believe that the most important regulatory aspect in this case should capture the ability of focal firms to protect and appropriate value from their technological assets. As such, we focus on intellectual property rights (IPR) to derive a measure of *regulatory* distance using data on the strength of IPR protection from Park (2008). Different from the cognitive and normative aspects of institutions where the direction of the distance does not matter (Zaheer et al., 2012) - i.e., we cannot say a culture is better than another one, we can only say that they are different and to what extent-, in the case of regulatory institutions distance is relevant (i.e., a partner can have lower or higher IPR protection that the home country of a focal firm). Subsequently, to accommodate these nuances, we operationalize regulatory distance as a simple difference between the degree of IPR protection of the focal firm's country minus the IPR protection of the country of the prospective partner; in this way, we allow for asymmetry and ranking in terms of strength regulations as per our theoretical priors (Zaheer et al., 2012).

The extent of informal ties measured the number of years of colonial ruling between home countries of firms in a dyad (*colonial duration*). We compute an index of the extent of colonial relations for 224 countries following Olsson (2009). For more details, please see Olsson's (2009) discussion on the definition of the colonial duration and its conceptualization (p.536) as well as the historical events considered on a country-by-country basis (Appendix A). We capture both bilateral and multilateral *economic ties* using two variables: (1) the GATT/WTO membership within a dyad (*GATT/WTO*) which can take the value of 2 if both countries in the dyad are members in GATT (prior to 1995) or WTO (after 1995), 1 if only one country in the dyad is a member, and 0 otherwise; and (2) the Economic Integration Agreements (*EIA*), coded as 1 if there is an EIA between the two nations in the dyad, and 0 otherwise.[3]

Controls. We consider an extensive batch of controls that includes both firm- and country-specifics which can explain partnering preferences within the industry. With regards to the former, we use data on production to compute firm *size differential* and data on establishment for firm *age differential* both serving as proxies for market success and experience (Gulati, 1995) as drivers of potential for alliances. Moreover, since we are looking at technological alliances for exploitation, we also compute firm *knowledge differential* using firms' annual patent stocks and a standard 15 percent annual depreciation rate (Griliches, 1990). The rationale behind this is that greater technological imbalances between members of a dyad will provide more opportunities for exploitation of technological exploitation. In addition, we include the *previous alliance experience* using a 3-year window (Annand and Khanna, 2000), a *prior interactions* dummy for the dyad (Kale and Singh, 2007), as well as any equity links between the firms in the dyad using several dummies (*majority*, *minority* ownerships or *joint-ventures*). Prior literature suggests that similarity in terms of product portfolios might be inductive when it comes to alliance or acquisition decisions (Wang and Zajac, 2007). Furthermore, differences in terms of unionization (Brunello, 1992) and ownership (Li et al., 2017) profiles could entail additional adaptation costs and frictions which otherwise would deter from the appeal of a prospective partner. Hence, we consider also *product differentials* as simple differences in terms of number of tire types produced,[4] *unionization differentials* which is a dummy variable that captures whether the two firms in a dyad are both unionized or non-unionized (equals one then, and zero otherwise) and *ownership differentials* measured again using a dummy which equals one if both firms in a dyad are either private- or state-owned, and zero if one is private and one is state-owned.

At the country level, we include both *market size differential* and *market growth differential,* subscribing to the idea that focal firms will be attracted towards partners from larger and more dynamic markets than their own, as in these particular contexts they will have more opportunities to capitalize on their technological assets via exploitation alliances. We compute these two variables using data on firms' home countries GDP, extracted from the World Penn Tables (Feenstra et al., 2015). In addition, from the CEPII database, we employ a continuous measure of *geographic distance* and dummy variable for *geographic contiguity* (i.e., whether two home countries of firms share a border or not) to control for any significant "border effects" (Schulze and Wolf, 2009). With these two proxies we want to capture the effects of geography on international alliances. We also include a dyadic measure of *schooling differential* as the difference between average schooling years in the home countries of firms from Barro and Lee (2013), and a measure of *resource differential* based on the countries' yearly production of natural rubber (value in constant USD) drawn from FAOSTAT (The Food and Agriculture Organization Corporate Statistical Database). The intuition behind these controls is that larger differences in terms of human capital (schooling levels) might deter partnerships while greater differences in terms of natural resources (i.e., rubber) might induce them. Although the tire industry has increasingly employed synthetic rubber for its products, natural rubber remains a core ingredient for tires, and one with properties (in terms of flexibility, insulation and resistance) that are yet to be matched by its synthetic substitutes (Etracks, 2022). Finally, we add time dummies throughout all our models to capture changes over time.

