Control, innovation and international joint venture performance: The moderating role of internal and external environments

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Abstract

This study aims to analyze how parent control strategies affect the degree of innovation in international joint ventures (IJVs) and how different types of innovation strategies - divided into radical and incremental innovation strategies - influence the performance of IJVs. This study uses the most widely adopted definition and operationalization of control in IJVs by Geringer and Hebert (1989), including the three dimensions: mechanisms, focus, and extent of control. These relationships are further analyzed by integrating internal and external moderating factors and their connections with IJV performance. Our theoretical analysis proposes that various control strategies differently influence an IJV's innovation activities under various internal environmental moderating factors. These, in turn, differently influence the IJV performance. Furthermore, we suggest that the external environmental factors moderate the relationship between innovation strategies and performance of IJVs.

Keywords: Control strategies, incremental and radical innovation, performance, international joint ventures

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1. Introduction

International Alliances (IAs) are collaborative agreements involving multiple business organizations located in different countries (Lojacono et al., 2017). Firms establish IAs abroad to achieve a variety of goals and objectives such as entering new markets, exploiting learning opportunities, and joining forces with local partners in research and development and innovation (Inkpen, 2008; Mahmood & Zheng, 2009; Bidault, 2012; Ghauri et al., 2013). IAs can be broadly divided into two types: equity (e.g. International Joint Ventures: IJVs) and non-equity alliances (Reuer & Devarakonda, 2016). These two governance modes of IAs differ in several aspects. Previous research shows that equity alliances such as equity IJVs provide partners with more control than non-equity alliances (Reuer et al., 2014). Through employing arrangement systems, partners of equity IJVs are able to exercise their control rights (Hennart, 1988) and this allows them more voting power (Blodgett, 1991). Reuer et al. (2014) and Lojacono et al. (2017) note that while an equity IJV as a separate entity maintains a high degree of managerial independence through a board of directors, a non-equity alliance lacks its own dedicated management. Furthermore, Choi and Contractor (2016) argue that the degree of overall integration in equity IJVs is higher than in non-equity alliances.

According to Brenner and Ambos (2013), the control and coordination of geographically and culturally dispersed subsidiaries is one of the most prominent challenges in international management. Previous research (e.g., Inkpen & Currall, 2004; Luo, 2007) has shown that parent control strategies have a direct influence on the learning environment (Makhija & Ganesh, 1997) and therefore the strategy selected may either stimulate or reduce innovation activities (Bates & Khasawneh, 2005; Fang, 2011; Labitzke et al., 2014), firms' capabilities (Trąpczyński & Gorynia, 2017), and performance (Park et al., 2015; Shah, 2015; Mantecon et al., 2016; Trąpczyński & Gorynia, 2017) in IAs. Gomes et al. (2016) have reviewed more than 800 articles published in 22 leading journals during a 22-years period, maintaining that factors affecting the operation of alliances, control, and performance have been the key topics in alliance research during the reviewed period. Recently, Paredes-Frigolett and Pyka (2017), Zach and Hill (2017) and Li et al.

(2018) have argued that our knowledge of innovation in networks and strategic alliances is still limited. To further extend this important stream of research (Geringer & Hebert, 1989; Lu & Hebert, 2005; Luo, 2007; Larimo & Nguyen, 2015; Shah, 2015; Nguyen et al., 2016a), our study aims to establish the relationship between control strategies and innovation activities and between innovation types and IJV performance. More specifically, this study aims to answer the following research questions: 1) **How do parent control strategies influence innovation activities to take place in IJVs?** 2) **What is the relationship between innovation strategies and performance of IJVs? and 3) How do internal and external business environments moderate these relationships?** As innovation activities are often related to research and development and they require firms to invest their equity resources, we thus focus on the context of equity (vs. non-equity) joint ventures in this study.

We analyze the influence of parent control strategies and innovation strategy on IJV performance, because innovation is related to competitiveness and is an important indicator of venture performance of parent firms (Labitzke et al., 2014; Santos et al., 2014). We further expect that the associations between parent control strategies and innovation activities are moderated by internal environmental factors. Furthermore, we expect that innovation strategy, divided into incremental versus radical innovation, leads to different levels of performance under moderating effects of external business environments. We follow the definition and operationalization of parent control in IJVs by Geringer and Hebert (1989) in their JIBS Decade Award winning article. They divide parent control strategies into three dimensions: mechanisms, focus, and extent of control. Furthermore, we focus on IJVs that have only two partners and on the viewpoint of the partners who have majority or 50/50 ownership in the IJV so that they have a voice in the control strategies of the IJV. The framework of the study is presented in Figure 1.

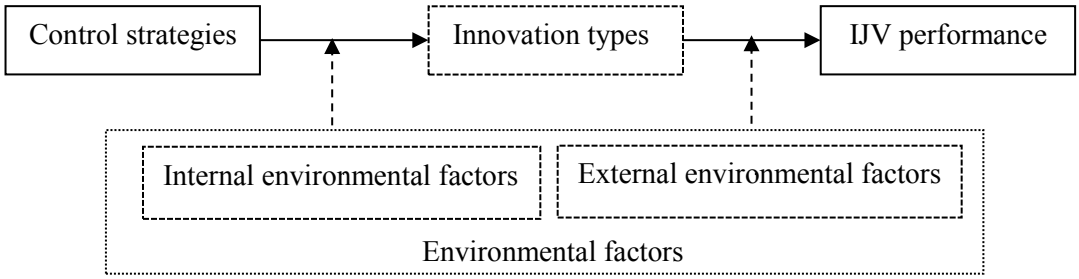


Figure 1: Framework of the study

Our study makes three contributions. First, related to IJV control, we extend the existing literature as earlier studies have included only one of the three control dimensions, such as control focus in Tiwana (2008) and mechanism in Lawson et al. (2009) in their studies of the relationship between control strategies and the degree of innovation. To our knowledge this is the first study to establish the relationships using all three dimensions of parent control strategies. We further contribute to the existing IJV literature by analyzing how the relationship between control strategies and types of innovation is moderated by the internal environment of IJVs. Second, we analyze a key issue faced by most multinational enterprises (MNEs): performance of their IJVs. Previous studies have established the relationship between control strategies and performance of IJVs (e.g. Luo et al., 2001; Stouthuysen et al., 2017), but the underlying mechanisms through which control influences performance have still received limited attention. We establish linkages between types of control, innovation strategies, and performance of IJVs under moderating effects of external business environments. Third, as innovation strategies may exert influence on performance (Labitzke et al., 2014), our study indicates the importance of selecting the right innovation strategy for better IJV performance in different business environments.

The rest of the paper is organized as follows. In section two, we review prior literature related to parent control strategies, innovations, and the role of environmental factors in the context of IJVs. In section three, we develop our research propositions. Finally, section four will present the conceptual model and discuss contributions, limitations, and implications for further research.

