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Paolo Barbieri

Department of Management
University of Bologna
Via Capo di Lucca, 34 - 40126 Bologna, Italy
Phone: +39 051 2090211
E-mail: p.barbieri@unibo.it

Antony Paulraj

Department of Entrepreneurship, Marketing, and Management Systems
Nottingham University Business School China
University of Nottingham Ningbo
Phone: +86 (0) 574 8818 0000 - 8631
E-mail: Antony.Paulraj@nottingham.edu.cn

Reham Eltantawy

Department of Marketing and Logistics
Coggin College of Business
University of North Florida
1 UNF Drive, Jacksonville, FL 32224
Phone: +1 904 620 1505
E-mail: reham.eltantawy@unf.edu

Giorgio Prodi

Department of Economics and Management
University of Ferrara
Via Voltapaletto 11 - 44121 Ferrara, Italy
Phone: +39 0532 455030
E-mail: giorgio.prodi@unife.it

Understanding the governance of high-performing international buyer-supplier relationships in China using complexity-based contingencies

1. INTRODUCTION

Given that buyer-supplier relationships are increasingly becoming international in nature, designing appropriate governance forms for ensuring high-performing cross-national relationships is of paramount importance to gain competitive advantage. Most of the studies involving inter-firm exchanges in non-Western economies predominantly consider the case of Western companies in China (e.g., Li et al., 2010; Salmi, 2006; Zhou and Xu, 2012). Typically, past studies that investigate governance of the Western buyer-Chinese supplier (WB-CS) exchange have remarked the importance of relational governance as a prevalent practice, in light of both Institutional weakness of the Chinese legal system (that would reduce the effectiveness of formal contracts) and China's heritage of personal-based approach to business conduct (Li et al., 2008; Zhou and Xu, 2012; Li et al., 2010). However, whether this conclusion applies to every sourcing activity in China remains unclear. On the one hand, Western firms generally adopt formal contracts (i.e., transactional governance mechanism) in managing cross-border relationships (Burkert et al., 2012; Cavusgil et al., 2004) as they may be reluctant to give up the protection offered by these contracts. On the other hand, the development of strong ties in itself may be extremely difficult and time consuming in light of the different cultural background of the Chinese and Western firms (Li et al., 2010; Millington et al., 2005). These contrasting views make it difficult to understand which form(s) of governance will be effective in WB-CS relationships. Indeed, the choice of governance mechanisms could be contingent on specific contextual factors under which the relationship is operated, since it is likely that the main objective of these governance forms would be to overcome the challenges posed by such factors.

In effect, various scholars (Li et al., 2008; Lihong and Goffin, 2001; Liu et al., 2009) recommend to account for context-specific factors when examining the governance forms adopted in WB-CS relationships. Among other contextual factors, complexity could be a key contingency that

could have a significant effect on governance forms. Specifically, Nassimbeni and Sartor (2007) recognize that complexity dimensions (particularly, product and supply context complexity) influence the choice between “traditional” and “collaborative” sourcing forms by Western firms in China. Also, though not related to the specific context of Chinese suppliers, scholars have considered complexity as a key contingency that could explicate the adoption of appropriate governance mechanisms (e.g., Handley and Benton, 2013; Roehrich and Lewis, 2014).

Against this backdrop, the aim of our study is to understand the governance of high-performing WB-CS relationships through context-specific factors. Towards this end, we propose sourcing structural complexity and sourcing process complexity as two dimensions of complexity to help explain the adoption of different governance forms. Sourcing structural complexity refers to the complexity inherent in how the international buyer-supplier relationship is configured, and is reflected by the number of entities involved in the relationship, geographical distance between them, as well as the geographical dispersion of such entities (Anderson, 1999; Larsen et al., 2013; Schmoltzi and Wallenburg, 2012). Sourcing process complexity refers to the task complexities inherent in the different phases that make up the sourcing process, namely: profiling the purchasing category, supplier selection, negotiation, and compliance (Monczka et al., 2011; Tate and Ellram, 2009). We characterize high-performing relationship as one that shows good supplier operational performance (Giannakis et al., 2012), negligible opportunistic behaviour (Wang et al., 2016; Zhou and Xu, 2012), and a general overall satisfaction with the relationship (Li et al., 2010). Specifically, we use four cases of WB-CS relationships to address the following research question:

RQ: How do different levels of structural and process sourcing complexity help explain the governance of high-performing WB-CS relationships?

While studying the WB-CS context, scholars have also tried to examine the right choice and combinations of transactional and relational governance mechanisms in such relationships. However, these results have been mixed: particularly, while Luo (2002) and Zhou and Xu (2012) found that a simultaneous adoption of formal contracts and relational governance enhance effectiveness in

curtailing supplier's opportunism, Li et al. (2010) did not find support for the benefits of combined contracts and relational governance in improving exchange performance. Accordingly, the mixed results and ensuing confusion around the combination of different governance mechanisms could potentially be explained by taking a contingent approach based on complexity (e.g., Roehrich and Lewis, 2014). With this belief in mind, we also try to shed light on this conundrum as part of our main research question.

Our study makes three major contributions to the literature on WB-CS relationships. First, it shows that the extent of the various governance mechanisms (i.e., centralized control, formalized contracts, structural and process relational governance) is distinctly different under different levels of structural and process sourcing complexity – which is influenced also by the specific peculiarities of the Chinese context. Second, it also clearly illustrates when (i.e., under which conditions) and how to combine these governance mechanisms in managing high-performing WB-CS relationships. Finally, though not the primary aspiration, our study also contributes to the limited stream of literature linking complexity and relationship governance by empirically showcasing that complexity significantly influences the choice of governance mechanisms.

2. THEORETICAL BACKGROUND

2.1 Governance of Buyer-Supplier Relationships

Firms need to employ the right form of governance mechanisms to ensure the success of buyer-supplier relationships (Hoetker and Mellewigt, 2009; Nickerson and Zenger, 2004). When it comes to the different types of governance mechanisms, extant research segregates them into two broad forms – transactional and relational (Barbieri et al., 2021; Blome et al., 2013; Liu et al., 2009; Paulraj and Blome, 2017; Poppo and Zenger, 2002; Roehrich et al., 2020). Governance mechanisms, whether transactional or relational, need to be further classified as structural and process dimensions (Luo, 2002; Zaheer and Venkatraman, 1995). Structural mechanisms are ex-ante and provide the structure, conditions and/or frameworks within which an exchange will take place; process

mechanisms are ex-post and represent the actions and/or processes that will be used to ensure relationship success.

2.1.1. Transactional Governance Mechanisms

Transactional governance can be defined as the usage of market-based and formal mechanisms such as vertical integration and contracts to influence the behavior and output of the partner. One of the dominant transactional governance mechanisms proposed by transaction cost economics scholars is *contracts*. Also termed as “legal bonds”, contracts include detailed and binding agreements that specify the roles and obligations of exchange partners (Cannon et al., 2000). Contracts could also explicitly stipulate plausible actions that could safeguard the partners against losses in case any unforeseeable incidents occur (Williamson, 1985). Given that a contract provides the overall framework within which an exchange takes place, it is a structural transactional mechanism (Luo, 2002; Zhou and Xu, 2012). On the other hand, *centralized control* refers to the extent to which decisions and behavioral are controlled by a single partner (Zhou and Xu, 2012). It influences decisions and behavior of the exchange partner through fiat (e.g., Bello and Gilliland, 1997). Conceptually, controls can reduce information asymmetry between the partners by enhancing the ability of the buyer to detect operational as well as behavioral issues in the relationship. Among others, it includes delivery and quality control, annual audits, onsite visits, direct control over second-tier suppliers. In general, centralized control enables controlling as well as monitoring the activities of the exchange partner so as to prescribe appropriate behavior and proscribe inappropriate behavior (Gençtürk and Aulakh, 2007; Lusch and Brown, 1996). Accordingly, given that centralized control represents actions that are taken to ensure relationship success, it is a process transactional mechanism (Williamson, 1985; Zhou and Xu, 2012).

2.1.2. Relational Governance Mechanisms

Relational governance, often defined as “informal self-reinforcing governance” (Blome et al., 2013; Dyer and Singh, 1998), thrives on open communication, trust, solidarity, and joint cooperation (Heide, 1994). Zaheer and Venkatraman (1995) suggest *quasi-integration* as a structural dimension

of relational governance. Increasing levels of quasi-integration implies a clear departure from transactional “arms-length” relationships. Rather it implies that the buyer firm works with a smaller number of suppliers, which allows the firm to allocate increased proportion of demand to this smaller supply base and extend the relationship over a longer period of time. Quasi-integration could also be reflected in the extent of relationship-specific investments¹. Even though such investments could create a locked-in situation, they promote trustworthy behavior that ensures long-term relationship continuity (Heide, 1994). In effect, given that quasi-integration defines the boundaries within the relationship operates, it is considered as a structural dimension of relational governance (Zaheer and Venkatraman, 1995). Extant research proposes both *information sharing* and *joint action and joint problem solving* as process dimensions of relational governance (Paulraj et al., 2014; Zaheer and Venkatraman, 1995). Through open communication, partners could not only share ideas or initiatives, but also resolve conflicts or problems (Claro et al., 2003; Macneil, 1980). Frequent sharing of information on strategic as well as operational aspects could not only increase confidence and trust, but also reduce relational conflicts (Paulraj et al., 2008). Additionally, joint actions reflect a collaborative relationship that “involves the parties carrying out the focal activities in a cooperative and coordinated way” (Heide and John, 1990: 25). Through joint actions the partner firms could integrate relational resources and capabilities, make joint decisions, develop each other’s processes, and adapt to each other’s needs (Paulraj et al., 2014). In essence, since both these mechanisms represent actions that the exchange partners can take to ensure the success of the relationship, they are considered as process dimensions of relational governance (Zaheer and Venkatraman, 1995).

2.2.Managing the Western Buyer-Chinese supplier relationship

In managing cross-border relationships, firms have to account for the economic, socio-cultural and institutional differences that may impact the effectiveness of the governance forms to be adopted (Burkert et al. 2012). In the case of China, scholars have particularly stressed the relevance of

¹ While some researchers consider such investments as transactional (e.g., Liu et al., 2009), we consider them as a manifestation of quasi-integration (i.e., structural relational governance mechanism) as such investments signal motivations for continuing the relationship over a longer period of time (c.f., Heide, 1994, Jap and Anderson, 2003).

“guanxi”, interpersonal relationships and social interactions (e.g., exchange of favours), that are deeply rooted in the Chinese culture and help in the context of weak institutions (Lovett et al., 1999; Zhou and Xu, 2012). Inherent to this approach is a preference for long-term orientation and availability to mutual adjustments in the relationship (Giannakis et al., 2012; Salmi, 2006). It has been noted that many of these aspects resemble those of relational governance (Lovett et al., 1999; Xin and Pearce, 1996). Whether guanxi still remains salient in a context that is more and more market-oriented is still an ongoing debate (Nolan and Rowley, 2020; Wilson and Brennen, 2010). Moreover, the actual interest, or capability, of Western firms to conform to these norms when dealing with Chinese partners should not be taken for granted as it requires a significant investment of time and resources as well as appropriate social skills and cultural knowledge (Salmi, 2006). Lihong and Goffin (2001) find neither a long-term orientation nor a strong influence of guanxi in their analysis of supplier management of international joint ventures in China. Li et al. (2008) find that compared to domestic companies, foreign firms have a competitive disadvantage from tie utilization.