3.2. Empirical analysis and addressing endogeneity

Given the binary nature of our DV our preferred choice of estimation was originally a probit model. However, in addition, there is also a potential endogeneity concern, as our main IDVs and the moderators might be interdependent. For instance, we know that the development of modern institutions has been greatly influenced by exogenous factors like geography, genetics, or serendipitous historical events like colonialization (Acemoglu et al., 2001; La Porta et al., 2008; Olsson, 2009). Subsequently, colonial past may also affect directly institutional distance between two countries by setting in the past common institutional framings which have effectively reduced ID between the two countries during the colonial period. After independence, some of these elements have persisted and others may have been abolished, while other factors (including economic, social and political idiosyncrasies) have further shaped the level ID to the levels we observe today. Similarly, integration agreements such as EIAs or WTO membership may also affect the distance between countries in terms of institutions. Thus, it is quite plausible that our moderators have also an impact, albeit a small one, on the level of current ID between countries.[5]

Therefore, to deal with this potential bias, we instrument ID by using the length of the period from independence to the present (2020). The identifying assumption is that if this time interval (*independence*) is relatively short then ID between two countries will be smaller, as the colonial heritage will still persist more than in cases where independence was acquired earlier. In turn, our instrument is not correlated with the moderators, as the duration of independence could not affect in any plausible way the duration of colonial ruling or whether a country joins

[3] In terms of variation, about 50 countries have acquired membership of GATT (or WTO, post 1995) of which 20 are also represented in the tire industry, most notably the accessions of countries like Mexico (1986) or China (2001) with multiple domestic tire producers.

[4] ERJ taxonomy included 9 tire types (passenger, light truck, heavy truck/bus, agricultural, motorcycle, all terrain, industrial, aircraft, racing) and most producers tend to specialize in about 3 types (53 percent).

[5] This fact is also supported by the statistically significant correlations between them and the three institutional measures (e.g., colonial: 0.03; −0.06; 0.10; EIA: 0.02; 0.03; 0.06; GATT/WTO: 0.08; 0.13; 0.14).

Table 2
Partner selection and the moderating effects of colonial and economic ties on institutional distance. IV Probit - second stage-.