2. Literature review

2.1. Parent control

According to control theory (e.g. Brenner & Ambos, 2013; Harzing, 1999), MNEs employ various control dimensions to coordinate units worldwide in order to meet global organizational objectives. Parent control is defined as the process by which an organization influences its members and units to work in ways that meet organizational objectives (Glaister & Buckley, 1998). In the context of IJVs, parent control refers to the influence exerted by partners over an IJV's operational activities (Geringer & Hebert, 1989). According to Geringer and Hebert (1989), IJV control consists of three dimensions: *mechanisms*, *focus*, and *extent*. Although there are also several other views about dimensions of control (e.g. Luo et al., 2001; Yan & Gray, 2001), we apply the dimensions first

presented by Geringer and Hebert (1989) because these have been applied widely in later IJV control related studies.

Control mechanisms consist of formal and social controls that are available to parent firms to protect their interests in IJVs (Groot & Merchant, 2000; Fryxell et al., 2002). The formal control includes mechanisms such as hierarchies, standards, rules, procedures, goals, and regulations (Das & Teng, 1998). Formal control relies on contracts which introduce roles and responsibilities of the partners (Li et al., 2010). Formal control mechanisms help to decrease the potential for opportunism by controlling the assets through hierarchical means (Mjoen & Tallman, 1997). In addition, formal control is used to evaluate a partner's performance in relation to the specified output targets (Stouthuysen et al., 2017). On the other hand, social control is designed to promote mutual commitments through which IJV managers learn to share common attitudes and knowledge of the organization (Nonaka & Takeuchi, 1995; Dekker, 2004). Social control includes mechanisms such as informal communication, information exchange, mentoring, expatriate training, and development of a common organizational culture (Das & Teng, 1998; Chalos & O'Connor, 2004).

Control extent refers to the degree to which a parent exercises control over an IJV (Geringer & Hebert, 1989). In other words, control extent is related to how much control power the parent firm has used to align its IJV (Puck et al., 2016). Partners can choose to have a broad control focus so that they can exercise control over the entire range of the IJV's activities. On the other hand, IJV partners can exercise narrow control which confines their control activities to the most important performance dimensions (Geringer & Hebert, 1989; Groot & Merchant, 2000).

Control focus refers to the scope of the activities over which the parents exercise control. It consists of process or result control focus. Process control mechanisms consist of standard procedures, formalized rules and routines, specified individual roles, and rigorous approval processes (Groot & Merchant, 2000). In process control, firms measure the behavior of their employees when they perform their tasks to ensure that the process is appropriate (Das & Teng, 2001). Process control directly regulates the activities of IJV operations (Chen et al., 2009). Process control can cause distress to the members of IJVs since they must deal with rules, procedures, and report to parent firms on a regular basis. On the other hand, result control is designed mainly to measure the outputs

in a precise and objective manner. Based on the achievements of members, parent firms use rewards or punishments accordingly (Das & Teng, 2001; Chen et al., 2009).

2.2. Innovation and the influence of environmental factors in IJVs

Innovation is a core issue in management studies. It is regarded as the generation of a new idea and its implementation in a new product, service or process (Chiva et al., 2014; Tabeau et al., 2017). The *Oslo Manual* (OECD, 2005) identified four types of innovations from the perspective of the firm: product, process, marketing, and organizational innovation. Product innovations refer to changes in capabilities of goods or services. Process innovations represent changes in production or delivery methods. Marketing and organizational innovations involve implementations of new marketing and organizational methods. These four types of innovation all have different degrees of newness, and therefore, all could be either incremental or radical innovation. These four types of innovation all have different degrees of newness, and therefore, all could be either incremental or radical innovation (Chiva et al., 2014).

Several researchers have argued that the operating environment of the firm is crucial for innovations (Tang, 1998; Jean et al., 2016). Previous research (e.g. Li et al., 2009) has pointed out that external environmental characteristics have a strong impact on control, collaboration, and productivity of IJVs. Firms that emphasize innovation tend to utilize their capability to respond to external environmental changes (Teece, 2007). However, to be able to build capability to deal with external environmental changes, firms - or in our case IJVs - must have a supportive internal environment to allow IJV members to put their ideas into practice and which fosters creativity during the innovation process to fit with the external environment (Bouwen & Fry, 1991). Li et al. (2009) have specified that in the internal environment of IJVs, appropriate control can encourage knowledge transfer and increase greater value creation, while collaborative behavior can encourage combining knowledge and thus lead to greater value creation. In such an environment, members of IJVs will be able to meet the needs of external environments, such as existing or emerging customers and markets, and transform these needs into new products and services (Jansen et al., 2006).

2.3. Method and process of literature review

In our literature review process, we concentrated on studies that have been published in well-established journals in the field of business and management, and they should have been included in the ranking of Association of Business Schools (ABS) at level 3, 4, 4+; the journals reviewed are Academy of Management Journal (AMJ), Administrative Science Quarterly (ASQ), Asia Pacific Journal of Management (APJM), British Journal of Management (BJM), International Business Review (IBR), Journal of Business Research (JBR), Journal of International Business Studies (JIBS), Journal of Management Studies (JMS), Journal of World Business (JWB), Management International Review (MIR), Management Science (MS), Organization Science (OS), Strategic Management Journal (SMJ), etc. The reason for focusing on articles published in these journals is that they are the most read and most cited, and therefore, they reflect the key knowledge development in this field.

The articles were selected through a systematic search method (Canabal & White, 2008; Dikova & Brouthers, 2016; Rosado-Serrano et al., 2018). They were identified through online databases such as EBSCO, ProQuest, Google Scholar, Scopus as well as articles' reference lists. We identified relevant articles through these databases using the keywords: "international joint ventures/international strategic alliances", "joint ventures", "control", "innovation", and "performance". For each article found, we reviewed its focus, theoretical base, methodology, findings, and suggestions for future research. After reviewing these articles, we further checked how control and innovation were defined and how authors have categorized innovation types. We then reviewed the relationship between control and innovation and between innovation and performance of IJVs in these articles. In total, we identified 94 relevant studies**.** Most of the reviewed studies were published during the period of 2000-2018. These articles were published in 25 different journals. SMJ (17), IBR (10), JBR (10), and AMJ (8) were the most common publication outlets, followed by JIBS (6), OS (6), APJM (5), JMS (4), MIR (4), MS (4), ASQ (3), BJM (3), JWB (2), and the rest published in other 12 journals (one article/journal).

From the 94 previous studies found, 33 studies were selected as the most relevant to our study because they contain discussions of: 1) innovation activities/types, 2) control strategies of parent firms, 3) performance of the units, and/or 4) IJVs/alliances. Further, these articles were published in established journals. The key features and findings of those studies are summarized in Table 1.