On the other hand, the effectiveness of formal contracts for managing the relationship with the Chinese supplier has been questioned. This is due a general perception that (a) contractual enforceability is generally weak in China, and (b) the supplier would not understand the contract terms being as binding as the buyer does and would rather implicitly assume renegotiations as part of the contracting game (Leonhard, 2009; Nassimbeni and Sartor, 2007). Thus, the real effectiveness of these devices in the relationships with Chinese suppliers remains uncertain (Wang et al., 2016; Zhou and Xu, 2012) even though formal contracts are generally considered as a main safeguard mechanism that (1) buyer firms employ when doing business in less familiar environments (Burkert et al., 2012; Cavusgil et al., 2004), and (2) help supplier firms with unilateral transaction-specific investments to successfully mitigate the foreign buyer’s opportunism (Wang et al., 2020). Finally, centralized control seems to be adopted with higher intensity by Western firms when they operate in China (Campbell et al., 2004; Salmi, 2006). Still, in light of the effort it requires, it is doubtful whether it is actually used under all circumstances.

In sum, crafting appropriate governance forms could be quite a hard task while conducting business in China. Various scholars have underlined that to study how firms decide on appropriate governance forms should account for the specific context conditions within which the transactions occur (Li et al., 2008; Lihong and Goffin, 2001; Liu et al., 2009). Such peculiar conditions could motivate (1) the great effort that is usually required to establish strong relational ties with the Chinese supplier, and/or (2) the reliance on a formal agreement despite the difficulties in writing and operating it. Yet, to date literature has offered very little insights on how various contingencies influence the design of the governance mechanisms in the WB-CS exchange.

In studying the various governance mechanisms in the WB-CS relationships, some scholars suggest that the simultaneous adoption of both formal contracts and relational governance mechanisms can prove beneficial in this context (Li et al., 2010; Zhou and Xu, 2012) given that they could mutually remedy for each other's limitations. For example, while contracts may help lay down the foundation for relational norms that could be lacking among partners involved in a cross-border exchange, relational governance could establish and maintain the social obligations that bind parties to the conditions of the contractual agreements (Zhou and Xu, 2012). Alternatively, research also contends that in light of the high contracting costs when dealing with Chinese suppliers and the effort required to establish effective relational governance mechanisms, the simultaneous use of the two modes could barely be economical (Li et al., 2010). The limited empirical research on the topic have also led to mixed results. Li et al. (2010) did not find support for the benefits of combined contracts and relational governance in improving exchange performance. They attribute this finding to (1) the inclination of Chinese suppliers to treat contracts as a signal of distrust and (2) the preference of Western firms to insist on formal agreements to govern the relationship. In contrast, Luo (2002) and Zhou and Xu (2012) found that the effectiveness of formal contracts in curtailing supplier's opportunism is enhanced when they are used in combination with relational governance.

2.3 Complexity and Governance of Buyer-Supplier Relationships

Complexity is a property of a system that is usually defined in terms of the number of its entities, and of the degree of interdependence among them (Schmoltzi and Wallenburg, 2012; Zhou and Wan, 2017). Simon (1962, p. 468) describes a complex system as “one made up of a large number of parts that interact in a nonsimple way”. Managing these interdependencies implies the exchange of a vast amount of varied information among parties that could be difficult as well as costly to process. Therefore, in the presence of increasing complexity, decision making also becomes increasingly uncertain and subject to more errors (Levinthal, 1997). Challenges of this kind can (and do) arise in interfirm control and coordination activities (Robson et al., 2008; Schmoltzi and Wallenburg, 2012), reflecting the relevance of complexity for the design of governance mechanisms. However, as observed by Zhou and Wan (2017), “when the consequences of complexity are studied, the presence of complexity is mostly assumed rather than theorized. We know little about how complex relationships emerge in real organizations” (p. 1569). Along similar lines, literature examining the impact of complexity on governance choices also remains scarce (Handley and Benton, 2013; Schmoltzi and Wallenburg, 2012). More importantly, the empirical results on this phenomenon are also not uniform. On the one hand, Mesquita and Brush (2008) find that the positive effect of contractual completeness on production efficiency (and, to a lesser extent, on negotiation efficiency) is stronger when complexity is higher. Alternatively, Anderson and Dekker (2005) observe that in spite of an increased contractual extensiveness (and consequent cost of contracting) in the cases of increased task complexity, ex post transaction problems still occur whenever task complexity is high. A similar outcome is also observed by Caldwell et al. (2009) and Roehrich and Lewis (2014) in their research on the Procurement of Complex Performance – one of the fields where the relation between complexity and governance has been more extensively examined. Though studies in this domain have been mainly conducted in the servitization (Kreye et al., 2015) and public-private partnerships contexts, their characterization of complexity – i.e., in terms of performance and infrastructural complexity (Lewis and Roehrich, 2009) – is not conceptually limited to these settings alone. Specifically, Roehrich and Lewis (2009; 2014) suggest that while sole extensive contracts continue

to suffer from incompleteness (leading to many post-contractual renegotiations) in the case of high systemic complexity, when combined with relational mechanisms they tend to result in higher flexibility, mutual adaptation, and ultimately, more efficiency in counteracting complexity. Hartmann et al. (2014) illustrate how relational capabilities evolve in the transition towards procurement of complex performance and contribute to effectively master the transition process. However, Roehrich and Lewis (2014) also suggest that complex contracting, if conducted with an aggressive approach, can alternatively result in distrusting behaviour among the parties. In summary, the effectiveness of contracts in managing the challenges raised by complexity is still ambiguous; besides, while complexity is typically acknowledged as a multi-dimensional construct (Handley and Benton, 2013), the impact of its single dimensions on transactional and relational mechanisms (as well as on their combination) has been rarely addressed.

2.4 Key Contingencies of Governance

In line with past studies (Brehmer and Rehme, 2009; Handley and Benton, 2013) we distinguish between two types of complexity – configuration-related and task-related. Sourcing structural complexity captures the configurational aspects of sourcing, whose importance in international relationships has been stressed in literature (e.g., Handley and Benton, 2013; Larsen et al., 2013). Sourcing process complexity captures the task-related aspects of sourcing.

2.4.1 Sourcing Structural Complexity

Sourcing structural complexity is reflected by the number of entities (e.g., a firm's global subsidiaries), geographical distance between them, as well as the geographical dispersion of such entities (Anderson, 1999; Larsen et al., 2013). While geographical distance covers the proximity or spatial separation between the entities involved, geographical dispersion represents the different countries in which the entities are located (Handley and Benton, 2013). This operationalization of sourcing structural complexity is effectively captured in our study using the two forms of internationalization sourcing strategy showcased by Kaufmann and Hedderich (2005): (1) *local sourcing abroad* wherein the supplier supplies only the buying firm's local subsidiary and (2)

integrated global sourcing wherein the supplier supplies to either a number of or all of the buyer's global subsidiaries. In the case of local sourcing abroad structural complexity is low given that it involves only two entities located in the same country. Alternatively, integrated global sourcing reflects a high structural complexity in that it involves multiple units with greater geographical distance spanning multiple countries.

Sourcing structural complexity could have a profound effect on the governance of international relationships due to various reasons. First, increasing number of entities involved has a direct impact on the degree of interdependencies. Accordingly, as the number of entities increases, the coordination and integration of the resulting interdependencies could become challenging (Robson et al., 2008). Bals and Turkulainen (2021) observe that from the supplier's perspective, the integrated global sourcing configuration adopted by the buying company can raise significant difficulties, since the supplier is required to manage the customer interface globally, while simultaneously providing variations at the local level. Increased number of entities could also result in diversified and/or competing interests, hidden agendas, and ultimately opportunistic behavior (Das and Teng, 1998; Schmoltzi and Wallenburg, 2012). Second, geographical distance has been widely acknowledged as a factor that can render sourcing particularly difficult (Stanczyk et al., 2017). Wiengarten et al. (2017) find that purchasing practices become less effective in terms of operational performance when the geographical distance between the trading companies increases, while Bode and Wagner (2015) report that an increase in spatial complexity (i.e., geographical distance) leads to an increase in the frequency of supply chain disruptions. Lack of spatial proximity restricts the applicability of Just-in-time sourcing and logistics (Holweg et al., 2011), and it can prevent or stall also other collaborative practices due to reduced face-to-face interactions as well as socialization opportunities (Schneider et al., 2013). Finally, geographical dispersion brings political, cultural, and institutional differences to the forefront (e.g., Handley and Benton, 2013; Larsen et al., 2013) thereby leading to a lack of common understanding between the interacting partners. Additionally, geographical dispersion also brings forth complications surrounding the adherence to diversified

global standards (Kotabe and Murray, 2004). Literature has suggested that firms would increase formal control (i.e., formalized contracts, and/or centralized control) when facing increased structural complexity (Choi et al., 2001; Choi and Hong, 2002; Schmoltzi and Wallenburg, 2012). Yet, in global sourcing relationships involving Chinese suppliers this could be obstructed by the differences in how the Western and Asian managers view the nature of the contracts (Wieland et al., 2020) and by the operational difficulties and cost of direct monitoring (Handley and Benton, 2013).

2.4.2 Sourcing Process Complexity

We define sourcing process complexity as the totality of complexities emanating within each stages of the sourcing process. When it comes to the sourcing process, various models have been offered by practitioners such as Deloitte Consulting and AT Kearney (Smeltzer et al., 2003) and academics (e.g., Levina and Su, 2008; Monczka et al., 2004). While these models may contain differing numbers of phases (steps) or may use different labels to describe procurement events, they all present the sourcing process to comprise certain sequential events that broadly include *profiling the purchasing category, supplier selection, negotiation, and compliance* (Monczka et al., 2011; Tate and Ellram, 2009).

Given that the stages of the sourcing process are a sequence of tasks, we build on the literature related to task complexity to operationalize the complexity. Specifically, for a task (i.e., a stage in the sourcing process) to be complex, it needs to exhibit high levels of information load, diversity, and/or uncertainty (Campbell, 1988; Handley and Benton, 2013). Scholars have considered different sets of sources that could lead to task complexity (c.f., Campbell, 1988; Handley and Benton, 2013; Wood, 1986). In our case, we consider product and the sourcing environment as key drivers of complexity within each stage of the sourcing process.

On the one hand, complexity of a particular stage could be driven by product characteristics such as the number of components, interactions among these components, and the degree of product novelty (Novak and Eppinger, 2001). For example, during the profiling stage, these product characteristics could make specification of requirements quite challenging, thereby increasing not

only the uncertainties in determining user requirements, but also the need for vast amount (information load) as well as diversity of information (Mahapatra et al., 2010; Roth et al., 2004). On the other hand, complexity could also be high when the product being sourced is relatively simple. Specifically, the complexity of a particular stage could also be influenced by characteristics of the sourcing environment (e.g., Handfield and Straight, 2003; Kraljic, 1983; Olsen and Ellram, 1997) such as the heterogeneity as well as the readiness of suppliers, environmental regulations surrounding the purchasing category, etc. For example, during the selection stage of the sourcing process, heterogeneity of suppliers could lead to the need for diversity of information, while supplier's degree of readiness could be a source of significant uncertainty².

Sourcing process complexity has a significant impact on relationship governance. Supply market characteristics dictate the adoption of appropriate governance mechanisms; the lack of availability of qualified suppliers increases dependence, thereby requiring the buying firm to rely heavily on relational governance mechanisms that clearly signal a long-term orientation (Ganesan, 1994; Lusch and Brown, 1996). Increased sourcing process complexity would require the buyers and suppliers to become involved in a greater number of planning and coordination activities. As these activities are subject to failures, complexity increases the possibility of errors and risks at exponential rates (Mesquita and Brush, 2008), thereby mandating that appropriate governance mechanisms are put in place. Among others, this would require the adoption of more complete contracts that could cover all possible issues (Poppo and Zenger, 2002). At the same time, given the adaptive limits of contracts in such situations, firms might also have to combine contracts with alternative governance mechanisms. Even in cases of benevolent relationships, higher levels of information load, diversity, and uncertainty resulting from increased process complexity can impede the ability to not only estimate costs and other requirements accurately, but also measure performance outcomes (e.g., Zhou and Poppo, 2010). In summary, given that higher sourcing process complexity requires timely sharing

² See Appendix A for a summary of other potential sources that could lead to higher complexity of the different stages of the sourcing process

information and resources as well as speedy coordination between the partners, it may have a profound effect on the governance mechanisms adopted to ensure high-performing buyer-supplier relationships (Graff, 2004; Schmoltzi and Wallenburg, 2012).