Variables/Models	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Firm-level controls										
Firm size differential	0.051+	0.053+	0.206***	−0.032	0.039	0.357***	−0.085	0.117***	0.247***	0.253***
	[0.027]	[0.032]	[0.051]	[0.046]	[0.034]	[0.102]	[0.059]	[0.036]	[0.060]	[0.065]
Firm age differential	−0.052	0.002	0.073+	0.079+	−0.008	0.086	0.065	0.047	0.057	−0.054
	[0.035]	[0.041]	[0.044]	[0.043]	[0.042]	[0.053]	[0.043]	[0.043]	[0.044]	[0.050]
Firm knowledge differential	0.081**	0.151***	−0.244**	0.325***	0.208***	−0.495**	0.589***	−0.072	−0.015	−0.204**
	[0.035]	[0.046]	[0.102]	[0.089]	[0.064]	[0.198]	[0.166]	[0.067]	[0.042]	[0.093]
Firm portfolio differential	−0.171***	−0.215***	−0.627***	−0.158**	−0.216***	−0.985***	−0.073	−0.286***	−0.048	−0.213***
	[0.060]	[0.067]	[0.134]	[0.073]	[0.068]	[0.265]	[0.089]	[0.068]	[0.097]	[0.070]
Firm unionization differential	−0.029	−0.192**	0.053	−0.398***	−0.212**	0.306+	−0.536***	−0.141+	0.033	−0.121
	[0.071]	[0.082]	[0.093]	[0.121]	[0.083]	[0.166]	[0.154]	[0.083]	[0.098]	[0.085]
Firm ownership differential	0.288	0.597+	1.890***	0.557+	0.766**	3.788***	0.903***	−0.556	0.44	−2.350***
	[0.290]	[0.308]	[0.586]	[0.292]	[0.337]	[1.289]	[0.339]	[0.475]	[0.333]	[0.889]
Minority	2.740***	2.765***	1.877***	2.715***	2.839***	0.485	2.958***	1.858***	2.109***	3.069***
	[0.225]	[0.247]	[0.686]	[0.323]	[0.275]	[1.499]	[0.501]	[0.484]	[0.785]	[0.664]
Majority	2.791***	3.084***	3.939***	2.930***	3.385***	5.001***	3.561***	2.143***	3.147***	2.968***
	[0.201]	[0.262]	[0.704]	[0.295]	[0.361]	[1.408]	[0.514]	[0.383]	[0.674]	[0.555]
JV	0.867***	1.108***	1.616***	1.046***	1.244***	1.877+	1.383***	0.797***	−0.404	0.931+
	[0.166]	[0.187]	[0.535]	[0.240]	[0.218]	[1.043]	[0.387]	[0.293]	[0.708]	[0.485]
Previous alliance experience	0.097***	0.141***	−0.083	0.036	0.160***	−0.324**	0.007	0.114***	0.014	0.051**
	[0.012]	[0.017]	[0.063]	[0.024]	[0.024]	[0.154]	[0.032]	[0.015]	[0.033]	[0.023]
Prior interactions	3.180***	3.002***	1.415**	3.368***	2.902***	0.513	3.722***	3.607***	4.375***	3.042***
	[0.092]	[0.108]	[0.605]	[0.187]	[0.124]	[1.107]	[0.330]	[0.299]	[0.581]	[0.329]
Country-level controls										
Market size differential	0.068**	0.072**	0.292***	0.045	0.068**	0.329***	0.004	−0.017	−0.117	0.992***
	[0.031]	[0.033]	[0.069]	[0.034]	[0.033]	[0.093]	[0.040]	[0.051]	[0.078]	[0.283]
Market growth differential	2.432**	0.257	3.352***	3.950***	−0.64	4.071***	4.400***	−1.482	−0.398	−14.898***
	[1.061]	[1.296]	[1.178]	[1.153]	[1.430]	[1.380]	[1.213]	[1.736]	[1.457]	[5.437]
Geographic contiguity	−0.271	−0.117	−1.702***	0.064	−0.009	−3.132***	0.259	−0.581**	2.668***	−1.361***
	[0.201]	[0.223]	[0.596]	[0.210]	[0.236]	[1.185]	[0.227]	[0.277]	[0.847]	[0.479]
Geographic distance	−0.227***	−0.095	−0.505***	0.095	−0.050	−0.495***	0.270**	−0.006	0.344**	−0.343***
	[0.051]	[0.067]	[0.150]	[0.082]	[0.081]	[0.152]	[0.134]	[0.085]	[0.150]	[0.110]
Schooling differential	0.012	0.008	0.500***	0.527***	0.007	1.039***	1.060***	0.044+	−0.263***	−0.307***
	[0.019]	[0.019]	[0.163]	[0.156]	[0.019]	[0.368]	[0.319]	[0.026]	[0.087]	[0.112]
Resource differential	0.007	0.017**	−0.011	−0.044+	0.013	−0.111**	−0.086**	0.011	0.048***	0.118***
	[0.006]	[0.007]	[0.016]	[0.022]	[0.008]	[0.050]	[0.034]	[0.008]	[0.010]	[0.031]
COL	0.113***	0.068**	0.104***	0.043	0.046	−0.587**	0.310***	0.024	−0.001	0.083**
	[0.023]	[0.032]	[0.028]	[0.033]	[0.037]	[0.245]	[0.060]	[0.045]	[0.051]	[0.036]
CD	−0.229***	−0.773***			−1.211***			−8.401***		
	[0.037]	[0.215]			[0.395]			[3.392]		
ND	−0.104***		−6.226***			−13.633***			−45.110***	
	[0.038]		[1.997]			[4.834]			[13.749]	
RD	−0.145***			−2.394***			−4.784***			−28.055***
	[0.050]			[0.703]			[1.433]			[8.655]
Main effects										
COL * CD		0.056+								
		[0.032]								
COL * ND			1.165***							
			[0.356]							
COL * RD				0.270***						
				[0.092]						
EIA					−0.549	1.615	−0.130			
					[0.478]	[1.178]	[0.429]			
EIA * CD					1.746***					
					[0.645]					
EIA * ND						12.299***				
						[4.698]				
EIA * RD							4.069***			
							[1.347]			
GATT/WTO								−0.823	−4.188***	0.261
								[0.503]	[1.222]	[0.193]
GATT/WTO * CD								4.740**		
								[1.866]		
GATT/WTO * ND									23.098***	
									[7.035]	
GATT/WTO * RD										14.484***
										[4.434]
Constant	−1.416+	−4.418***	1.619	−6.753***	−5.750***	1.699	−11.970***	0.912	1.024	−0.389
	[0.748]	[1.043]	[1.690]	[1.419]	[1.605]	[1.786]	[3.015]	[1.844]	[1.381]	[1.149]
N	204,312	204,312	204,312	204,312	204,312	204,312	204,312	204,312	204,312	204,312
Log Likelihood	−736.41	1722.14	459.08	1164.74	1520.56	191.73	658.31	901.54	365.60	461.35
Wald Chi-Square	–	7.39***	10.58***	10.00***	6.46**	11.31***	10.74***	7.19***	12.60***	11.36***