Studies	Innovation types	Focus	Methods	Findings
Damanpour & Evan (1984)	Technical and administrative innovation	The effect of adaptation of types of innovation on performance	Survey of 85 public libraries	Technical innovations occur at a faster rate than administrative innovations and are more important for performance of firms
Hitt, Hoskisson, & Kim (1997)	Firm innovation proxied by R&D intensity	The relationship between international diversification and firm innovation	295 manufacturing firms had average sales exceeding USD 100 million between 1988 and 1990	International diversification is positively related to firm innovation. Product diversification negatively moderates the relationship between international diversification and firm innovation
Chandy & Tellis (1998)	Radical innovation	To study why some firms are more successful at introducing radical product innovations than others	Survey of 192 senior managers in computer, telecommunication, photonic industry	Key variable that differentiates firms with strong radical product innovation records from others is the firms' willingness to cannibalize their own investments
Li & Atuahene-Gima (2001)	Product innovation	The moderating effect of environmental factors on the relationship between product innovation and performance of ventures	Survey of 184 new technology ventures in the Beijing Experimental Zone	The innovation-performance link was positively moderated by environmental factors such as institutional supports and environmental turbulence, but negatively moderated by strategic alliance for product development
Danneels (2002)	Product innovation	To study how product innovation influences renewal of firms	Qualitative study with 5 case companies	Product innovation serves as means to develop firm renewal over time
Allred & Swan (2004)	R & D intensity	To examine the relationship between national culture and innovation	Secondary data from 536 firms across ten countries	Individualism, low power distance, and low uncertainty avoidance are more positively related to innovation within multi-domestic industry, while Confucianism is more positively related to innovation within global industries
Subrahmanya (2005)	Radical and incremental product innovation	Internal and external factors that influence radical and incremental innovation in SMEs	Survey of 34 SMEs from Northeast of England and 34 SMEs from Bangalore in engineering industry	Internal factors (e.g., technical backgrounds of employees) support radical innovation, while external factors support incremental innovation
Jansen, Van Den Bosch, & Volberda (2006)	Exploratory and exploitative innovation	The impact of formal and informal coordination on performance and the moderating effect of business environment	Quantitative study with survey of 363 organizational unit managers in banking industry in Europe	Centralization negatively affects exploratory innovation, whereas formalization positively influences exploitative innovation. Environments moderate coordination mechanisms-financial performance relationship
Capaldo	Innovation	To investigate the	Case studies of three firms	Network structure: weak ties, strong

(2007)	capability	relational capability of three lead firms to sustain their innovation over time		ties, and dual network have different impact om innovation activities
Sampson (2007)	Innovation performance	The impact of partner technological capability diversity and organizational form on innovation performance	A sample of 463 R&D alliances in the telecommunications equipment industry	Moderate level of partner technological capability diversity is positively associated with the innovation performance
Luo & Deng (2009)	Innovation in knowledge-intensive industries	The impact of partner similarity on innovation and moderating effect of firm age and industry norms of collaboration	176 biotechnology firms between 1988-1999	There is an inverted U-shape relationship between partner similarity and innovation. The moderating effect of firm age and industry norms of collaboration on the relationship between partner similarity and innovation is positive
Nielsen & Nielsen (2009)	Product and process innovation	The impact of partner characteristic, knowledge characteristic, and trust on innovation	A sample of 120 Danish international strategic alliances formed during the period of 1985-2001	Inter-firm learning, tacit knowledge, and knowledge protectiveness increase innovation. Trust positively moderates the relationship between tacit knowledge and innovation
Jimenez-Jimenez & Sanz-Valle (2011)	Product, process, and administrative innovation	The relationship between organizational learning, innovation, and performance and effect of environment	Survey of 451 firms operating in Southeast region of Spain	The positive relationship between innovation and performance is stronger when firms are bigger, older and belong to manufacturing sector, but is less strong when the firm operates in an uncertain environment
Fang (2011)	New product innovation	The relationship of strategic alliance knowledge complementarity on new product innovation	Survey with 171 top managers of Chinese IAs in high-tech industries in China	New product development process interdependence and environmental dynamism positively moderate the effect of knowledge complementarity on new product innovativeness
Fang, Fang, Chou, Yang, & Tsai (2011)	Exploitative and exploratory innovation	Relationship between learning and innovation	Survey of with 161senior managers of Taiwanese high-tech firms	Information sharing and joint sense making indirectly influence both explorative and exploitative innovation through their effects on relationship-specific memory
Gunday, Ulusoy, Kilic, & Alpkan (2011)	Organizational process, production, and marketing innovation	Relationship between different types of innovation and performance	Survey of 184 manufacturing firms In Turkey	There is a positive effect of innovation on firm performance in manufacturing industries

Hess & Rothaermel (2011)	Innovation activities	To examine if resource complementary in alliances leads to better innovation activities	Secondary data of 2041 upstream alliances and 1061 downstream alliances	Interaction between star scientists and downstream alliances increases innovation performance but it decreases the interaction between upstream alliance and star scientists
Joshi & Nerkar (2011)	Number of patents	To study the effect of patent pools on firm performance in innovation	Secondary data from 874 patents and 679 firms	Patent pools inhibit rather than enhance systematic innovation by participating firms
Sanz-Valle, Naranjo-Valencia, Jiménez-Jiménez, & Perez-Caballero (2011)	Technical innovation	The relationship between organizational learning and technical innovation	Survey with 451 CEOs of Spanish firms in the Southeast of the country	Organizational learning is positively associated with technical innovation, and organizational culture can have both positive and negative impact on organizational innovation
Castaner, Mulotte, Garrette, Dussauge (2014)	Product innovation	To examine the impact of governance mode and fit on innovation performance	Secondary data of 129 firms with 334 product innovations	Governance fit plays a more important role for product innovation than governance mode
Azar & Drogendijk (2014)	Product, process, managerial, marketing	Relationship of psychic distance between home and host market and firm's propensity to innovate	Structural equation model using data from 186 export ventures into 23 international markets by Swedish firms	The link between psychic distance and firm performance is mediated by innovation
Chen, Li, Shapiro, & Zhang (2014)	Product innovation	Relationship between ownership structure and innovation	Panel data set of 487 and 475 Chinese listed firms during 2004-2005 and 2005-2006 respectively	Ownership type diversity improves innovation performance
Lodh, Nandy, & Chen (2014)	Product innovation	Relationship between innovation and ownership	Secondary data from 395 Indian firms listed on Bombay Stock Exchange during the years 2001 to 2008	Family ownership and business group affiliation positively support product innovation
Santos, Basso, Kimura, & Kayo (2014)	Technological innovation	Relationship between innovation and performance	Secondary data from 4000 companies in the years 2000, 2003 and 2005 in Brazil	There is no significant relationship between innovation and financial performance
Sartor & Beamish (2014)	Offshoring innovation	How differences in the informal institutions influence MNE´s subsidiaries offshore innovation	157 subsidiaries in 15 emerging market countries from 2001-2009 of Japanese global FDI	Type of uncertainty precipitated by informal institutions is critical to understanding the strategic behavior of foreign investing MNEs