Given this overall theoretical background, our study seeks to understand how specific context factors – namely, structural and process sourcing complexity – help explain the governance of high-performing WB-CS relationships. Additionally, keeping in view Cao and Lumineau (2015)’s argument that transactional and relational mechanisms could act either as complements or substitutes depending on specific contextual factors, we also examine the influence of structural and process sourcing complexity on the combination or non-combination of transactional and relational governance mechanisms in these relationships.

3. METHODOLOGY

We adopted a multiple case study research design for our investigation. Three reasons drove our choice: (a) a paucity of studies examining the impact of contextual contingencies in the WB-CS exchange. Case studies are useful for investigating into systems that are influenced by multiple contingencies (Meredith, 1998); (b) case study research is appropriate to address the “how” type of questions (Yin, 2009); (c) given the contrasting empirical findings regarding whether or not to combine transactional and relational governance in the WB-CS relationship, the closer look offered by the case study approach can help in disentangling the confusion surrounding this debated topic.

3.1 Sampling and data collection

A multi-step theoretical sampling approach was chosen to select the cases (Eisenhardt, 1989). We aspired to select “polar extreme-type” cases as the sharply contrasting characteristics would help us to identify intriguing patterns during case analysis (Eisenhardt, 1989). Thus, we targeted companies to be included in the sample that distinctly contrasted along the two contingencies while at the same time sharing some common traits that could allow us to control for potential confounders. In particular: (a) we focused only on recognized market leaders; (b) we limited our study to those companies whose activities in China had been established no later than 2005; (c) we asked the

informants to only consider relationships that were active for at least 3 years (Chiao et al., 2008); (d) We ensured that the informants chose an indigenous supplier with whom they have had an effective and high-performing relationship. We characterized high-performing relationship as one that showed good supplier operational performance (Giannakis et al., 2012), negligible opportunistic behaviour (Wang et al., 2016; Zhou and Xu, 2012), and a general overall satisfaction with the relationship (Li et al., 2010). Although there could be cases where poorly designed governance results in poor performance, we follow Mills et al. (2010) and intentionally excluded these cases since we wanted to focus on exemplary cases – having effective relationships. In doing so, we were able to control for various confounders and study the effects of our selection variables (sourcing structural complexity and sourcing process complexity) on governance mechanisms.

Italy is one of the most important economies in the Western World, and it is the second-largest manufacturing country in the European Union. Additionally, China is an important market for Italian manufacturing companies (Mariotti and Mutinelli, 2017). Therefore, Italian companies are good representatives of the Western side in studying WB-CS relationships. Past research focusing on the relationships of Italian companies with Chinese suppliers have clearly characterized these exchanges as of “WB-CS” type (e.g., Nassimbeni and Sartor, 2007). We first analysed the general profile of more than 200 Italian companies listed in the Italian Chamber of Commerce in China and “Osservatorio Asia”³ databases, holding a subsidiary in China. We initially looked for companies with a clear contrast in the degree of complexity of their final products since we thought that this diversity could at least increase the likelihood of finding variance along the dimension of process complexity. We identified a first list of 8 companies that could fit our research design. During a first trip to China, two members of the research team jointly visited the subsidiaries of these companies. These meetings were intended to finalize the list of cases and the purchasing categories to be considered within each case. A product category for each of the 8 case companies that satisfy all the

³ A well-respected non-profit organization that monitors the presence as well as supports the activities of Italian firms in Asia.

control requirements was selected and information was collected regarding the structural and process sourcing complexity.

We then conducted individual analysis of the different aspects of complexity to create a final assessment of process and structural complexity. Based on individual assessments, three members of the research team classified the process complexity of each stage of the sourcing process as low, medium, or high. We then combined these assessments to construct a final classification of the process complexity for the selected purchasing category. In cases of conflict among individual assessments, the research team discussed and then clarified the issues to reach consensus – the resulting inter-rater reliability was found to be 0.93 (e.g., Voss et al., 2002). At the same time, we analysed the collected information to categorize the structural complexity as either low (i.e., local sourcing abroad) or high (i.e., integrated global sourcing). Eventually, we were able to collectively identify 4 exemplar cases (with an appropriate purchasing category) providing the strongest contrast along process complexity (i.e., high vs. low) and structural complexity.

Data from these 4 companies were collected in multiple rounds of interviews including one more trip to China, direct visits to the Italian HQs of the companies, and videoconference interviews (refer to: Table 1 for the informants' profiles and the additional data sources used in the research; Table 2 for more information on the data collection phases; Appendix B for the interview protocol). Our semi-structured interview protocol included aspects specific to international buyer-supplier relationships as well as general questions on the dimensions of sourcing complexity and governance mechanisms. The unit of analysis in each of case studies was the high-performing WB-CS relationship for the selected product category. Overall, we conducted 40 interviews with informants of the four case firms⁴, that spanned over 65 hours.

--- Insert Table 1 and 2 about here ---

3.2 Data analysis

⁴ We also conducted 8 interviews with managers of the remaining 4 companies included in the initial list.

In analysing our data, we followed the three-step procedure proposed by Miles et al. (2013) consisting of (a) data reduction, (b) data display, (c) drawing conclusions. In data reduction we used a blended approach combining deductive codes (drawn from the literature) and inductive codes (Linneberg and Korsgaard, 2019) since we wanted to remain open to aspects that we had not found in the literature (e.g., elements of complexity that are more specific to the Chinese context). Initially, two members of the research team individually developed a list of first-cycle codes (Miles et al., 2013) and then jointly worked to eliminate the discrepancies. A third member was involved in the process to address the most debated cases. Then, the same two members separately coded the four cases and developed their lists of second-cycle codes: the process of comparison between individual coding described above was reiterated until consensus had been reached. To display data, we used spreadsheets and made ample use of matrices (e.g., presence-absence matrices) to effectively visualize the salient characteristics of each construct and of its subcategories. This facilitated our investigation of the possible linkages between the various constructs and the identification of patterns emerging at the case level. To ascertain the validity of our interpretations, we (a) compared these patterns to the contextualized narratives of the cases, and (b) shared and validated our conclusions with our key informants. Finally, we compared and contrasted the different cases to identify the recurrent paths that we eventually systemized and formalized into our propositions. To overcome potential researcher bias, we utilized multiple data and we also interviewed multiple informants per company (Meredith, 1998).

4. WITHIN CASE ANALYSIS

Figure 1 presents some basic details about the four cases. For confidentiality reasons, we have used nicknames to identify the cases. Please refer to Table 3 for a summary of our within case analysis and to Appendix C for illustrative quotes representing the key variables (and relative values) of the study.

--- Insert Figure 1, Table 3 about here ---

4.1 HI-MECH (HM)

HI-MECH is a leading company in the design and manufacturing of machines for the pharmaceutical industry (drug production and packaging). The product has a complex architecture and stringent mechanical requirements to ensure safety and reliability. We selected “critical gears” as the purchasing category. They are core for the product’s performance given their direct impact on effective power transmission, and functioning (e.g., low vibrations). Local sourcing abroad is the prevailing sourcing structure since specialization of critical gears reduces the opportunities for purchasing integration among product families.

All the phases of the sourcing process for critical gears show a significant degree of complexity. Particularly, finding appropriate suppliers in China is extremely challenging, since the few suppliers that possess the unique technical capabilities and skills required usually prefer to focus on larger-scale businesses (e.g., automotive). Supplier selection has to be based on supplier’s potential rather than the actual readiness to supply. Compliance is also significantly complex given the usually subtle reasons of quality rejections – that increase the potential for disputes and supplier discouragement; Further complication to the compliance phase descends from the Chinese suppliers’ inclination to hide difficulties: HM’s buyer in charge mentioned that a gear supplier requested to perform bluing [a steel coating process that protects from oxidation and leaves the gear surface black] painted the surface black with a marker pen, in an attempt to conceal the defects of its treatment.

Finding a good supplier was initially tough for HM. Two small companies HM tested for almost two years never reached the desired quality level. Eventually, HM was able to find, and develop satisfying relationships with two local sources – Supplier A being the most important of them. It is a family-owned business located close to HM’s plant. Admittedly, Company A was not immediately ready to produce HM’s complex gears: *“They were making gears for products such as lathes and gearmotors, whose complexity is not comparable to ours. But they showed interest in starting a business with us: they glimpsed an opportunity to grow by developing really novel competencies. Learning is something that the Chinese supplier really tends to value”* – the buyer in charge said. HM understood the need for embracing a long-term perspective (i.e., structural relational

governance) in the relationship, given the challenges raised by the high process complexity. This meant also sustaining burdens in the supplier's learning process. As explained by HM's CPO, *"It takes time for the supplier to understand how to properly manage a low-volume, high-variety business like ours which also requests significant technical expertise. For this reason, it was important to 'protect' this promising relationship, especially in its early stages, from the issues that would inevitably arise. For example, we agreed with supplier A that for the first three months we would reimburse the cost of the raw material even for the items that we discarded"*. In addition to such a long-term relationship orientation, several other elements proving a high degree of both structural relational governance and process relational governance are evident in the relationship (please refer to Table 3 and the quotes included in Appendix C). Still the high economic and relational effort made by both parties is justifiable only if it produces results at some point. Yet, complexity in the technical process, as well as in the effective communication of performance expectations, can easily lead to problems. Therefore, this relationship also seemed to require intense centralized control, including prescription of specific quality control procedures that Supplier A has to follow, and direct selection of A's most critical second tier suppliers (e.g., thermal treatment supplier). These controls also allow a continuous feedback towards the supplier that prevent it from repeating the same errors. Physical proximity between the only two interacting entities helps the viability of these controls. On the other hand, formal agreements are limited to basic order specifications and a "price list" used to simplify negotiations every time a new order is issued. Such little degree of formalization adopted is motivated by the increased effort that a detailed specification would require, and the fact that certain aspects (e.g., unforeseen quality controls) cannot be precisely specified a priori.

4.2 TOP-CHEM (TC)

TOP-CHEM holds a leading position in manufacturing phosphorus derivatives (lubricant oil and plastic flame retardant additives). The manufacturing process for the phosphorus derivatives is complex; during the process, the several chemical reactions and treatments conducted are not only dangerous, but could also result in environmental pollution. We focused on yellow phosphorus and

its derivatives⁵, the most important purchasing category for TC. TC purchases it for its Chinese and Western subsidiaries (i.e., integrated global sourcing). Specifically, the HQ holds authority on supplier validation and selection, negotiation, and control based on the company's aggregated requirements.

The sourcing process is complex. In the profiling phase, complexity arises due to several technical, environmental and safety issues that have to be considered; this complexity is further compounded by the Chinese suppliers' lack of familiarity with some of these issues as well as their reluctance to raise questions when they do not comprehend these issues. The high standards for product quality (e.g., product purity) required by TC substantially limits the supply base. Finally, there is significant difficulty in compliance, due to stringent quality targets, handling of hazardous material, as well as frequent, and often unpredictable, externalities that can impact the sourcing process. The Subsidiary CPO observed, *"It is surprising how many factors can affect our supply chain in China. Time ago, the shipment from two suppliers was delayed for two weeks since the local governmental agency ordered that their trucks had to be used to transport coal to the electric power plant, in replacement of the railway transportation that had to undergo an urgent maintenance work"*.