Notes: The dependent variable equals 1 if the potential partner in the dyad is selected for an exploitative technological alliance, and 0 otherwise; All models include time dummies and an intercept, not reported given space constraints; +, ** and *** indicate variables that are significant at the 10%, 5% and respectively 1%. These results are estimated using IVprobit (Stata 16.1) command and using all exogenous variables as potential instruments.

a bilateral EIA or the GATT/WTO. The results of the Wald Chi-square tests carried out confirm that exogeneity of ID vis-à-vis the moderators can be rejected at 5 percent or better, which validate the use of IV techniques, namely an IV probit due to the binary nature of our DV.

The first stage results of the IV probit estimation are presented below in Table A.4 (i.e., the instrumentation equations – first stage-, Appendix) while our hypothesized moderation effects (instrumented) are presented in the main body of the paper (Table 2). The first stage results overwhelmingly indicate a positive and significant effect of independence duration on institutional distance, as expected.

4. Results

4.1. Main findings

Table 1 presents the descriptive statistics while the variables' correlation matrix is shown in Table A2 (Appendix). Our main results (i.e., hypothesis testing) using an IV probit estimator (Models 2–10) where institutional distances are instrumented using the duration of independence are presented in Table 2 (only Model 1 is a simple probit with control variables only). We cluster all standard errors on the dyad. In terms of controls (Model 1) we get confirmation that the degree of partner interdependence (i.e., firm differentials in terms of product portfolios and size), existing formal ties (i.e., JVs, minority or majority holdings, with the omitted category being "no relationship"), as well as previous experience in terms of alliances, or prior interactions between firms are all significant predictors for selection of partners. At the country-level, larger differences in terms of growth rates or resources (i.e., natural rubber) as well as long-lasting colonial links favour selection of partners. Importantly, cognitive, normative, and regulatory distances between prospective partners appear to hinder (both individually and jointly) the appeal of forming a technological alliance for exploitation; the coefficients of all these variables are negative and statistically significant. In terms of magnitudes, one standard deviation increase in cognitive distance between two potential partners will reduce the log odds of selection for a technological alliance by 0.23, compared to 0.10 (normative), and respectively 0.15 (regulatory distance).

In all remaining Models (2 through 10) we instrument institutional distances (across the three pillars-cognitive, normative, and regulatory) using the duration of independence to avoid potential overlap with our moderators (colonial duration and strength of economic ties between home countries of potential partners in a dyad). The direct effect of colonial duration is positive and significant suggesting that, ceteris paribus, firms from countries which has colonial links in the past are more likely to form alliances. The coefficients of instrumented distances are larger in magnitudes and remain statistically significant, just as the interactions with colonial duration (Models 2, 3 and 4). Overall, these results suggest that the moderation via colonial duration occurs through all institutional channels postulated, namely cultural-cognitive elements, managerial norms and practices, as well as laws and regulations.

Economic integration via bilateral EIAs (Models 5, 6 and 7) or participation in the GATT/WTO (Models 8, 9, and 10) appears not to have a direct effect on the selection of alliance partners. Nevertheless, the interactions with the proposed cognitive-normative-regulatory distances are all positive and statistically significant supporting our theoretical conjectures.

4.2. Economic significance

To get an overview of these effects, we have also examined the marginal effects at the mean for the three institutional distances considered. The largest effect was achieved by cognitive distance (−0.0003108) followed by regulatory (−0.0002906) and normative one (−0.0001998). Nevertheless, the overall magnitude of these marginal effects is rather small, given the large size of the dataset (more than 200,000) combined with the rare nature of the events (exploration and exploitation alliances occur in only 0.15 percent of cases in our global population of dyads for tire producers) and the parsimonious nature of the econometric models used. However, these point estimates are well within the estimate range of previous studies using similar (i.e., large dyadic) settings (see Vasudeva et al., 2013 for an example[6]).