Howard, Steensma, Lyles & Dhanaraj (2016)	Number of new patent collaborations	To study the role of strategic alliance on collaborative innovation	Survey of Lilly and its 55 small biotech partner firms	Alliances help new firms learn specific technologies and commercialize innovation. The greater social interaction between the partner firms and Lilly, the more collaborative innovation
Shin, Kim & Park (2016)	Technological innovation	To study the relationship between alliance type and technological innovation performance	Secondary data of 206 Korean biotechnology firms from period 2005-2012	Vertical alliances have positive impact on innovation, while horizontal alliances have an inverted U-shaped relationship with innovation
Azar & Ciabuschi (2017)	Organizational and technical innovation	Relationship between different types of innovation and export performance of Swedish export firms	Survey of managers of 218 Swedish exporting firms	Organizational innovation improves export performance both directly and indirectly by sustaining technical innovation
Sariol & Abebe (2017)	Exploratory and exploitative innovation	Relationship of CEO power on explorative and exploitative organizational innovation	Survey with CEOs in 532 US firms	A significant positive relationship between CEO power and explorative innovation
Silva, Style, & Lages (2017)	Technical and market Innovation	Relationship between innovation and performance	Survey of 112 top managers of Portuguese manufacturing exporting firms	Technical innovation has a positive impact on economic and strategic export performance. Market innovation negatively impacts with strategic performance
Tabeau, Gemser, Hultink, & Wijnberg (2017)	Product design innovation	Relationship between product design innovation and performance	Survey of 83 projects in the Netherlands, both project managers and external designers as informants	Exploration activities enhance design innovativeness, and design innovativeness leads to better market performance but not process performance
Bouncken, Fredrich, Ritala, & Kraus (2018)	Incremental and radical innovation	The role of coopetition in new product development alliances and focal firm's innovation output	Survey of 1049 alliances in medical and machinery in Germany	Coopetition increases the level of incremental innovation in pre-launch and launch phase, but it increases the level of radical innovation only in launch phase
Un & Rodriguez (2018)	Product innovation	The relationship between R&D collaboration and product innovation for foreign subsidiaries	Survey of 785 manufacturing firms operating in Spain in the period 1998-2002	R&D collaboration with customers is more likely to result in product innovation. For domestic firms, R&D collaboration with universities and suppliers is more likely to result in product innovation

Table 1. Key studies on innovation and performance

Most of the studies seem to have been based on quantitative data having a sample size of 100-399 cases and performance has been included in about half of the studies. From these studies we learn that the internal and external factors of firms have exerted an influence on innovation activities of their organizations (Sartor & Beamish, 2014). Previous studies (e.g. Chen et al., 2014; Lodh et al., 2014) have raised the role of ownership structure which allows firms to assemble and direct the resources necessary for innovation activities to take place in organizations. In addition, Sariol and Abebe (2017) have found a strong association between CEO power and innovation activities. Moreover, existing studies have found that knowledge-sharing and strategic fit are important for innovation activities to take place in organizations (e.g. Sanz-Valle et al., 2011). If parent firms create a good learning environment for the IJVs, parents can learn from each other and from external organizations such as suppliers, distributors, customers, and competitors and then transform the newly acquired knowledge into innovations (e.g. Fang et al., 2011). Similarly, Nielsen and Nielsen (2009) and Jimenez-Jimenez and Sanz-Valle (2011) have proposed that organizational learning helps to increase the level of innovation. Hess and Rothaermel (2011) have emphasized the role of star science in innovation related strategic alliances. On the other hand, Allred and Swan (2004) have found that national culture influences innovation activity. In addition, Nielsen and Nielsen (2009) have emphasized the role of trust on moderating the relationship between tacit knowledge and innovation. Previous research has also shown that foreign firms and local firms should co-operate with different partners to increase innovation activities, the former with customers and competitors and the latter with suppliers and universities (Un & Rodriguez, 2018). Bouncken et al. (2018) have proposed the role of coopetition on the level of incremental and radical innovation in new product development alliances, specifying that coopetition is beneficial for incremental innovation both in pre-launch and launch phases whereas it increases radical innovation in the launch phase.

Luo and Deng (2009) investigated the linkage between partner similarity in an alliance portfolio and innovation and found an inverted U-shaped relationship between them. However, this relationship is positively moderated by firm's age and industry norms. Shin et al. (2016) and Castaner et al. (2014) also found a relationship between partner's type and innovation performance. Similarly, Capaldo (2007) suggested that network structures have greatly influenced the innovation capability of the lead-firm in an alliance network. On the other hand, Chandy and Tellis (1998)

investigated why some firms are more successful in introducing radical product innovations than other firms. They found that willingness of firms to invest in innovations is more crucial for radical product innovation than size of firms. In addition, Jansen et al. (2006) pointed out that the connectedness between firms supports both exploratory and exploitative innovation. They specified that the greater the extent of interactions between alliance partners, the greater the creation of innovation in the alliance. Furthermore, Subrahmanya (2005) maintained that internal environmental factors such as internal-motivation, growth desire, and technological capability promote radical innovation, while external environments such as market development and new customer needs support incremental innovation. Beside internal environment, previous research has suggested that being present in different external environments through international diversification will increase the level of innovation of firms (e.g. Hitt et al., 1997).

Empirical results of the relationship between innovation and performance have yielded controversial results (Rosenbusch et al., 2011). Some studies have suggested that there is a strong link between innovation activities and performance of firms (Damanpour & Evan, 1984; Van Auken et al., 2008; Gunday at al., 2011; Jimenez-Jimenez & Sanz-Valle, 2011; Azar & Drogendijk, 2014; Azar & Ciabuschi, 2017; Silva et al., 2017; Tabeau et al., 2017). Danneels (2002) found that product innovation can enhance a firm´s competence, thus it helps firms to renew their business and performance. Other researchers have emphasized the role of technical innovation on performance (Silva et al., 2017). But some others (e.g. Santos et al., 2014) have found that there is no significant relationship between innovation and financial performance. Similarly, Tabeau et al. (2017) have found that design innovation does not lead to better process performance. On the other hand, Silva et al. (2017) have found that market innovation negatively impacts with performance. Uzkurt et al. (2013) found that organizational culture plays an important role both for innovation and performance of firms. Finally, Li et al. (2017) suggested that the innovation and performance relationship is moderated by institutional factors and dynamism of the environment.