TC has 4 suppliers for this purchasing category with supplier B being the main one. TC uses formal contracts to purchase yellow phosphorus. The contract has a high degree of completeness, with ample technical specifications and quality requirements, and mechanisms of price adjustments. TC considers the contract to be the main element of governance in the relationship. The Corporate CPO noted: *"With the key raw material coming from China to feed our capital-intensive manufacturing process, the supply chain has to be reliable because corrections (e.g., air freight) are costly and difficult to act in a global context. Our experience with Chinese suppliers taught us that in many cases they tend to commit to more than what they can deliver. By providing a set of general*

⁵ The category is reasonably homogeneous as the derivatives are further elaborations of yellow phosphorus. TC categorizes these products as a single purchasing category termed "yellow phosphorus and derivatives".

rules (e.g., confirmation of order acceptance) and making the terms explicit, contractual provisions help to establish an ‘operating way’ that enhances the supply chain’s reliability”.

Yet, TC is aware that this contract-led operating way is still exposed to the risks of a highly complex sourcing process. Centralized control practices are specifically employed to mitigate these issues. The Subsidiary CPO observed, *“The high performance of our products depends, in part, from particular properties of the yellow phosphorus supply – e.g., extreme purity – that need to be carefully monitored during the production process. To that end, we both prescribe specific quality controls to check for certain impurities, and we check that they are properly implemented”*.

At the same time, TC relies also on relational governance in response to the various challenges it faces. Given the difficulties in finding and validating suitable suppliers, TC believes that a long-term orientation is desirable. It is committed to support supplier B in improving both its process (e.g., scrap reduction) and environmental sustainability (e.g., adoption of appropriate filters for the fumes). Also, the preferred relationship established with the supplier can help TC to effectively counteract exogenous criticalities. The buyer in charge reported an episode of that kind: *“Some time ago the local government has ordered planned electric power stoppages as a measure to contain air pollution. The contract in place with supplier B did not include provisions for such cases. Company B was willing to work extra-time before the stoppage to create a stock for us and we paid them a bonus for that. At the end, we agreed to include that ‘amicable agreement’ in the next contract update”*.

4.3 HEAT

HEAT is a world leader in the aluminium radiators market. It achieves product differentiation through exclusive design (e.g., bi-metal radiator) and superior know-how in aluminium die-casting and surface finishing that result in higher aesthetic quality. We focused on the aluminium alloy, HEAT’s main purchasing category. Given the limited price gaps between different sourcing markets and the high transportation costs, HEAT adopts local sourcing abroad in China. Aluminium is purchased as ingots and re-melted at the beginning of the radiator’s production process. Product

characteristics are well-established – HEAT only adds some further, easy-to-specify customizations on chemical composition of the alloy (e.g., max allowance of certain impurities). Besides, the aluminium price set at the domestic stock-exchange can be taken as the starting reference point for price bargaining, making negotiations easier. Abundance of alternative suppliers for a purchase with simple profiling and negotiation contributes to low sourcing process complexity.

HEAT adopts a multiple sourcing strategy to exploit supplier competition and overcome limitations in suppliers' capacity. At the same time, it works to ensure continuity in its production process through a timely and smooth material flow from its suppliers. As the Subsidiary CPO noted, *"Given the important investment we made in this plant, avoiding interruptions in production is really a priority to us"*. Company C – the supplier we selected for our analysis – is one of the HEAT's 10 aluminium vendors. The relationship between the two companies has been relatively continuous, and satisfactory, over the past years; however, HEAT does not consider C to be more privileged than others. HEAT adopts simple, short term (1-3 months) contracts that specify the very basic exchange terms. At the same time, it relies on varied forms of centralized control, mainly in order to ensure quality compliance (e.g., through rapid detection of quality issues) and on time delivery. HEAT first conducted an extensive audit of C's production system, to check its suitability with the firm's requirements. It then requests specific (although relatively standardized) quality controls to be performed both during the production process. HEAT's Corporate CPO stressed the importance of these controls: *"The Chinese suppliers, including C, typically recover aluminium from scraps which might contain a higher degree of impurities compared to the pure raw material. These impurities, in turn, can compromise the outcome of our aluminium die-casting, a process that is quite sensitive to variations in the parameters of the input material. However, these deviations in the product's characteristics can be detected through relatively standardized quality controls, which are those we prescribe to the supplier"*. Physical proximity, one of the key characteristics of low structural complexity, facilitates the effectiveness of the control system by favouring timely recovery actions: *"Complete rejection of a delivery is rare; but more than often the supplier might be required to*

counterbalance the (incorrect) chemical composition of the current delivery by changing the composition of next delivery” – Supplier Quality manager reported. In effect, he alluded to the fact that timely counterbalancing of incorrect chemical composition of a previous delivery was possible only due to the proximity of the supplier.

Collaboration between HEAT and supplier C is low and limited to operational issues. HEAT has invested in basic forms of supplier development aimed at improving the supplier’s quality (e.g., correct procedures in lab tests and quality controls).

4.4 GRIP

GRIP is one of the world’s main players within the tire industry. It is a MNC with more than 20 plants spread across the globe. As automakers globalize vehicle platforms, similarities of the tire characteristics among different markets also increase, although regional customizations still exist. Since tire cord is one of GRIP’s main purchasing categories, we chose it for our analysis. GRIP integrates sourcing of the tire cord on a global scale. It buys tire cords in China – the world’s main supply market – for both local and several Asian and Western subsidiaries.

Overall, sourcing process complexity is low for this purchasing category. Industry standards are well established, and the supply market offers a relatively broad base of competent suppliers that suit GRIP’s needs. When compared to the other phases of the sourcing process, the negotiation phase is relatively more complex as it encompasses some issues – e.g., CSR aspects – that can be less familiar to suppliers. This might lead to multiple requests of renegotiations.

We examined the relationship between GRIP and Supplier D, one of its six Chinese tire cord suppliers. Formal contracts are the principal governance mechanism adopted in this relationship. GRIP’s managers emphasise their importance in dealing with implications of a global supply chain such as, e.g., variety in the plants’ requirements. *“Industry standards increase the amount of common specifications in our product range, yet differences between our various plants worldwide continue to exist. For example, the cord-cutting equipments are not the same at any two plants; they typically require different length and weight of the rolls. The contract permits us to manage these aspects well;*

it consists of a general agreement, whose provisions are valid for the supply to any plant, and of appendices that list the specific needs at a given plant", GRIP's CPO reported. Contracts also mitigate the risk of free-riding behaviour in the multi-agent scenario (e.g., under conditions of product shortage). As the buyer in charge explained, *"In the case of product shortage, suppliers tend to pursue their own interest, meaning that they will favour either the local subsidiary or the foreign plant which absorbs the greatest volume. But this may conflict with the prioritization that we have at the group level. The contract helps us to resolve these potential issues, since it clearly specifies that in case of product shortage, the HQ is entitled to establish which plants will be served first"*. Finally, contracts seem to be requested also due to the increased liabilities implied by integrated global sourcing (e.g., costs of a product recall due to a supplier's defective lot). GRIP's contract terms, in practice, address most of the issues that could materialize in the transactions. Though Supplier D had previous business experiences with other Western customers, it showed limited confidence towards formal contracts in the beginning stages. GRIP spent considerable amount of time clarifying the contract terms (e.g., customer's expectations and consequences for noncompliance).

Easiness of product profiling and the well-established tire cord production technology relieve GRIP from employing significant level of direct controls in this relationship. In fact, GRIP only controls the supplier's deliveries on a random basis, and it shares a quarterly performance scorecard that can include warning for penalty risk in cases of performance degrades, thereby preventing any supplier complaints.

All current suppliers are considered to be equal, and bidding process is used to assign future business. Essentially, relational governance appears to be almost negligible in the GRIP-Supplier D relationship: neither supplier development activities nor joint initiatives are undertaken in this relationship; collaboration is limited to operational aspects aimed to favour logistics efficiency and timely delivery.

5. CROSS CASE ANALYSIS

In this section, we aim to identify different patterns of governance mechanisms that are evident across the case firms. All the purchasing categories were strategic in nature and involved the best performing Chinese suppliers. All relationships had been established over 3+ years, and characterize scenarios that exhibit contrasting differences in structural and process sourcing complexity. We first of all observe that while sourcing complexity stems from the configurational elements (i.e., local vs. global) of the relationship and from the product's features, it also originates from specific aspects of the Chinese context in terms of: peculiar attitudes and behaviours in the relationship (e.g., communication issues such as reluctance to disclose problems; tendency to ask frequent renegotiations); local supply markets' characteristics (e.g., lack of suppliers' technical readiness to supply; heterogeneity of the suppliers); higher uncertainty and higher exposure to externalities. Our field evidence suggests that the case firms had to consider these factors while shaping their governance mechanisms in their relationships with the Chinese suppliers.

We note that under conditions of low overall sourcing complexity (i.e., low structural and low process complexity: HEAT case), a rather simple governance form is adopted – comprised of agreements with minimal specifications, and moderate levels of centralized control. Through these controls, the typical issues that characterize HEAT's purchase can be prevented or rapidly detected as well as corrected with limited effort – given also that physical proximity facilitates the interaction between the two entities involved. Therefore:

Proposition 1: In Western buyer-Chinese supplier relationships that exhibit low overall sourcing complexity, it suffices to have only moderate level of centralized control.

5.1 Impact of structural complexity on governance

When we compare the cases of low vs. high structural sourcing complexity, a difference in structural transactional governance is clearly visible. HEAT and HM, the two cases of low structural complexity, utilize quite simple contracts, which in the HM case is limited to just the basic purchase order specifications. Alternatively, contracts are used extensively when structural complexity is high. In both cases – GRIP and TC – the contracts are highly formalized (i.e., include several specifications

regarding logistics, quality, imposition of penalties, grounds for terminating the relationship, etc.), and they are seen as a fundamental tool for both coordination and safeguarding in the integrated global sourcing. The higher number of players involved as well as their geographical dispersion in these scenarios result in a large number of specific requirements and heterogeneous standards that complicate the coordination between the buyer's worldwide plants and the supplier. Besides, geographical distance hampers task synchronization and makes remedy measures expensive. By explicitly defining the terms of the exchange and outlining standard operating procedures, contracts help to reduce misunderstanding and improve coordination. Highly formalized contracts also minimize opportunistic behaviour that could arise from hidden agendas: for example, as seen in the GRIP case, suppliers could opportunistically favour certain subsidiary if they encounter product shortages. Finally, contracts could also offer formal safeguards against higher risks/damages as well as ensuing costly remedy measures resulting from high structural complexity. Instead, structural complexity did not seem to have any impact on both structural and process relational governance mechanisms. Accordingly, we forward the following proposition:

Proposition 2: In Western buyer-Chinese supplier relationships, as structural complexity increases, structural transactional governance increases.