We also perform a similar analysis for our interactions and here we also plotted these interactions holding all other variables constant (Ai and Norton, 2003; Hoetker, 2007). All these are graphed in Figs. 2, 3 and 4 (subscripts **a** through **c**). Again, the overall magnitudes suggest small effects (in this big and rare-event type of data, and parsimonious econometric model) but the analysis confirms the role of the proposed moderators in mitigating the effects of institutional distance.

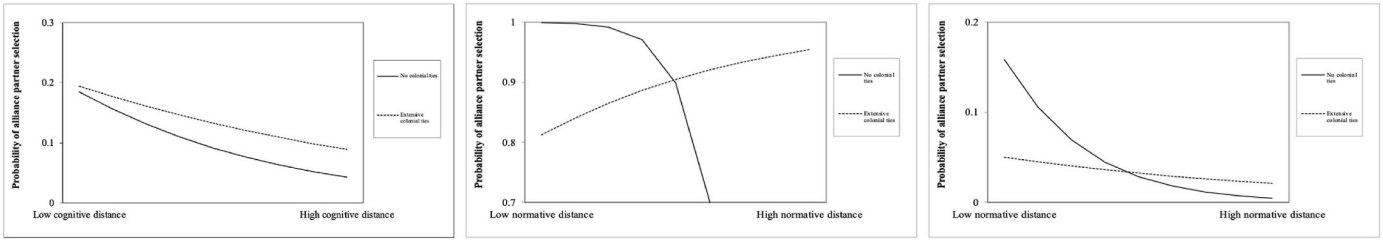
4.3. Robustness checks

To further check the validity of our findings, we performed several additional analyses. Most of these results are not reported in the paper due to the space constraints but are available upon request. First, in relation to potential omitted variables, we have also checked the robustness of our findings by including several other controls against the proposed institutional distance measures. Thus, one can argue that the quality of infrastructure in a country can appeal to foreign tire producers seeking domestic alliance partners for co-production purposes. To capture the differentials in terms of *quality of infrastructure* we employ the *connectedness distance* in a dyad developed by Berry et al. (2010). This index captures nicely the relative connectivity between two countries (which can be distant geographically) and the differentials in terms of IT infrastructure (which we feel should be more important in the case of an alliance, then the physical one (roads, train tracks, etc.) which is anyways highly correlated with GDP differentials for which we control. When we include all our distance measures and this connectedness proxy, this variable has a negative sign as expected but it is not significant.

Second, from the same source (Berry et al., 2010) we include other country distance measures that capture distinct aspects of cross-country differences (e.g., *knowledge* distance, *political* distance, and *economic* distance). Although the sample size suffers a significant reduction (to 82, 281 dyads), we find that our cognitive and normative measures of institutions retain high statistical significance upon introduction of these additional variables. Throughout these specifications, our regulatory distance becomes insignificant while knowledge and economic distance are the only ones with mild statistical significance (at 10 percent).

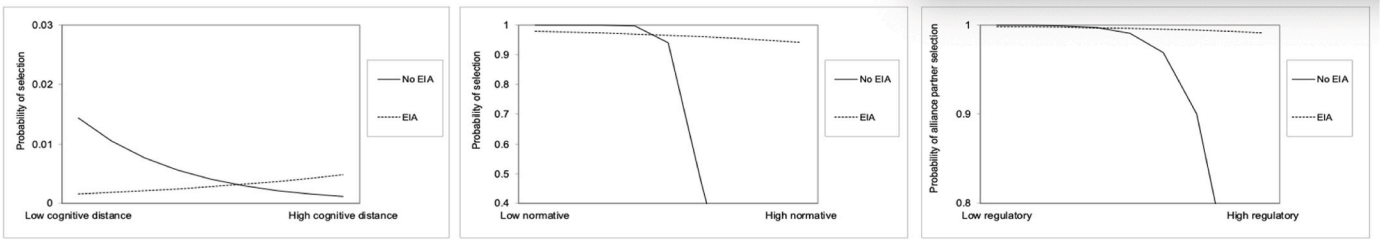
Third, one may suspect that these results are driven by the large dimension of the dataset or the predominance of zeros (i.e., unrealized alliances) in the data. To ensure that our results are not driven by sample size we have re-run the analysis employing a random 5 percent of the zeros in our dataset (i.e., dyads where no partner was selected for exploitation alliance) alongside all the ones. Moreover, the realization of our DV is extremely low (only 0.15 percent of all dyads form an exploitation alliance). To further check that our results are not driven by this artefact of data we employ a rare-event logit model that relies on maximum likelihood estimation to generate coefficients with lower

[6] Vasudeva et al. (2013) study uses a dyadic dataset of about 350,000 observations and their marginal effects range from 0.0002 to 0.005 (see Figs. 1 and 2 examining the effects of partners' degree of centrality and technological distance).