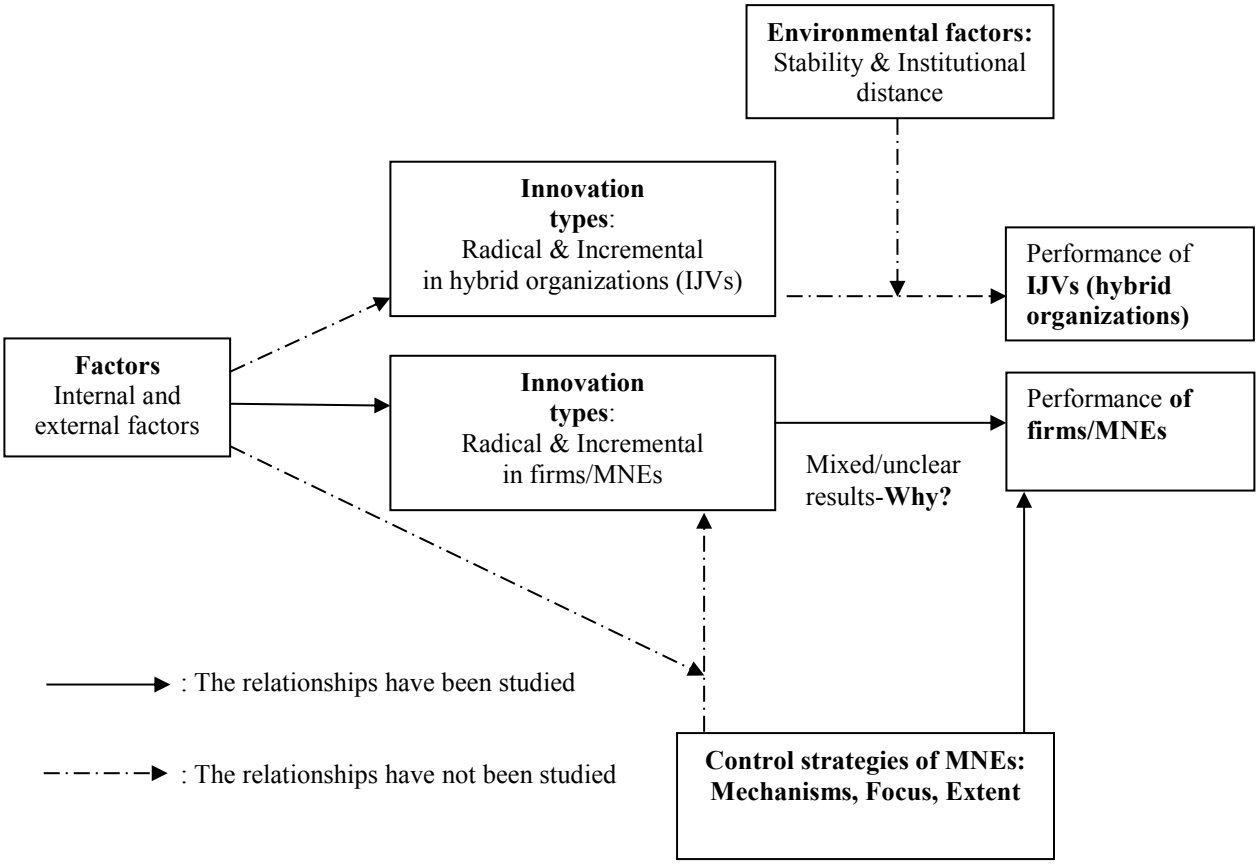


Figure 2: Existing studies and research gaps on innovation and performance

In short, previous studies on innovation have focused on different internal and external factors (e.g. competition, ownerships, CEO power, knowledge sharing, learning, firm´s size, and willingness to innovate) which influence different types of innovations taking place within one single organization (firms/MNEs). There are only very few studies of innovation strategy that have focused on innovation within hybrid organizations such as IJVs (Sampson, 2007; Fang, 2011). In addition, among the very few studies of innovations in hybrid organizations, the focus has been on partner's similarity, partner's fit, trust, and age. The impact of control strategies on innovations in hybrid organizations has still received limited attention. The literature review above also showed that the analysis of relationships between control strategies, innovation strategies, and IJV performance in the same study has been extremely limited so far and none of the previous studies has included all three dimensions of control in the discussion of innovation activity. Most previous studies have focused on the relationship of innovation in general or one specific type of innovation such as technical or product innovation on performance, none of previous studies has investigated

on the decision choice between incremental vs. radical innovations. Furthermore, there are controversial results related to the relationship between innovation and performance within firms/MNEs. Finally, there is a lack of studies focusing on the moderating role of external environmental factors in this relationship. In Figure 2 we summarize the existing empirical findings on the determinants of innovation types and the relationship between innovation and performance, and also present the research gaps.

3. Development of propositions

A key issue for foreign parent firms is how to choose the set of control mechanisms, focus, and extent that allow innovation activities to take place, since organizational control influences learning environments in IJVs (Das & Teng, 2001; Huang & Chiu, 2014). This is important as the learning environment has been found to have a direct impact on innovation activity (Bates & Khasawneh, 2005). Below, we will discuss how different control strategies of parent firms are expected to influence the likelihood that innovations will take place in IJVs.

3.1. Linkage between control strategies and innovation in IJVs

According to network theory (Gulati, 1998; Kogut, 2000), network governance is very important for strategic alliance performance. Bell (2005) maintained that the way firms cooperate in a network has a strong influence on innovation activities. Related to network governance, previous research (Xu & Lu, 2007) has found that parent control has a positive interaction with technological knowledge creation in IJVs because members in IJVs not only learn about environments but also about their partners, as they are from different organizations.

3.1.1. Control mechanisms

Control mechanisms can comprise either formal or social control. According to Damanpour (1991) and Aiken et al. (1980), control mechanisms which focus on formal centralization and bureaucracy reduce the motives of members to interact with each other. This therefore has a negative impact on organizations' learning environments, leading to a negative effect on innovativeness. Similarly, according to Balboni et al. (2017), setting up formal control mechanisms based on complex contractual details is a resource- and time-consuming process, and it limits the flexibility and

creativity of alliance members. Thus, formal control is proposed to be used when there are no concrete social relations between partners (Li et al., 2010).

On the other hand, social control creates opportunities for firms to learn about each other's skills (Makhija & Ganesh, 1997). In addition, social control promotes inter-organizational learning by enhancing a partner's trust and providing a medium through which knowledge can be transferred (Dekker, 2004). Ghauri et al. (2013) and have argued that social control such as training enhances knowledge creation for members of IJVs. In the same vein, Park and Vertinsky (2016) have argued that informal communication plays an important role in knowledge creation and transfer. Furthermore, when parent firms exercise social control, members of organizations feel secure and accepted; this will bring out their creativity (Agbor, 2008). Inkpen and Currall (2004) and Chan et al. (2005) have pointed out that social control that involves active interactions between partners and personal friendship between managers increases knowledge creation in IJVs as it promotes consensus, communication, interaction, and trust among members. Jean et al. (2016) have found that parent firm's mechanisms which encourage knowledge transfer will have a positive impact on innovation. As a result, social control supports innovation activities in the firms (Bates & Khasawneh, 2005). Based on these arguments we suggest that:

Proposition 1a: Formal control is negatively related to innovation activities in IJVs.

Proposition 1b: Social control is positively related to innovation activities in IJVs**.**

3.1.2. Control focus

Focus of control can be divided into result and process control. Parent firms exercising result control usually guide the boards of IJVs to follow the key performance measures that are important for parent firms. Controlling toward the results, parent firms give their IJVs space to be flexible and thus they are able to react as quickly as possible when performance risk increases (Das & Teng, 2001). Result control gives members more freedom to innovate during the operating process and describes the ways that members can achieve targets set by parent firms. Similarly, Tellis et al. (2009) have maintained that internal autonomy is very important for innovation activities of firms, as members who work closely with their customers are allowed to perform their tasks in the way

that they think it is best for the situation, rather than the usual way guided by headquarters. Agbor (2008) has argued that when firms set up a target for their members and give them freedom in the process of achieving the target, they are more likely to produce fresh solutions to the existing problems.