5.2. Impact of process complexity on governance

Process complexity did not seem to have any impact on the adoption and the completeness of contracts. We noticed that extensive contracts were adopted in the cases of both low and high levels of process complexity. Instead, in the case of centralized control, we find that the frequency as well as the intensity of audits, inspections, and direct control over the second-tier suppliers increases with process complexity. For example, among the cases of low process complexity, GRIP adopts a very weak form of control that essentially pertains performance monitoring. As discussed earlier, HEAT engages in periodic inspections, material and quality control to ensure the smooth material flow from its supplier; but this is lower compared to the cases of high process complexity. Alternatively, all forms of centralized control increase as we move from low to high process complexity. Both HM and TC buy products with specific requirements that are not familiar to the Chinese suppliers;

communication difficulties due to language barriers, and to the suppliers' hesitancy to request more explanations could lead to the misinterpretation of these requirements. The suppliers might lack a full understanding of the relevance that these specific characteristics have for the customer's product performance, and therefore not pay full attention to them. This not only raises risks of non-compliant performance, but can also lead to disputes and failures in the relationships. In response to that, both HM and TC employ high degrees of process transactional mechanisms. HM's buyer in charge said:

"Controlling the supplier A's process and quality is a critical part of our job. The fact is that our product is much more complex than all the others the supplier makes. Our stringent control over the supplier helps significantly in reducing the occurrence of defects and non-compliance; it also conveys the supplier how much rigor and precision matter to us"

It follows that:

Proposition 3: In Western buyer-Chinese supplier relationships, as process complexity increases, process transactional governance increases.

Process complexity is also seen to have a strong influence on the adoption of both structural and process relational governance mechanisms. Our analysis suggests that the extent of structural relational governance mechanisms increases with process complexity. Such mechanisms are almost non-existent in the cases of low process complexity – HEAT and GRIP. These companies do not see the need for long-term relationship orientation or relationship-specific investments as they maintain the relationship based purely on supplier competitiveness. On the other hand, structural relational mechanisms are quite significant in the cases of HM and TC; both of them invest heavily in relationship-specific assets and consider maintaining (and possibly strengthening) relationships with their suppliers to be of paramount importance. HM's CPO illustrated the importance of these mechanisms for maintaining (and possibly increase) the relationship attractiveness to the supplier, in a highly dynamic business environment like the Chinese one:

"We learnt how important it is for the supplier to win new business. In a rapidly growing economy like China, you can really 'touch' this strong aspiration that local firms have to increase their own business. Assigning new business is an effective way to convey your commitment to the relationship; to this the supplier always responds with an intense effort to improve".

As for process relational mechanisms, we find their adoption to increase as process complexity increases. Even though exchange of information occurs in HEAT and GRIP (low complexity cases), it is limited to basic demand and logistics information. Supplier development and joint initiatives are either weak or absent in both these cases.

Alternatively, in the cases of high process complexity, there is also exchange of information on operational and financial issues. Integration and joint efforts are intense and typically revolve around either solving problems or improving processes (e.g. quality improvement). TC's buyer in charge reported:

"Sharing cost details has been quite helpful in the relationship with supplier B. Initially, the supplier used to ask frequent price renegotiation, thereby causing tension in the relationship. We proposed them to analyse their costs together saying that we were ready to grant a price increase, if justified. The analysis revealed the cost of scraps was disproportionate. That was unexpected since they had passed our initial audit. Further investigation showed that while the filtering and cleaning equipment was appropriate, they were having trouble in setting it the right way – causing excessive scraps. We provided the technical support that helped them to resolve the problem"

In the HM and TC cases, stringent product/supply requirements pose severe challenges to the Chinese suppliers and do make failures in the supplier's process more likely. Yet, replacement of suppliers would be costly and time-consuming given the limited alternatives available in the local supply market. On top of that, complications also stem from several external uncertainties that affect the Chinese business context, as seen particularly in the TC experience. Under these conditions, the continuous improvement of the supplier's capabilities seems to be required to ensure smooth functioning of the relationship. Higher levels of relational governance mechanisms facilitate this process through direct forms of knowledge transfer (e.g., joint problem solving; supplier development) and by triggering the supplier's commitment and related resources investments into a relationship that it perceives as valuable. At the same time, relational governance stimulates a sense of reciprocal obligation that favour amicable adjustments and continuity of the relationship. Accordingly, we advance the following proposition:

Proposition 4: In Western buyer-Chinese supplier relationships, as process complexity increases, structural and process relational governance increase.

5.3. Combined impact of structural and process complexity

Now we focus our attention on the simultaneous effect of the two contingencies. Within a given type of structural complexity, the extent of adoption of centralized controls as well as structural and process relational governance mechanisms increase as the process complexity increases. However, no matter the level of process complexity, contracts are almost not adopted when structural complexity is low, while they are adopted when structural complexity is high. Taken together, all forms of governance mechanisms are increasingly adopted when we move from low to high structural complexity / process complexity.

Evidence from the cases hints that firms choose to combine transactional and relational forms of governance when facing operating conditions – particularly, high process complexity – that reduce the effectiveness of the single mechanism(s): e.g., in the TC case, relational governance remedied the shortcomings associated with contractual incompleteness (i.e., the lack of specific contractual provisions for planned electric power stoppages ordered by the local authority). While the process complexity is high, the move from high to low structural complexity eliminates the need for highly detailed contracts. However, the other forms of governance mechanisms are still applied to a greater extent. HM's Subsidiary CPO noted:

“Collaboration and mutual trust between supplier A and us have grown substantially over these years. Yet, there are parts of the production process we still prefer to control, e.g., critical surface treatment. These are long, expensive, and require deep attention as well as a constant monitoring of several parameters. On top of that, a defect that originated in the production process can manifest itself even months later – when our machine is already in use at our customer's plant. Attributing accountability becomes difficult at that point. We can't risk to create a problem to our customer because our supplier underrated the consequence of working with an imprecise thermal gradient in quench hardening, or one of its line operators cuts few minutes to a process since he is late with his daily schedule!”

Based on this analysis, we propose the following:

Proposition 5: In Western buyer-Chinese supplier relationships, a combination of transactional and relational governance mechanisms is necessary when there is high process complexity. In that case, if structural complexity is low, it suffices to only have process transactional governance, but if structural complexity is high, both structural and process transactional governance mechanisms would need to be adopted along with relational governance.

6. DISCUSSION

6.1 Theoretical implications

Our study makes three broad contributions to theory. First, we offer a novel contribution by empirically illustrating the effectiveness of different governance forms while managing high-performing WB-CS relationships. The choice of governance mechanisms seems to be dependent on contextual contingencies: our results show that the extent of centralized control, contract formalization, structural and process relational governance is distinctly different under different levels of structural and process complexity. Undertaking a contingency based perspective, we respond to the explicit call by scholars to consider contextual factors while analyzing the WB-CS relationships (Li et al., 2008; Lihong and Goffin, 2001; Liu et al., 2009), and we unearth interesting dynamics pertaining to two fundamental governance mechanism. With respect to contracts, differences in how the Western and Chinese managers view the nature of the contracts continue to raise uncertainty on their role, and actual effectiveness, in the WB-CS exchange (Wang et al., 2016; Wieland et al., 2020). Kang et al. (2012) noted that most of the extant studies only consider the perspective of the MNC's headquarter, and raised a need to investigate governance of WB-CS relations from the subsidiary's one as well. Our study suggests that the distinction is useful to shed light on the role of contracts in exchanges, since different approaches to contract formalization are taken by agents from different organizational units (i.e., the local subsidiary vs. the HQ). Specifically, under high structural complexity, the agents of the HQ are reluctant to give up the protection of the contract, which not only appears as a necessary condition for operating the deal, but also conforms to the Western standards (e.g., multiple contractual obligations: Wieland et al., 2020). Instead, under low structural conditions, the agents of the local subsidiary seem to attach less value to contract formalization, more in line with the local business practice. With respect to relational governance, an ongoing debate exists regarding whether or not inter-personal linkages ("guanxi") continue to play a fundamental role in managing business relations in China. While some studies provide some evidence that factors such as market liberalization, as well as Chinese firms' increasing familiarity with the business practices of foreign companies could lead to a decreased importance of guanxi (Wilson and Brennan, 2010; Zhang and Keh, 2010), others continue to remark its importance (Giannakis et al., 2012; Salmi et al.,

2006). Our study contributes to this debate as it suggests that relational governance plays a pivotal role only when process complexity is high. As such, it supports the argument that guanxi might not be required under all circumstances. At the same time, it offers a nuanced understanding of the centrality that relational governance still has in exchanges with high risk of supplier failure and lack of alternative sources. Here, relational governance plays a fundamental role in making the relationship attractive for the supplier – in spite of the high investments requested and of the alternative opportunities the supplier can find on the dynamic Chinese market – by offering “assets” (e.g., learning opportunities; rapid and tangible increase of volumes) the supplier seems to value more than contractual provisions for future business. At the same time, the intense and open communication (e.g., in joint problem solving) helps to establish an amicable climate between the two firms and, over time, mitigates issues such as the Chinese supplier’s tendency to hide difficulties.

Second, our research helps to understand when (i.e., under which conditions) and how to combine governance mechanisms within the context of WB-CS relationships. Differently from the case of domestic (generally Western) contexts, only a few studies (e.g., Li et al., 2010; Luo, 2002; Zhou and Xu, 2012) analysed the combination/non-combination of governance forms in the WB-CS relationships. Recent contributions (e.g., Cao and Lumineau, 2015; Howard et al., 2019) showed that the distinction between “complementary” and “substitute” roles of transactional and relational governance forms is probably too simplistic. More nuanced explanations can be provided by taking into account, e.g., the specific contextual factors (Cao and Lumineau, 2015). Our study supports this approach, and in doing so it also extends the limited literature available (e.g., Aben et al., 2021; Roehrich and Lewis, 2014) examining when and how governance mechanisms could be combined in light of complexity. Our results suggest there are specific situations in which one (or both) transactional mechanism(s), and relational mechanisms, could actually act as complements. Specifically, in cases of high process complexity/low structural complexity, firms must adopt centralized control along with the two forms of relational governance. High process complexity can likely determine a lack of understanding that could result in mutual suspicion, and even in a sense of

betrayal among the partners (Luo, 2007; Macneil, 1978). For example, the supplier might suspect the buying firm to opportunistically reject consignments – pretending the quality is not adequate enough – as a mean to hide its inaccurate (i.e., overestimated) forecast of customer demand (Narayanan and Raman, 2004). Relational governance mechanisms provide a framework that could minimize the debilitating effects of lack of understanding and information asymmetry through timely information sharing and joint efforts, as well as mutual forbearance (Zaheer and Venkatraman, 1995; Zhou et al., 2008). Yet, sole reliance on relational governance mechanisms could still offer the chance of opportunistic behavior in light of higher levels of information asymmetry and uncertainty (Mesquita and Brush, 2008; Williamson, 1996). For example, while one party could forebear the performance and order discrepancies in light of imprecise and ambiguous requirements, this presents a unique situation within which opportunistic behavior of the other party could be wrongly perceived as honorable. That is, the presence of trust need not always indicate the absence of opportunism (e.g., Lado et al., 2008; Lewicki et al., 1998). Accordingly, adhering to the “trust-but-verify” approach advocated by Lewicki et al. (1998), centralized control could actually complement relational mechanisms by serving as a cross-checking mechanism that keeps opportunistic behavior at bay, and also helps in identifying problems and issues that could pave the way for future collaboration/developmental initiatives, thereby enriching the relational exchange between the partners (Lado et al., 2008; Paulraj and Blome, 2017).

Alternatively, we notice that all governance mechanisms are used in tandem in the case of high process complexity/high structural complexity. While, as seen, the complications pertaining to high structural complexity require the formal protection of the contract, in this case contracts will also be drafted to provide protections against the challenges posed by process complexity (e.g., information asymmetry, measurement difficulties, etc.). Yet, this intent could render contracts incomplete and partially ineffective (e.g., Mesquita and Brush, 2008; Williamson, 1985; Zhou and Xu, 2012). Therefore, though contracts could provide an initial legally binding framework within which the relationship could work, centralized control will help in enforcing the contract, reducing

the risk of contract failure, while relational mechanisms can remedy the inherent limitations of contract incompleteness by promoting a more collaborative attitude in resolving unexpected contingencies (Dyer and Singh, 1998; Li et al., 2010; Luo, 2002).