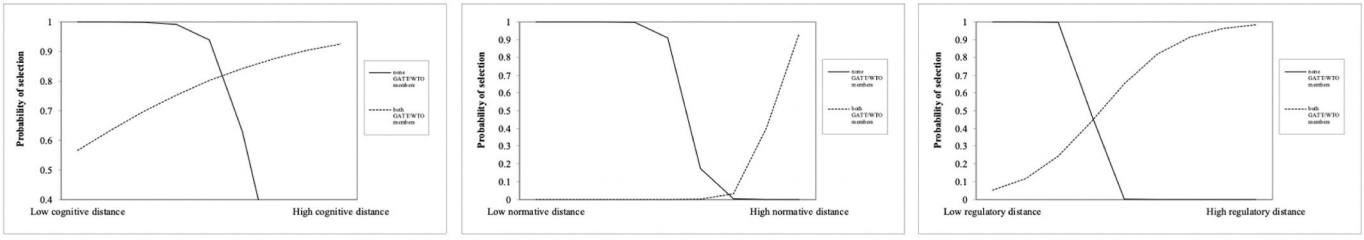
Note: We consider the following thresholds as low and high: -2 and 2 for cognitive distance, -1 and 4 for normative distance, respectively -2 and 2 for regulatory one.

Fig. 2. The moderating effects of colonial duration
Note: We consider the following thresholds as low and high: −2 and 2 for cognitive distance, −1 and 4 for normative distance, respectively −2 and 2 for regulatory one.



Note: We consider the following thresholds as low and high: -2 and 2 for cognitive distance, -1 and 4 for normative distance, respectively -2 and 2 for regulatory one.

Fig. 3. The moderating effects of economic integration agreements (EIAs)
Note: We consider the following thresholds as low and high: −2 and 2 for cognitive distance, −1 and 4 for normative distance, respectively −2 and 2 for regulatory one.



Note: We consider the following thresholds as low and high: -2 and 2 for cognitive distance, -1 and 4 for normative distance, respectively -2 and 2 for regulatory one.

Fig. 4. The moderating effects of WTO/GATT membership
Note: We consider the following thresholds as low and high: −2 and 2 for cognitive distance, −1 and 4 for normative distance, respectively −2 and 2 for regulatory one.

mean square errors than the standard logit model (King and Zeng, 2001). In both cases, the results are similar, confirming our main findings.

Finally, while our theoretical predictions support a linear effect of institutional distance on partnering decisions for exploitation technological alliances, we are also keen on investigating whether this relationship has any non-linearities, which may present opportunities for future research in this area. As such, we have also included squared terms of all the three institutional distances considered in separate regressions (to avoid multicollinearity).[7] The squared terms of both cognitive and regulatory distances are negative and significant, while for normative is positive and significant suggesting a slight inversion consistent with a U-shape relationship between partnering appeal and normative differences between firms in an alliance. Further insights into these ex-post results are provided in the discussion and conclusions section of the paper.

5. Discussion and conclusions

Institutional differences remain a salient decision criterion for international activities of organizations (Gaur, Delios & Singh, 2007; Brouthers and Brouthers, 2000). While the negative *direct effects* of institutional distance (ID) have received significant attention in the literature, we know much less of the ways in which focal firms can potentially mitigate these costs and risks when seeking alliance partners. In this study we shed light on the role played by formal and informal ties between countries in reducing the negative effects of ID in the case of a specific activity –i.e., selection of partners for exploitative technological alliances – that is often used to secure competitive advantage and exploit technological assets (Yamakawa et al., 2011).

To examine these issues, we combine two theoretical lenses, which have not been hitherto used for this purpose. The first lens focuses on the complexity and diversity of the institutional environment, following Scott's (2001) distinction of cognitive, normative, and regulatory pillars, which was encapsulated in the concept of ID (Berry et al., 2010). The second lens employed looks at the historical relationships between countries as indicative of contemporaneous firm interactions in an

[7] These results are available upon request from the authors.

international context (Makino and Tsang, 2010; Klüppel et al., 2017), leading us to examine the effects of informal and formal ties between nations on the collaborative activities of by organizations from these countries, specifically the issue of partner selection for alliances.