On the other hand, when parent firms exercise process control over their IJVs, they focus on the process which ensures that the members follow the ready-made instructions on how to achieve the targeted outcomes in every step of IJV operations (Das & Teng, 2001). In this alternative, parent firms pay more attention to members' behavior rather than to the precise and objective outcomes. In process control where members must strictly follow different steps of operations, there is relatively less room for interactions and synergy creation between JV partners. This, in turn, is expected to lead to a reduced amount of innovation activities. According to Loewe and Dominiquini (2006), emphasizing the formalization and bureaucratization of process control is not beneficial to innovation activities, since it delays the decision-making processes and reduces the creativity of the partners. Based on the above arguments, we propose that:

Proposition 2a: Process control is negatively related to innovation activities in IJVs.

Proposition 2b: Result control is positively related to innovation activities in IJVs.

3.1.3. Control extent

The control extent can be divided into broad or narrow control. With broad control, partners aim to control all the important areas of the IJV's operations. Choi and Beamish (2004) have argued that broad control by partners will have a negative impact on activities and operation of IJVs. Trąpczyński and Gorynia (2017) have found that excessive control by parent firms has a negative impact on capabilities of firms and it reduces their learning in foreign markets. In contrast, by focusing their control on some specific activities and loosening control over the rest of the IJV activities, thus exercising narrow control, foreign parent firms give incentives for local partner firms to be involved in and contribute to the innovative activities of the IJVs. This may help to reduce the amount of conflicts and increase cooperation between foreign and local IJV members. Previous research has also pointed out that less control from the foreign parent firms, and more involvement of the local parents, are necessary for IJVs to achieve superior performance (Li, 2003; Mantecon et al., 2016). Furthermore,

knowledge about local business environments is a very important input for the innovation activities. This information is likely to be delegated to the local partner (Calantone & Zhao, 2001). Thus, foreign parent firms need to allow room for local firms to utilize their knowledge to innovate in IJVs by exercising less control. As a result, parent firms are likely to exercise less control over their IJVs to promote knowledge transfer and learning among members. This, in turn, encourages innovation activities. In contrast, when parent firms exercise broad control over their members, they restrict members' behaviors in all aspects of IJV operations. This will de-motivate members to interact and learn new things, leading to reduced innovation activities in IJVs. Based on the above discussion, we propose:

Proposition 3a: Broad control is negatively related to innovation activities in IJVs.

Proposition 3b: Narrow control is positively related to innovation activities in IJVs.

3.1.4. The moderating role of corporate culture and IJV experience of partners

According to Tang (1998), the internal environment of a firm is defined by its structure, resources, and culture. Organizational culture can encourage or discourage cooperation, exchange of knowledge, experience, and ideas between members of an organization. Skerlavaj et al. (2010) have stated that organizational culture is an important factor for change initiative and innovations. Furthermore, Büschgens et al. (2013) have found that social control is suitable to be used for group culture and rational culture. They have specified that corporate culture that emphasizes formal control will reduce innovations in organizations. In addition, they have suggested that firms should select a suitable control strategy to fit with their organizational culture and innovation types. Other researchers (e.g. Czaika & Valerd, 2009; Tellis et al., 2009) have argued that corporate culture plays an important role in determining the firm's innovation strategy. They have maintained that firms that are tolerant of risk and promote individual achievements often allow radical innovation activities to take place. In a risk tolerant firm, managers often have internal autonomy and they enjoy decision making authority in making radical innovation decisions (Tellis et al., 2009). On the other hand, firms that exhibit high risk avoidance and are in favor of individual security are often linked to incremental innovation. This is because, in this type of corporate culture, managers are less likely to encourage radical innovation activities which require heavy capital investments in R&D, and there is more uncertainty about the final result of the innovation (Stouthuysen et al.,

2017).

In addition to organizational culture, the IJV experience of partners has been found to be a key internal factor that influences management control design in IJVs (Larimo & Nguyen, 2015). According to Child and Yan (2003), IJV experience has the potential to confer benefits for IJV operation in a partner relationship. Previous experience allows partners to develop more ambitious plans of action and avoid gross mistakes when establishing and managing further IJVs (Li, 1995). Therefore, parent firms who have prior IJV experience are expected to be more willing to go for radical innovation for their IJVs. On the other hand, if partners have no previous experience in IJV operation, they have to put major efforts into establishing routine operations. Thus, they are more concerned with daily operations rather than spending excessive time and resources to make significant changes in the products and operations which are required for radical innovations. As a result, if partners have no IJV experience, they are expected to prefer an incremental innovation strategy for their IJVs. Based on the above arguments and combination of propositions 1-3, we suggest that:

Proposition 4a: Social, result, and narrow control are positively related to radical innovation in risk tolerant and individual achievements' promoting IJVs. In contrast, social, result, and narrow control are positively related to incremental innovation in risk avoidance and individual security-promoting IJVs.

Proposition 4b: Social, result, and narrow control are positively related to radical innovation if partners have IJV experience. In contrast, social, result, and narrow control are positively related to incremental innovation if partners have no IJV experience.

3.2. Linkage between innovation strategies and performance in IJVs: the moderating role of stability of business environment and institutional distance

When discussing the role of the environments on firms' strategic decisions, previous studies have pointed out the stability and institutional characteristics of the environments (Boulton et al., 1982; Xu & Shenkar, 2002; Shirodkar & Konara, 2017). Following previous studies, in this study we are interested in two characteristics of external business environment: 1) stability of the business

environment and 2) institutional distance between partners' home countries.

3.2.1. Stability of the business environment

Stability of the business environment refers to the degree of change and unpredictability of a market environment (Li & Atuahene-Gima, 2001). In a stable business environment, incremental innovation improves firms' efficiency and productivity which in turn increase the level of performance (Esteve-Perez & Manez-Castillejo, 2008). On the other hand, Buddelmeyer et al. (2010) have found that radical innovation activities involving aggressive investments and a lot of changes can increase the probability of failure in a stable environment. Perks et al. (2005) have maintained that radical innovation is costly and time-consuming. However, in a hostile or quickly changing business environment, firms need to maintain competitive advantages compared to their rivals in order to be able to compete and grow, and therefore the focus should be on the creativity and flexibility rather than efficiency of the IJV (Stathakopoulos, 1998). Thus, incremental innovation strategy may not be enough to compete with incumbent firms to achieve higher levels of performance in an uncertain and rapidly changing environment. In this type of environment, firms are more likely to achieve superior performance through radical innovation where they generate breakthrough ideas in technologies and market niches (Jean et al., 2016). Thus, by applying radical innovation strategies, IJVs can offer new products and services, foster growth (Bao et al., 2012), and gain more clearly price/quality ratio advantages over their competitors (Zhou & Li, 2012). Thus, we suggest that:

Proposition 5a: Incremental innovations are positively related to the performance of IJVs located in a stable business environment.