While examining combination of governance mechanisms, we noticed that while structural and process transactional mechanisms could be used together or in isolation, structural and process relational mechanisms seem to always go hand in hand. Since we are not aware of any literature that specifically discusses this phenomenon, we attempt to offer some rationale for why this might be the case. Can a firm just rely on structural relational mechanisms alone? Since the limited supply base and increased share of business given to the supplier, this could increase the dependency on the supplier firm. In such cases of increased dependency, it will also be too risky for the buyer firm if the suppliers are unable to achieve the required performance level on their own. But when process relational mechanisms are adopted simultaneously, they could ensure closer interactions between the exchange partners through which the likelihood of the supplier firm meeting the performance goals would be higher. Alternatively, can a firm just rely on process relational mechanisms alone? Developing such mechanisms require significant time and effort (e.g., Dyer and Singh, 1998; Paulraj et al., 2008); it will only be justified in the case of significant amount of business and working for a long period. In other words, the structural relational mechanisms could provide the much-needed incentive for the suppliers to work closely with the focal firms to meet their needs. Therefore, companies will have to start with at least some levels of structural relational governance which could motivate the adoption of some degree of process relational governance. By leading to enhanced performance, process relational governance could subsequently increase the confidence in the relationship, thereby further elevating the levels of structural relational governance. In effect, we contend that in WB-CS relationships there would be a virtuous cycle through which these two aspects of relational governance will continuously enhance each other.

Finally, we provide nuanced insights into the effect of complexity on governance mechanisms by further proposing two different forms of complexity. Extant research broadly suggests that

increased complexity typically results in increased formalization (Anderson and Dekker, 2005; Mesquita and Brush, 2008; Roehrich and Lewis, 2014). Additionally, literature also suggests that increased complexity could also require the need to combine formalization with relational governance mechanisms (Chakkol et al., 2018; Roehrich and Lewis, 2014). While these conjectures are consistent in the case of the two polar types of sourcing complexity (i.e., overall low complexity and overall high complexity), we notice that they need not be true when looking at the different dimensions of complexity independently. Specifically, in the case of low and high levels of structural complexity, increasing complexity results in increased formalization alone. But in the case of low and high levels of process complexity, increasing complexity results in the adoption of relational governance and not formalization. This could be attributable to the fact that the difficulties (i.e., coordinating and safeguarding) resulting from structural complexity could be more easily accommodated by increasingly formalized contracts alone. On the other hand, the inability to predict and codify the difficulties (i.e., ambiguities in understanding the cause and effect relationships) resulting from increased process complexity could rather make increased formalization ineffective, hence unnecessary (Bijlsma-Frankema and Costa, 2005; Das and Teng, 2001), or excessively costly (Anderson and Dekker, 2005).

6.2 Managerial Implications

Our findings have important implications for Western companies working with suppliers in a recently developed economy like China. First, given the distinct effects of structural and process complexity on governance, we advise managers to account for the specific challenges brought forth by each of them. For example, firms that seek to exploit the benefits of integrated global sourcing – such as synergies involving economies of information, learning, process, and scale – should craft appropriate governance mechanisms to overcome the difficulties posed by the increased configurational complexity even when the sourcing process is relatively simple. Second, our result suggesting that relational governance might not be strictly necessary if the complexity of the sourcing process is relatively low has significant managerial implications due to the fact that the development

of effective relational mechanisms typically (1) requires a significant amount of time and effort, and (2) promotes an expectation of business continuity that might not be desirable when alternative suppliers exist and the switching costs are low. Finally, though combining all governance mechanisms can result in a great cost as well as effort for the buying firm, it is worthwhile as the resulting payoff will be substantial. This was clearly highlighted by TC wherein the managers consider the successful relationship with such a critical supplier to be a key determinant of competitive advantage. However, it is important that managers are aware of the managerial burdens brought forth by combined governance arrangements and circumscribe their use solely in cases of high process complexity and high structural complexity.

7. FUTURE RESEARCH DIRECTIONS AND CONCLUSIONS

We see opportunities to further develop the outcomes of our research effort. First, given the influence that the specificity of the Chinese socio-cultural context may have, it would be beneficial for future research to study additional settings (particularly, other emerging economies) in order to explore the impact of our key contingencies. Second, while we measured sourcing structural complexity through number of entities, geographical distance between the entities, and the geographical dispersion of the entities, this conceptualization could be restrictive. For example, we used the number of countries where subsidiaries are located as a measure of geographical dispersion. Future research could broaden the scope of sourcing structural complexity by including psychic distance (Dikova, 2009) which could include aspects such as political, cultural, and institutional differences. Third, in the case of high process complexity we found centralized control to persist despite the relatively long duration of the relationships. It would be interesting to examine whether this is in some way due to (1) the difficulty in transferring knowledge to the supplier, (2) supplier's weak absorptive capacities, or (3) the buyer's "a priori" belief that control remains necessary in this operating context. Fourth, although the use of the case study approach allows an increase in the quality and quantity of data obtained, it does come with limitations. Since the propositions developed are

based on a limited number (i.e., four) of cases, we recommend future research to test our propositions using a larger sample in order to increase their generalizability.

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Figure 1 – Selected cases

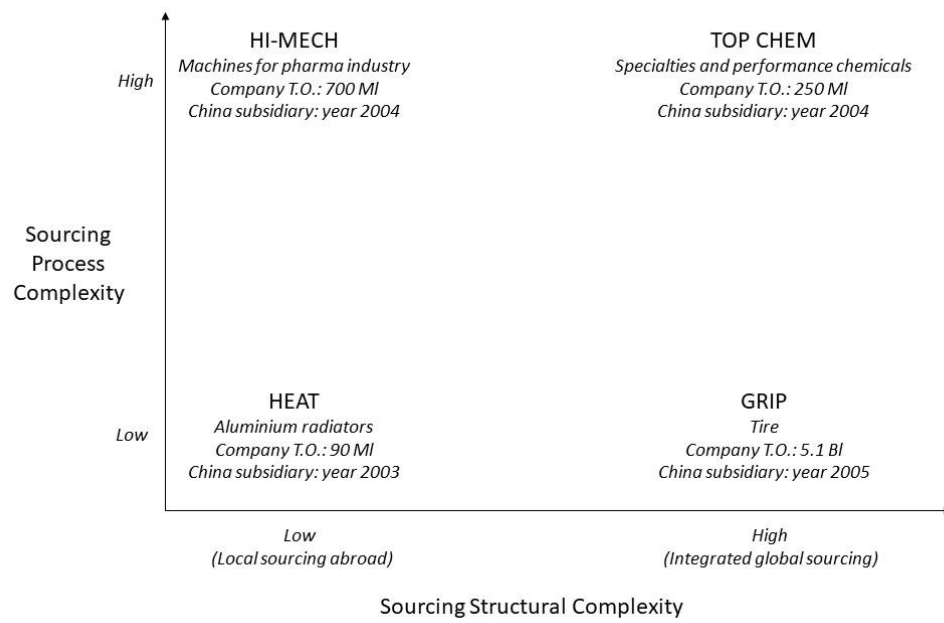


Table 1: Profiles of the informants and other data sources

Company (Industry)	Informant	Experience in China at the case company (yrs)	Nr. of interviews	Other data sources
Hi Mech (Automatic machines)	Subsidiary Top Executive	6	1	Company's presentations
	Subsidiary CPO	5 (2 as buyer)	4	
	Buyer in charge	3	3	
	Supplier Quality Manager	2	2	
	Corporate CPO	-	1	
Top Chem (Specialties and performance chemicals)	Subsidiary Top Executive	11	1	Company's presentations; General standard purchasing conditions; Vendor rating scores (confidential)
	Subsidiary CPO	4	3	
	Buyer in charge	3	4	
	Supplier Quality Manager	2	2	
	Corporate CPO	-	1	
Heat (Domestic heating radiators)	Subsidiary Top Executive	6	1	Company's presentations; Contract sample (without the economic figures)
	Subsidiary CPO	8	3	
	Buyer in charge	2	3	
	Supplier Quality Manager	3	1	
	Corporate CPO	-	1	
Grip (Tires)	Subsidiary Top Executive	10	1	Company's presentations; Vendor rating scores (confidential)
	Subsidiary CPO	7 (3 as buyer)	3	
	Buyer in charge	2	3	
	Supplier Quality Manager	3	1	
	Corporate CPO	3	1	

Table 2: Phases of data collection

Phase	No. of companies (and interviews)	Average Duration	Informants	Topics
1 – First trip to China	8 (22)*	1.5 hours	Subsidiary top executive; Subsidiary chief of purchasing operations (CPO)	Company's organizational characteristics, and activities and sourcing in China; General characteristics of 2-3 strategic purchasing categories; Sourcing structural complexity; Drivers of Sourcing process complexity
2 – Second trip to China	4 (12)	1.5 to 2.5 hours	Subsidiary CPO; buyer in charge; supplier quality managers	Validate our assessment of complexity; Supplier's organizational characteristics; Governance of the selected buyer-supplier relationship for the chosen purchasing category
3 – Interviews at the firms' HQ	4 (4)	0.5 to 1.5 hours	Corporate CPO	Corporate international sourcing strategy
4 – Further data integration (video-conference interviews)	4 (10)	1 to 2 hours	Subsidiary CPO and/or buyer in charge	Data integration for enhancing the understanding of the relationships, and for refinement of the findings

* of these 22 interviews, 8 were with companies that are not included in the final sample