Subsequently, we contribute in several ways. First, we examine theoretically and empirically potential contingencies for overcoming the detrimental effects of institutional distance. Our current knowledge of how firms can hedge or mitigate the costs and risks of engaging with institutionally distant environments is limited, and moreover confined to firm-specific mechanisms (Delios and Beamish, 2001; Henisz, 2003; Gaur and Lu, 2007; Chao & Kumar, 2010). Complementing these insights, we demonstrate that formal (economic) and informal (colonial) ties between countries have the potential to reduce the negative effects of institutional distance in the selection of partners for international exploitative alliances. In this way, we theorize and analyse empirically in a large setting two alternative explanations on how organizations can successfully mitigate the effects of institutional distance when dealing with international partners.

Second, our findings showcase the role of "omitted insights" such as countries' colonial past or current economic integration strategies in affecting organizations conducting international business. In this way we answer recent calls to bring history back in the field (Jones and Khanna, 2006; Klüppel et al., 2017; Wadhwani et al., 2018) and to pay more attention to the role of economic integration on organizational behaviour and strategies (Alhorr et al., 2008; Frantianni & Oh, 2009). Our results suggest that alliances between distant partners might still be attractive if their host countries are linked by formal or informal ties, promoting the idea that both historical antecedents and current economic integration efforts of countries are conducive of more inter-firm technological cooperation via exploitative alliances.

Finally, we advance the research on strategic alliances by providing insights from international relations on how the macro-contextual environment of organizations matters for their strategies and choices in a cross-border context. Thus, partner selection for exploitation is negatively related to all types of institutional distance but having an extensive colonial past or strong economic ties between countries will mitigate some of the institutional distance-related costs, particularly through cognitive and normative channels. Also, the type of economic agreements (EIAs or WTO) matters, and our results suggest that bilateral treaties to be more effective in mitigating the negative effects of institutional distance across all domains. Broadly, we can say that institutional differences express what sets countries (and the firms embedded in their environments) apart, whereas colonial and economic ties articulate what brings them closer together. Overall, these contrasting forces provide a balanced and realistic view of the selection process.

Theoretically, our conjectures support the confluence of institutional theory (Scott, 2001) with insights from political science and international relations, particularly on the role of dyadic historical and economic ties in firms' strategies and behaviours. Specifically, prior work on such country ties has focused on their direct effect, and mostly in narrow settings that include only a few countries (Frynas et al., 2006; Zhang and He, 2013; Liou & Nicholson, 2017). We move this discussion forward and show that a firm's decision to select a partner are contingent not only on the level of institutional differences it exhibits but also, on the ties between the home countries of firms. The mechanisms through which this moderation occurs are intricately related to the formal (i.e., codified and enforceable prescriptions, institutional spillovers) and informal (i.e., deep mutual tacit knowledge, common legal traditions, nationalism) nature of these ties.

5.1. Practical implications

These findings will hopefully draw the attention of managers and policy makers to the joint importance of institutional background as well as the macro-context of prospective partners for inter-firm alliances and technological transfers. Thus, managers should be mindful of engaging in alliances with very dissimilar cognitive, normative, and regulatory partners, as these differences will be difficult to overcome and will require additional resources to be committed (Gulati and Singh, 1998; Chan and Makino, 2007; Delerue and Simon, 2009). Our results suggest that an effective way to mitigate these negative effects is to form alliances for technological exploitation with partners where there are either formal or informal country links established. Thus, the existence of a lengthy colonial relationship in the past or greater economic integration via multilateral (WTO) or bilateral (EIAs) agreements have the potential to reduce uncertainty and risks stemming from institutional distance across cognitive, normative, and regulatory elements. These are already reflected in some of the preferences exhibited by MNEs from major former colonial powers (like the United Kingdom, Netherlands, or Portugal) which indicate a clear preference for alliances with firms from their former colonies with whom they are more familiar. Similarly, the effects of trade blocks like NAFTA or the EU are illustrative of the types of alliances formed by American and European firms.