Proposition 5b: Incremental innovations are negatively related to the performance of IJVs located in an unstable business environment.

Proposition 6a: Radical innovations are negatively related to the performance of IJVs located in a stable business environment.

Proposition 6b: Radical innovations are positively related to the performance of IJVs located in an unstable business environment.

3.2.2. Institutional distance between partners' home countries

Institutional factors in international business reflect the rules and belief systems of business environments of the countries (Xu & Shenkar, 2002). According to Scott (1995), institutional distance is defined as the difference between the regulatory, cognitive, and normative environments of the home and host countries of investing firms. Previous studies have shown that institutional distance has been an important driver of MNEs' strategies and performance in host countries (Gaur & Lu, 2007; Sartor & Beamish, 2014; Shirodkar & Konara, 2017). The research on the impact of institutional distance on foreign activities and performance of foreign subsidiaries has become one of the key topics in international business literature (Contractor et al, 2014). Peng et al. (2008) have maintained that when the subsidiaries of MNEs are located in foreign countries, they will be affected by the institutions of the host country. Dikova (2009) and Thomé et al. (2017) found that the impact of institutional distance on performance of firms is mixed. To fill in these gaps in the international business literature, especially in IJV research, we analyze how institutional distance is expected to moderate (increase or decrease) the relationship between innovation strategies and IJV performance.

Xu and Shenkar (2002) have maintained that when the institutional distance is high, members of IJVs may have difficulties to communicate and understand each other. Thus, significant changes in IJV operations may create chaos in the units. The process of significant changes can also create conflicts between members as they can interpret the changing processes and activities differently from each other. Furthermore, a high institutional distance between partners' home countries is expected to decrease knowledge exchange between the IJV partners (Tey & Idris, 2012; Li et al., 2015). As a result, radical innovation can lead to a reduced level of IJV performance when the institutional distance is large. On the other hand, incremental innovation may work better when the institutional distance is high, as this strategy minimizes the risk of creating chaos between IJV members. In contrast, in low institutionally distant business environments, IJV members have business environmental characteristics that are similar to those of their home countries. As such, the institutional distance has no specific effect on learning environments in IJVs between local and foreign members. As a result, a low institutional distance between IJV partners' home countries is expected not to have any impact on the relationship between innovation strategies and IJV performance. Based on these arguments we propose that:

Proposition 7a: Incremental innovations are positively related to the performance of IJVs located in a high institutional distance business environment.

Proposition 7b: Radical innovations are negatively related to the performance of IJVs located in a high institutional distance business environment.

Proposition 7c: There is no moderating impact of institutional distance on the relationship between innovation strategies and performance of IJVs located in a low institutional distance business environment.

4. Discussion and conclusions

4.1. Summary of research propositions

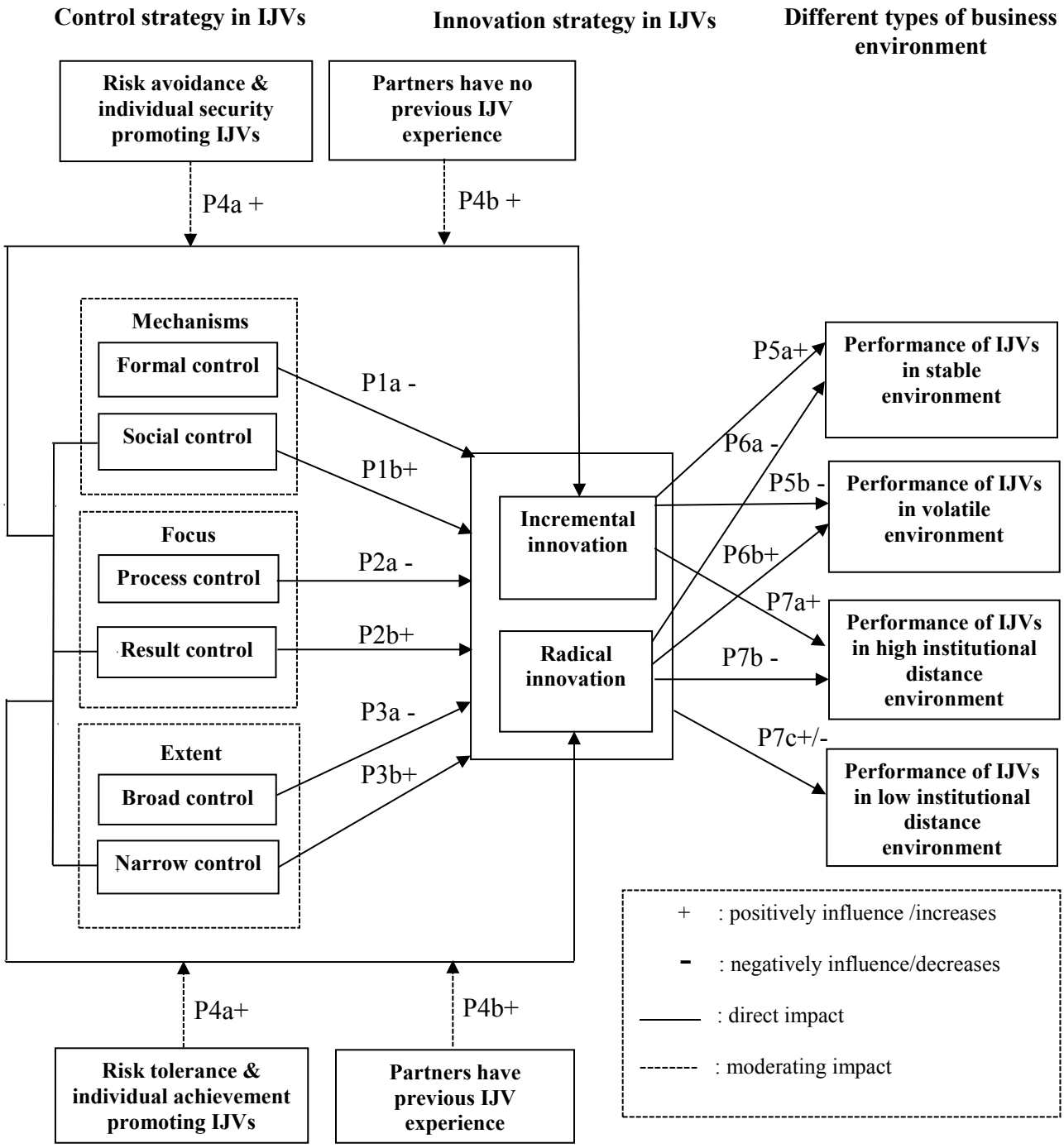
Bouncken et al. (2018) have maintained that cooperative strategies between partners have implications for innovations. Aiming to contribute to control literature in the specific context of IJVs, our study continues the research stream of e.g. Geringer and Hebert (1989), Nguyen et al. (2016a), and Puck et al. (2016) who have raised the important role of parent control on IJV operations. Our study investigates the role of control strategies including mechanisms, focus, and extent on IJV innovation activity such as incremental innovation and radical innovation. We further expand control literature in IJVs by analyzing how control strategies are linked to innovation types under internal environment-moderating factors. Our study makes an important contribution to the IJV performance literature (e.g. Mjoen & Tallman, 1997; Glaister & Buckley, 1998; Lu & Hebert, 2005; Nguyen et al., 2016b) because we specify how innovation types are expected to be associated with IJV performance in different external environment situations.