Table 3: Case Details

Case	HI-MECH (HM)	TOP-CHEM (TC)	HEAT	GRIP
<i>Chinese subsidiary details</i>	Subsidiary opened in 2004 to produce entry-level machines for the Chinese and Western markets. Subsidiary's product range has been broadened in time. Asian markets: 50% of its turnover	TC pioneered the sourcing of yellow phosphorus in China (late '90s). Subsidiary opened in 2004 to produce additives for thermoplastics. Serves: Chinese and Far Eastern markets; Western markets for one product line. 50% of turnover from exports. Subsidiary issues its own purchase orders (HQ coordinates those of the European plants)	Subsidiary opened in 2003; now the company's primary producer of medium-range radiators. Russia is the first market; Chinese domestic market is growing rapidly	Subsidiary opened in 2005 to expand the company's sales within Mainland China and the Far East. The Chinese market: more than 50% of the subsidiary's turnover
<i>Purchasing category (supplier)</i>	Critical gears (supplier A)	Yellow phosphorus and derivatives (supplier B)	Aluminium alloy (supplier C)	Tire cord (supplier D)
<i>Relationship duration</i>	5 years	8 years	3 years	5 years
<i>Business with supplier (€)</i>	Approximately 1.5 MI	Approximately 2 MI	Approximately 2.5 MI	8-10 MI
<i>Sourcing structural complexity</i>	Low (Local sourcing abroad)	High (Integrated Global Sourcing - B supplies both the Chinese subsidiary as well as the Western plants)	Low (Local sourcing abroad)	High (Integrated Global Sourcing - HQ in charge of supplier selection, negotiation and control of vendors, and in conducting annual audits. D ships directly to GRIP's plants worldwide)
	Number of entities: 2 (Chinese subsidiary and Chinese supplier)	Number of entities: 6 (Chinese subsidiary, Chinese supplier, and four European plants)	Number of entities: 2 (Chinese subsidiary and Chinese supplier)	Number of entities: 7 (Chinese subsidiary, Chinese supplier, and several European and Asian plants)
	Number of countries spanned: 1	Number of countries spanned: 3	Number of countries spanned: 1	Number of countries spanned: 5
<i>Sourcing process complexity</i>	High	High	Low	Low
<i>Profiling complexity</i>	<i>High</i> - Highly specific requirements, uncommon to most Chinese suppliers: customized gears with unconventional shapes and characteristics (e.g., hardness and resistance to fatigue), can require up to 50 hrs of machining and cost over 1,000 euros each; high product variety	<i>High</i> - Many technical and environmental specifications, some of which are uncommon to the suppliers; communication issues due to suppliers' reluctance to ask clarifications	<i>Low</i> - Well-established product characteristics, complemented by some further, easy-to-specify customizations on chemical composition of the alloy (e.g., max allowance of certain impurities) affecting product performance (e.g., corrosion resistance)	<i>Low</i> - Well-established industry standards (e.g., mechanical properties; material of the tire yarns) remove ambiguities in performance specifications
<i>Selecting complexity</i>	<i>High</i> - Few suppliers available with adequate technical capabilities; suppliers' lack of interest towards low-volume business; uncertainty in a selection process based on supplier's potential (rather than the actual readiness to supply), and on <i>perceived</i> supplier's commitment to invest in the relationship	<i>High</i> - Highly heterogeneous supply market, with only a few suppliers owning appropriate equipment and process capabilities. Among the 100+ suppliers evaluated in past years, less than 10 either fit the expectations or showed the potential to achieve them	<i>Low</i> - Many suppliers available, even in the proximity of HEAT's plant	<i>Low</i> - China is the world's main market for tire cord. Although GRIP's high requirements on quality standards and ethical standards exclude a number of potential suppliers
<i>Negotiation complexity</i>	<i>High</i> - Customization of the production process and the need for ad hoc quality controls make exact quotations difficult raising the risk of frequent renegotiation requests	<i>High</i> - Need to rigorously define potential liabilities in case of accidents and to address several contingencies (e.g., variable custom duties, fluctuations in the raw material cost, etc)	<i>Low</i> - Aluminium price set at the domestic stock-exchange can be taken as the starting reference point for price bargaining, making negotiations easier	<i>Medium</i> - Some complexity arising on issues less familiar to the suppliers (e.g., CSR)
<i>Compliance complexity</i>	<i>High</i> - Complex task execution: defects can arise for several reasons, e.g.: errors in machine setting, lack of care in product handling, low quality of raw materials, etc.; subtle reasons of rejections raise risk of disputes	<i>High</i> - Possible quality and delivery issues driven by stringent and diversified product/process requirements	<i>Low</i> - Occasional, generally easy-to-fix, quality (e.g., incorrect chemical composition of the alloy) and delivery issues	<i>Low</i> - Not perceived to be complex except for occasional delivery issues

Table 3: Case Details (continued)

<i>Case</i>	HI-MECH (HM)	TOP-CHEM (TC)	HEAT	GRIP
<i>Structural transactional governance</i>	<i>Low</i> - Only basic order specifications, and agreement of a “price list” (Technical specifications are set on the drawings and can be integrated through verbal explanations under request)	<i>High</i> - Detailed contracts (6-12 months duration): include mechanisms for price adjustments (changes in raw materials, custom duties, etc.), quality and logistics specifications and penalties (logistics terms include specifications on the container’s characteristics), environmental and safety standards, and termination conditions	<i>Low</i> - Very simple contracts (Duration 1-3 months, include only basic terms, e.g.: price, quantity, delivery date)	<i>High</i> - Detailed contracts: includes price, duration (usually 1 year), currency hedging, volume projections, quality and logistics specifications, ethical code of conduct, penalties and termination terms
<i>Process transactional governance</i>	<i>High</i> – Complete quality checks of the delivered finished products; prescription of specific quality controls; intense yearly audit; frequent plant visits; order monitoring through visits and phone calls, and continuous solicitation in case of delay; selection of critical second tier suppliers	<i>High</i> – Prescription of quality controls, frequent visits, order monitoring, audit especially for environmental compliance; supplier B is requested to inform TC when a new supplier relationship (second tier supplier) is activated	<i>Medium</i> – Extensive preliminary audit of C’s production system (e.g., HEAT requests cascade system of ovens for better separation between heavy and light materials); Prescriptions on some characteristics of the supplier’s raw materials; Prescription of some (relatively standardized) quality controls (e.g., density; tests on the casting samples); third-party inspection of the supplier’s quality control equipment	<i>Low</i> – Random controls of delivered goods; use of scorecard; yearly audit. Neither prescriptions over supplier’s production process, nor controls over supplier’s supply base are adopted
<i>Structural relational governance</i>	<i>High</i> – Emphasis on long term orientation; constantly increasing business allocation to the supplier, and informal commitment to continue if supplier A achieves the targets; specific investments on equipment and tools	<i>High</i> – TC adopts long term orientation and it values the relationship; specific investments include process tools, process changes to ensure environmental compliance, and customized container	<i>Low</i> – Relationship is not considered more important than others; very modest dedicated investments	<i>Low</i> – Bidding is adopted for business assignments. No specific investments
<i>Process relational governance</i>	<i>High</i> – Free consultancy and intense supplier development (e.g. personnel training); exchange of economic information (cost break down); supplier’s personnel invited to visit the company’s plant; joint analysis of defects	<i>High</i> – Significant information exchanges; supplier training on process improvement and sustainability (advice on fumes filtration and water discharge treatment); TC runs lab test to help the supplier in fine tuning of customized phosphorus derivatives	<i>Low</i> – No significant information exchange (e.g., no exchange of information on volume budget or on cost-break down); little supplier development and only adopted at the beginning of the relationship (e.g., traceability of materials); reactive operational joint efforts when necessary	<i>Low</i> – Operational information sharing aimed to favour logistics efficiency (volumes; quarterly forecasts); no supplier development; no joint actions
<i>Operational and Relational Performance</i>	Supplier’s significant technical improvement over time; It is now capable to also produce quite complex components; remarkable reduction of scraps (by 50% last year)	Supplier has the highest delivery performance for the purchasing category; quality issues (e.g., excess of impurities) rare. Supplier compliant with environmental requirements	Supplier price is competitive; quality performance is satisfactory. The supplier is responsive (willing to speed up deliveries under request), and committed to resolve quality issues if they arise	Supplier has been able to keep good economic competitiveness, despite the volatility of raw material costs. Delivery performance generally good and reliable.
	Supplier is committed to the relationship; continuous development efforts. HM has confidence in the supplier’s goodwill (e.g., HM believes any defects that occur are not attributable to opportunistic conducts)	Supplier behaves in accordance with the contract norms; occasional disputes are managed in a friendly way. Efforts to accomplish TC’s requests under critical circumstances (e.g., urgent deliveries)	Supplier does not behave opportunistically and it respects the relationship and the buying company	Supplier behaves fairly. Requests for price increase are motivated in detail. Supplier’s understanding of contracts has increased in time

Appendix A

Drivers of complexity of different stages of the sourcing process

Sourcing Process Phase	General Definition	Drivers of Complexity
Profiling	Difficulty in defining as well as communicating the characteristics of the product and/or supply.	- Numerous requirements to be specified (Roehrich and Lewis, 2014; Trautmann et al., 2009) - Product variety (Salvador et al., 2002) - Specification of product and/or supply requirements is challenging and requires expertise (Trautmann et al., 2009) - Bespoke, highly customized requirements (Roehrich and Lewis, 2014) - Novelty of the purchase; changing requirements (Trautmann et al., 2009; van Weele, 2004) - Non-existence of widely accepted industry standards pertaining to product/process (Trautmann et al., 2009)
Selecting	Difficulty in finding, comparing, and selecting suppliers.	- Limited availability of suppliers (Trautmann et al 2009; Kraljic, 1983) - Heterogeneity of supply market (Trautmann et al., 2009) - Limited availability of alternative technology or material (Kraljic, 1983) - Degree of supplier readiness with respect to capability requirements (Subramanian et al., 2015) - Limited availability of production capacity (Gualandris and Kalchschmidt, 2015)
Negotiation	Difficulty and time taken to agree on the conditions of the exchange, perception of a high risk of renegotiation request.	- Numerous requirements to be specified (Roehrich and Lewis, 2014; Trautmann et al., 2009) - Limited availability of capable suppliers (Trautmann et al., 2009; Kraljic, 1983) - Challenging and stringent product/process requirements (Trautmann et al., 2009) - Customization of the product and the production processes (Roehrich and Lewis, 2014; Trautmann et al., 2009) - Novelty of the purchase (Trautmann et al., 2009; van Weele, 2004) - Limited availability of production capacity (Gualandris and Kalchschmidt, 2015)
Compliance	Difficulty of planning the activities spanning from order issuance to order delivery as well as to ensure appropriate supplier performance.	- Numerous requirements to be specified (Roehrich and Lewis, 2014; Trautmann et al., 2009) - Product variety (Salvador et al., 2002) - Demand volatility (Gualandris and Kalchschmidt, 2015 (Trautmann et al., 2009) - Challenging and stringent product and production/delivery requirements (Trautmann et al., 2009) - Lack of reliability of the transportation system (Fawcett and Closs, 1993; Subramanian et al., 2015)

Appendix B

Interview protocol

GENERAL INFORMATION

- Provide a general description of the company's activities in China, and how they have evolved over time
- What are the main objectives and motivations for your presence in China?
- Describe the range and types of products you produce in the Chinese plant, and the markets it supplies
- Provide a description of the organization of the company's purchasing department in China
- What is your general evaluation of your sourcing activity in China?
- Please consider 2-3 main products ("strategic purchasing categories") your company buys in China (select them on the basis of the magnitude of the overall business involved and/or the impact of the purchased component on the finished product's value and performance). Briefly describe the sourcing mode (e.g.: single sourcing; dual/parallel sourcing; multiple sourcing) you adopted, the characteristics of the Chinese supply market, and the main characteristics of the Chinese suppliers (Ownership structure: Chinese Private Enterprise; Foreign Invested Enterprise; WOFE – Size – Location – Market position)
- Provide the following information with respect to these 2-3 strategic purchasing categories:
 - o information regarding product categories
 - o high-performing autochthonous supplier relationships (if any)
 - o Select one such high-performing relationship and discuss the following:
 - Generally speaking, what is your perception about the effectiveness of the relationship?
 - Which are the main aspects of satisfaction?
 - Does this supplier act in an opportunistic manner?
 - How does this supplier perform across different metrics?

CONTINGENCIES

For the purchasing category selected, we will analyze the following issues:

Sourcing Strategy

- Which of the following sourcing strategy does your company adopt in China?
 - A. we buy in China only for the needs of the Chinese subsidiary
 - B. we buy in China for both the local subsidiary and the rest of the group (e.g., other subsidiaries, or even the entire group)
- What are the reasons that drive your sourcing strategy in China?
- What is the degree of autonomy of the Chinese purchasing unit in:
 - A. supplier audit, validation, selection;
 - B. supplier relationship management: settings/negotiation of the exchange terms; selection of the governance mechanisms in the relationship (control-monitoring mechanisms; contracts; relational practices)

Sourcing Complexity

Product Characteristics

- Describe the product characteristics including aspects such as number of parts, strict tolerances; complex shapes and assembly, etc.
- Are product specifications relatively standardized or are they significantly customized or even unique?

- In specifying the technical and functional requirements of the product, do you require a significant number of interactions among different company's departments (e.g., R&D, production, purchasing, quality, etc.)? Do you need to involve the supplier too?
- Are these requirements stable or do you change them (relatively) frequently?
- Are customer requirements and specifications difficult to communicate?
- Are special requirements (e.g. for safety and environmental compliance) required?
- Are quality issues/defects easily detectable? How difficult is to resolve them?
- Describe the production process required to make this product (you could think in terms of technological complexity, innovativeness, labour force requirements, quality requirements, etc.).