On the policy side, our results suggest that deficits in terms of regulatory provisions such as IPR, education or technology investments (Krammer, 2009; Khoury and Peng, 2011) may stifle foreign firms from seeking to form alliances with domestic firms in a country. Our results confirm the effects of history and geopolitics on inter-firm international alliances as both powerful and enduring, suggesting that national policies that support economic integration (e.g., joining of the GATT/WTO, signing of bilateral EIAs) can alter firms' perception of risks regarding distant partners and increasing their appeal as technological partners. Subsequently, governments in these countries seeking to make domestic firms more attractive to technological partnerships can actively pursue engagement in such bilateral and multilateral agreements to confer comparative advantage to their domestic organizations in terms of attracting foreign partners.

5.2. Limitations and opportunities for future research

This study is subject to several limitations that provide avenues for further research. First, we have focused exclusively on a very specific type of inter-firm interaction (i.e., horizontal technological alliances for exploitation) because we wanted to have clearer theoretical argumentation for selection rationales (Phelps, 2010) and to better emphasize the role of institutional differences as our baseline story. The international orientation of alliance activities between tire producers (Acha & Brusoni, 2010), and the clear effects of ID for exploitation agreements have prompted us to focus on these types of agreements for our study. However, future studies may want to venture outside this context and probe, both theoretically and empirically, the effects of formal and informal ties on firms in different settings (e.g., high tech industries, vertical versus horizontal alliances, technological versus non-technological alliances). Particularly those that will be able to draw on large samples with good representation of countries and industries would be able to triangulate and test competing predictions stemming from a large, yet eclectic, alliance literature.

Second, our theoretical predictions do not rely on any idiosyncratic feature of the tire industry, and therefore are generalizable to other empirical settings (e.g., high-tech, fast-growing industries). Hence, future studies may want to examine empirically whether the negative effects of institutional differences, as well as other types of formal and informal ties between countries (e.g., migration; conflicts, etc.), have direct or indirect effects on dyadic interactions at the firm level in other international contexts.

Thirdly, we wanted to draw attention upon possible "omitted insights" stemming from historical accounts (Makino and Tsang, 2010), which can provide additional explanations for the selection of alliance partners in an international context. To this end, we focused on the duration of colonial interactions between countries as a historical bridge between organizations and individuals in these countries, a channel which has allowed mutual exposure and implicitly, greater knowledge

and familiarity with each other's cognitive and normative characteristics. However, colonial histories often represent messy, ugly experiences that can have both positive and negative connotations for the parties involved. This could result in national sentiments that will affect also economic interactions (M. Y. Li et al., 2019). A promising line of inquiry which can be exploited by future work is to examine whether the type (e.g., good or bad) and extent (e.g., length, degree of integration) of these episodes or overall relationships bear any effects on contemporaneous international interactions (at various levels) between former colonizer-colony pairs.

Fourthly, due to the discontinuation of the alliance data in the Global Tyre Report from ERJ in 2003, we are unable to extend this analysis to the present date. While our current dataset has a sizeable longitudinal dimension (1985–2003) covering some of the major junctions in terms of globalization that are critical to our theorization, and moreover it is arguable that a low-tech industry like tires is more likely to remain stable over time, we still must acknowledge this important caveat as recent developments in terms of technological change, environmental legislation or political movements may have further influenced these companies and their alliance strategies. As such, extending the alliance data to the present from alternative sources could provide fruitful avenues for examining the impact of various international developments and exogenous shocks like the financial crisis or the recent COVID-19 pandemic (Krammer, 2022).

Finally, our additional analyses suggest some interesting avenues for future research. In particular, the non-linear effects of institutional distance appear to be present but quite heterogenous, pending on which institutional dimension one chooses to focus on. As such, future studies investigating the role of institutional distance should examine both theoretically (i.e., develop rationales for why the relationship between ID and various firm behaviours/strategies will be quadratic) and then test them (ideally in a large, international setting). This could shed further light on the complexities of institutional effects at work, as well as boundary conditions for the effects of institutional differences on cross-border activities.

5.3. Concluding remarks

Institutional differences present prominent obstacles for organizations seeking to engage successfully in business across borders. While the negative effects of institutional distance have been well documented in prior studies, we lack sufficient knowledge on potential mitigating factors. This study provides an answer to this question by examining the role of formal and informal dyadic ties between countries. Using exploitative technological alliances with foreign partners in the global tire industry as the empirical testing ground for these conjectures, it shows that both informal (colonial) and formal (economic agreements) ties between countries reduce the impact of institutional distance on selection of partners for alliances. These results provide evidence for the role of historical and current connections between countries as means to reduce transaction costs in international interactions between organizations.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.technovation.2024.103155.

Data availability

The authors do not have permission to share data.

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