More specifically, our model shows that social, narrow, and result control exercised by parent firms allow knowledge creation to take place in IJVs as they promote inter-partner communication, trust, and commitments for members of IJVs. This, in turn, increases innovation activities in IJVs. On the other hand, formal, broad, and process control emphasize formal, tight, and strict rules that restrict the behavior of IJV members. These control strategies demotivate IJV partners from cooperating

and pouring their resources together. Thus, they may have an adverse impact on innovation activities in IJVs. Previous research (e.g. Fang, 2001; Sartor & Beamish, 2014) has pointed out the role of internal environments on partner relationship and innovation activities. Related to the relationship between control strategies and innovation types, our theoretical discussions show that internal environments of firms, such as corporate culture and IJV experience of partners, play important moderating roles as they also have direct influence on knowledge transfer in IJVs. Thus, depending on corporate culture and whether partners have previous IJV experience or not, social, narrow, and result control will be associated with incremental or radical innovation.

Regarding the relationship between innovation strategies of parent firms and performance of IJVs, our theoretical analysis shows that innovations do not always increase the level of performance of IJVs. In addition, our study shows that different innovation strategies should align with external business environments in order to increase the levels of IJVs' performance. In particular, incremental innovation strategy is expected to work better for IJVs located in a stable business environment, as this strategy does not require heavy investments and fundamental changes, but it can still improve their competitive advantages and strengthen firms' market position. In contrast, when the business environment is unstable, firms need to create competitive advantages that are unique and can last longer in the markets, to be able to compete with incumbent firms. Therefore, incremental changes in IJV's products, services, or processes may not be enough to compete in unstable markets, leading to higher probability of the IJV failing.

Thus, fundamental changes in products, services, or processes are necessary to obtain competitive advantages over the IJV's competitors. In addition, our study implies that when the institutional distance between partners' home countries is high, radical innovation strategy should be avoided and incremental innovation strategy is expected to lead to better IJV performance. Our propositions are summarized in Figure 3.



P1-P4: the relationships between control strategies and innovation activities in IJVs and the moderating effects of internal environmental factors. **P5-P7**: the impacts of innovation strategies (i.e. radical versus incremental innovation) on the performance of IJVs operating in different types of business environments.

Figure 3. Relationships between control strategies, innovation activities and types and performance in different types of IJV external environments

4.2. Contributions

This study contributes to IJV control theory (Brenner & Ambos 2013; Harzing, 1999) and especially to IJV control literature (Geringer & Hebert, 1989). The study extends previous studies by analyzing not only the role of control on innovation activities of an organization but also the interaction effect of control strategies and internal environmental factors on innovation types. Furthermore, this study contributes to network theory (e.g. Gulati, 1998; Goerzen, 2005, 2007). The network theory has emphasized the role of governance of network on performance of alliances. This study extends the theory by proposing the impact of different control strategies by partners on innovations of equity alliances (IJVs).

Previous studies (e.g. Das & Teng, 2001; Lu & Hebert, 2005; Xu & Lu, 2007; Tiwana, 2008; Lawson et al., 2009; Larimo & Nguyen, 2015; Mantecon et al., 2016; Nguyen et al., 2016b; Puck et al., 2016; Trąpczyński & Gorynia, 2017) in particular have investigated the relationship between parent control and performance of IJVs. This study extends previous studies by adding the analysis of the relationship between control strategies and performance of IJVs through the role of innovation. We extend the present literature by showing how different types of innovation strategies in IJVs (incremental versus radical innovation) are expected to impact differently on performance in various situations. Our study specifies the cases in which firms should carry out incremental innovation and in which situations firms need radical innovations to increase the levels of IJVs' performance. In this respect, our conclusions are consistent with Rosenbusch et al. (2011) who have suggested that the relationship between innovation and performance depends on the contextual factors. We extend their views by proposing in more detail the contexts in which this relationship is expected to be positive, negative, and non-significant. If firms select the wrong innovation strategy, this may lead to negative performance or even to a failure.

Previous research (e.g. Fang, 2011) has also raised the important role of the dynamism in the environment as a moderating factor of knowledge complementarity and innovation. Extending this point, we suggest the moderating role of environments in the relationship between control and innovation and between innovation strategy and performance. We go further than previous studies by integrating variables related to two internal environments (corporate culture and partners' IJV experience) as well as two external environments (stability and institutional distance), and their

moderating influence on the relationships between control strategy, innovation activities and types, and IJV performance.

The use of IJVs as the mode of foreign expansion is nowadays very common not only for large MNEs but also for SMEs. For managers, we offer a model that can be used when firms design their strategies for their IJVs. Our model illustrates the importance of the right choice of control strategy by parent firms to encourage innovation activities to take place in an IJV context. This is an important contribution of the paper since innovation is crucial for the performance of firms in an increasingly competitive global marketplace. Furthermore, we also specify the expected links between control strategies and innovation activities in different kinds of corporate cultures, an issue that has not been analyzed so far in an IJV context.

4.3. Limitations and future research avenues

First of all, this study focused on the viewpoint of the IJV partners who have majority or 50/50 ownership in the IJV, thus we excluded the role of minority ownership partners. Although this kind of partnership may not have much control over the strategies of IJVs, they may contribute in some way to the key technology needed for innovations or they may offer breakthrough ideas for IJVs. Therefore, future studies investigating the role of minority partners of IJVs in the relationship between control choices, innovation strategies and performance would also be of great interest. Second, we discussed the relationship between control mechanisms and innovation; we assumed that the parent firms use either formal or social control mechanisms, but in practice, both control mechanisms can be applied at the same time. Similarly, firms can also exercise process and result control focus and broad and narrow control extent at the same time. Future studies may thus also analyze the impact of one versus multiple control strategies on innovation and performance.

Third, in this study, we categorized innovation into incremental and radical innovation based on the degree of innovativeness. Future research can use our framework with a different classification of innovation such as service versus product innovation (Labitzke et al., 2014) and market and technology innovation (Silva et al., 2017). Fourth, we assume that parent firms use only one type of innovation strategy, such as incremental or radical innovation, for the focal IJVs. Since large IJVs can have different divisions with different focus and strategies and operate in different countries,

such as service, production, marketing, and logistic division, parent firms may carry out different innovation strategies for different divisions. Therefore, further studies focusing on this issue would be of great interest. Furthermore, contributions from partners to IJVs have also played an important role on how controls are to be divided between partners (Blodgett, 1991; Choi & Beamish, 2004; Chen et al., 2009). Resources contributed by partners are crucial for innovation activities and performance of IJVs. As a result, future study should investigate the moderating role of contributions on the control and innovation relationship.

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