Purchasing Situation

- How difficult is it for you to find suitable suppliers? How many suppliers are there with the technical/process/management capabilities you require?
- Are suppliers' characteristics relatively homogeneous and comparable for this product category, or do suppliers tend to differ?
- Do new suppliers emerge (relatively) frequently, or is it rare?
- What is the degree of suppliers' readiness?
- Are suppliers usually interested/willing to work with you?
- Are objectives, terms of the exchange, and evaluation criteria difficult to define and agree? Why? What are the main criticalities in that?
- For this product category, are there frequent requests for change/renegotiation?
- What is the degree of demand variability for this product? Do you tend to change orders/delivery plans frequently?
- Is logistics/transportation complex for this product (e.g.: dangerous/highly risky transportation; risks of damaging the product in transportation; need of specific, expensive envelops; etc.)? Are logistics issues frequent/relevant?
- How serious is the risk of sudden supply interruption (due to, e.g., external factors like Government instructions, supplier failure, or even its voluntary decision to drop out of the relationship)?

GOVERNANCE

For the purchasing category and the supplier relationship selected, we will analyse the following issues:

- Do you use an explicit formal contract to manage the relationship? In case you do, please describe the degree of completeness of the contract and the main contract terms (e.g.: economic terms, including agreement of annual discounts, volume effects, management of currency exchanges and raw material cost variations; duration of the relationship; main general standard purchasing conditions; quality and logistics terms and penalties)
- Please describe the main mechanisms of control and monitoring you adopt in managing this supplier relationship. Forms of control and monitoring might include, but not limited to, the following ones:

Vertical control
Tech drawing specifications
Phases of the production process (sequence of the operations; indications on how to execute the specific operations; indications of the necessary equipment)
Production planning and inventory management
Phases of quality control
Supplier's supplier selection

Monitoring
Preliminary audit
Monitoring of supplier's certifications
Direct monitoring of the production process
Monitoring of supplier's raw materials and inventory levels
Control of supplier's finished product
Monitoring of order's status

- Do you adopt the following practices of relationship management? If yes, please provide examples and make a statement of their intensity:
 - a. specific investments (e.g., physical assets like tools, machines, assembly lines, etc; HR specialization; plant location)
 - b. long-term relationship orientation
 - c. information exchange (strategic; economic – e.g. cost breakdown; technical; operational)
 - d. joint actions (e.g., collaborative effort in problem solving – flexible adjustments – joint initiatives for cost reduction, quality increase, quality improvement; logistics optimization – cordial resolution of disputes, etc.)
 - e. efforts of supplier development initiatives (direct – indirect). Please specify the amount of resources employed in the effort

Appendix C

Key variables and representative quotes

Sourcing complexity [value]	Representative Quotes	Governance mechanisms [value]	Representative Quotes
Structural complexity [low]	“Transportation costs of bulky, heavy ingots reduce the interest of buying here for the entire group” (Corporate CPO, HEAT) “In China, we only buy gears for the local needs” (Subsidiary CPO, HM)	Structural transactional [low]	“We use simple, short-term purchasing agreements (1-3 months) that only include details on price, volume, delivery terms and few general purchasing conditions” (Subsidiary CPO, HEAT) “Short-term purchasing orders suit our production model well. There is no great uncertainty in these deals. If a supplier does not comply to our expectations, or it creates us problems, we simply prefer to dismiss the relationship, rather than entering into a litigation” (Buyer in charge, HEAT) “In light of the complexity and variety of our product, we regularly experience difficulty in conveying our requirements to the supplier. If an unexpected issue arises, sometimes we still wonder whether we had missed something in explaining our need to the supplier. In addition, there are aspects that cannot be precisely specified a priori: certain quality controls started to be requested in response to repeated failures of the supplier, that were not foreseen. In effect, writing quite detailed contractual specifications would require a lot of effort, along with a risk that the contract could prove impractical in day-to-day use” (Buyer in charge, HM)

Structural complexity [high]	“Practically, a European supply market of yellow phosphorous does not exist any more. We buy yellow phosphorous mostly from China and Kazakhstan. But China is our main supply market because Kazakhstan has a smaller supply market and a less developed logistics infrastructure. In addition, Kazakhstan is not bordered by an open ocean connecting other continents; this further complicates the transportation of yellow phosphorous” (Corporate CPO, TC) “China is the world’s main supply market for tire cord. It offers good opportunities in terms of both capacity availability and price competitiveness. We buy in China most of the group’s overall volumes of tire cord” (Corporate CPO, GRIP)	Structural transactional [high]	“Contracts are important to provide some levels of legal coverage, especially in case of serious accidents, that is required by the European plants” (Corporate CPO, TC) “The economic damage of, e.g., a product recall due to a supplier’s defective lot would be much higher in a global supply chain because (a) the order size is generally bigger when you buy for many plants, and (b) managing the recall logistics is much more complicated and expensive. So, the contract ensures that the supplier is accountable” (Subsidiary CPO, GRIP) “Drafting general rules through a formal contract is also useful to harmonize the company’s behaviour and expectations. It is useful to ‘make our company speak with one voice’. For e.g., take the case of ethical issues. Different plants (subsidiaries) may have different sensibilities towards such issues and this could result in diversified emphasis on supplier’s CSR if they are allowed to manage the supplier autonomously. Instead, since the ethical code is part of the contract, the supplier has to comply with our corporate rules” (Subsidiary Top Executive, GRIP)
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Process complexity [low]	“Quality compliance of aluminium ingots essentially consists of ensuring the desired chemical composition and physical properties that are specified by certain ranges and tolerances. It is a relatively standardized procedure for the supplier to perform” (Supplier Quality Manager, HEAT) “Finding suppliers is not difficult here in China. I receive new proposals from firms that would like to enter our supply base almost every week” (Buyer in charge, GRIP)	Process transactional [moderate]	“The initial audit is certainly the most important, and form of direct control over the supplier. We use that occasion to ensure that the production process of the supplier is adequate and compliant with our requirements. After this initial audit, direct visits are sporadic in the case of supplier C” (Subsidiary CPO, HEAT)
		Process transactional [low]	“Controls on deliveries are on random basis. We see no need for more intense controls” (Buyer in charge, GRIP)
		Structural relational [low]	“We use different suppliers to exploit price competition between them” (Subsidiary Top Executive, HEAT)
		Process relational [low]	“From a technical point of view, supplier D has enough competence on its production and quality control processes. Therefore, supplier development activities were not necessary” (Supplier Quality Manager, GRIP)
Process complexity [high]	“Negotiations are definitely not easy for our purchases. First, we learnt that it is not uncommon for Chinese suppliers to restart the negotiation any time a purchasing order is issues. Besides, the product we buy is actually complex. This makes precise quotations more difficult, enhancing the risk that renegotiations will be required” (Subsidiary CPO, HM) “(At some point) We realized that we could barely find a supplier that is ready to fit our needs. This led us to change our approach and rather consider if a supplier had the potentiality to reach the performance level we expected. For example, we started to look for suppliers with a younger workforce that is reasonably skilled in IT, since we assumed they could have higher chances to learn how to program a CNC machine for our specific requirements. We also checked whether the supplier had some familiarity in dealing with small volume-high variety businesses. Naturally, there is higher uncertainty in this approach to selecting suppliers” (Buyer in charge, HM) “One difficulty we encountered in transmitting our requirements and (sometimes complex) product specifications is that they are	Process transactional [high]	“We chose and directly controlled some of the key tier 2 suppliers. We acknowledged it would have been difficult for Supplier A to take a primary contractor responsibility in such cases” (Buyer in charge, HM) “One thing we learnt about sourcing in China is the importance of mastering the details far beyond what we usually do in our domestic sourcing. Take the case of steel supply. In domestic sourcing, we don’t ask our suppliers to perform any particular control on the stainless steel they buy from certified (tier2) suppliers. But in China, our supplier encountered cases of “stainless” steel with significant degrees of impurities, and even a couple of instances of radioactive contamination of the steel. Fortunately, we had set up controls even against this risk. But we then asked our supplier to introduce this control as well in its own process and to inform us about its steel sources” (Buyer in charge, HM)
		Process transactional [high]	“It is important that we visit the supplier’s plant frequently so as to ensure that critical parts of their production plant frequently – particularly the filters and the mixing chamber – are cleaned frequently” (Supplier Quality Manager, TC)

	often hesitant to ask clarifications if there is something they do not comprehend. I learnt that this is an aspect of the Chinese culture called '<i>mianzi</i>' (i.e., face/image/honour): essentially, the fear of '<i>mianzi-loss</i>' prevents them from admitting the lack of understanding. Simply because they respond "Yes" when they are asked whether they understood doesn't mean that it is really the case" (Subsidiary CPO, TC) "Our product requires minimal levels of impurities since these could degrade the performance of our phosphorus-based additives that needs to work under high stress operating conditions (e.g., high temperature)" (Supplier Quality Manager, TC)	Structural relational [high]	"Supplier B had to adopt particular mixing and grinding tools in its production process in order to fulfil our needs. We split their cost with supplier B" (Subsidiary CPO, TC)
		Process relational [high]	"Conducting joint analysis of defects with supplier A is of paramount importance. In fact, without our guidance, it might be difficult for the supplier to understand why we have to reject a piece due to a one-tenth-of-a-millimeter imperfection in the curvature of a paraboloid. In these occasions, we can explain that such a minimal imperfection will lead issues such as a wrong dosage in the preparation of a drug, and, this would eventually make it useless for our customer" (Supplier Quality Manager, HM) "To keep the Chinese suppliers committed, it is important to give them constant messages that our relationship is valuable to them... to sell the idea that it offers great business opportunities for them... As a matter of fact, since their domestic market is growing rapidly, it would be relatively easy for the supplier to find new customers. For example, when we activated a new production line with brand new machineries in our Chinese plant a few months ago, we immediately invited Supplier B to visit the product line. It was a way to convey the message that our business was increasing. Things like this really matter when dealing with Chinese companies" (Buyer in charge, TC)

AUTHORS' BIOGRAPHIES

Paolo Barbieri, Ph.D, is Associate Professor of Management Engineering at the Department of Management of the University of Bologna. His research interests are on buyer-supplier relationships, supply chain strategy, and manufacturing location and global supply chain configuration. He has published on several leading journals in the OM and SCM field, including: *Journal of Operations Management*, *Omega – The International Journal of Management Science*, *International Journal of Operations and Production Management*, *Journal of Purchasing and Supply Management*, *European Business Review*, *Operations Management Research*, and others.

Antony Paulraj is the Li Dak Sum Chair Professor in Information Systems and Operations Management at the Nottingham University Business School, Ningbo, China. His research interests are within operations management, supply chain management, strategic sourcing, sustainable supply chains and supply chain innovation. He has published research articles in journals including *Journal of Operations Management*, *Research Policy*, *International Journal of Operations and Production Management*, *Journal of Supply Chain Management*, *Journal of Business Logistics*, *International Journal of Production Research*, *Journal of Business Ethics*, among others.

Reham Eltantawy is the Coggin Endowed Strategic Professor, Professor of Marketing, and Chair of the Department of Marketing and Logistics at the University of North Florida. Her areas of focus are Strategic Sourcing, and Purchasing and Supply Management.

Giorgio Prodi is Associate Professor in Applied Economics at Ferrara University, department of Management and Economics. His research interests are within Industrial Organization and Chinese Economy. He has published research articles in journals as the *Cambridge Journal of Economics*, *Environment and Planning C*, *Journal of Evolutionary Economy*, *Scientific Reports*. He also wrote books on the presence of Italian companies in China.