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Exploring instances of deviation in joint ventures between partners' equity share and board representation

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Abstract

Purpose – To date, there has been little research about the degree of correspondence between partner equity ownership and partner representation on boards of joint ventures (JVs). It is generally assumed that partners' share equals board representation in percentage. This paper aims to explore various instances of deviation from the above norm.

Design/methodology/approach – Using a unique database of 259 JV contracts extracted from the US Securities and Exchange Commission, and by drawing from resource dependency and transaction cost theories, this manuscript explores the factors that increase or decrease the deviation between equity share and board representation.

Findings – The results show that international JVs (IJVs) tend to deviate more, while JVs with a deadlock clause, a large board and based in a stable country deviate less from the degree of correspondence between equity share and board representation.

Originality/value – This study contributes to the alliance and governance literatures by identifying factors that influence the degree of correspondence between partner investment (equity share) and control through board of director representation.

Keywords Joint ventures, Alliance governance, Joint venture boards, Joint venture equity share, Joint venture control

Paper type Research paper

1. Introduction

Joint ventures (JVs) are managed through governance mechanisms such as contracts, equity share and boards of directors (Harrigan, 1988; Klijn *et al.*, 2017). Partner interests represented through their share of equity is a known control mechanism that has been extensively studied (Madhok, 2006; Mjoen and Tallman, 1997), but research has shown that equity share is not the only control mechanism (Madhok, 2006). While JV boards are the crucial *expost* governance mechanism that protects the partner's interests through administrative control and decision monitoring and approval (Harrigan, 1988), they have received considerably less research attention. Even less research addresses the degree of correspondence between JV equity share and partner board representation (Reuer and Klijn, 2018). Because of normally high correspondence between equity share and partner board representation, equity share has been regarded as a common proxy for board representation and JV control (Cuypers *et al.*, 2017). In fact, the degrees of correspondence vary considerably. For example, in 2003, the equity shares of the international JV (IJV) of Enova Systems and Hyundai Heavy Industries were 40 and 60 per cent, respectively, and so was board representation. However, in the 2010, Higa Corporation and Bio Clean apparent 50/50

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JV, board representation was 80/20. In this study, I explore instances where JVs deviate from the expected correlation between equity share and board representation.

Cuypers *et al.* (2017) published the first study on partner board representation in JVs, exploring factors that influence foreign partner board representation in IJVs. They confirmed a high correlation between IJV equity share and board representation and reported that this correlation was moderated by the characteristics of IJV and host country. However, their sample only included Chinese JVs, and there are no studies covering JVs in other countries. I use their study and their research agenda to continue this conversation by analyzing board representation of a larger and unique JV contract data set that includes both domestic and international JVs. Additionally, a new dependent variable I term *equity share–board representation deviation* aims to provide a broader and straightforward understanding of factors that affect the correlation between equity share and board representation. It sets the scene for a research agenda that could explore each of these factors independently.

This manuscript makes the following contributions. It uses complete JV contracts to study boards and their degree of correspondence to equity share and further links the JV governance and literature on boards. It is also one of the few studies examining JVs that deviate from the commonly assumed correlation between equity share and board representation. Finally, it gives scholars and practitioners insights on the alignment of governance mechanisms during JV negotiations and contract design. The study analyzes factors that affect the degree of correspondence between joint venture equity ownership and board representation and when the equity share formula is commonly applied to board representation.

The study continues with a review of the literature on governance mechanisms and the correspondence between JV equity share and board of director representation, including the theoretical background and hypotheses. Section 2 provides review of the literature, theory and hypotheses development; Section 3 provides methodology; Section 4 provides the results of the study; Section 5 discusses the limitations and future research; and Section 6 concludes.

2. Review of the literature, theory and hypotheses development

A governance structure is a bundle of mechanisms that support, control and guide a firm's economic transactions (Parkhe, 1993; Rediker and Seth, 1995). Alliance research investigates how partner firms maximize alliance efficiency through the implementation and alignment of governance mechanisms that enhance monitoring and coordination while mitigating the costs of opportunistic behaviors (Hansen *et al.*, 2008; Sampson, 2004).

Recent research examines alliance and JV formal governance mechanisms in more detail, including contracts (Luo, 2005; Reuer and Arino, 2007), management committees (Reuer and Devarakonda, 2016) and boards of directors (Cuypers *et al.*, 2017; Klijn *et al.*, 2017). Transaction cost economics (TCE) explores optimal alliance governance structures that can mitigate uncertainty and partner opportunism and therefore minimize transaction costs (Gulati, 1995).

2.1 Governance mechanisms in joint ventures

"A joint venture occurs when two or more firms pool a portion of their resources within a common legal organization" (Kogut and Singh, 1988, p. 319). JVs are the most complex type of strategic alliance in terms of governance structure, as partners exert control through shared ownership and representation on the board of directors (Beamish and Lupton, 2009; Kamminga and Van der Meer-Kooistra, 2007). JVs are governed through formal

mechanisms that include contracts, equity ownership and boards (Chalos and O'Connor, 2004; Chen *et al.*, 2009; Kumar and Seth, 1998).

As in regular firms, JV governance mechanisms do not work independently but in an interactive bundle configured according to the desired level of partner control of the JV and the need for autonomy (Harrigan, 1988; Rediker and Seth, 1995). Yet studies of JV governance mechanism interaction are scarce (Reuer and Klijn, 2018).

JV equity share is commonly used to categorize JVs and to determine the percentage of board participation and control (Cuypers *et al.*, 2017; Mjoen and Tallman, 1997). But equity share does not necessarily mirror control (Chen *et al.*, 2009; Madhok, 2006). The JV board is a governance mechanism through which parties also exert control and have advising, mediating and monitoring roles (Duplat *et al.*, 2018). The boards make decisions while aligning the interests of the parties and the JV (Harrigan, 1988), which may entail resolving conflicts and protecting the interests of the venture over those of the partners (Shishido, 1987). Therefore, misappropriation hazards may increase, as board members have access to privileged information that could be leaked to the partner firm they represent on the board (Reuer *et al.*, 2011; Smith, 2005). Choosing the percentage and number of JV board seats for each partner is a delicate decision that merits careful attention.

A convenient solution is to associate the partner percentage of equity share to representation on the board. In fact, some researchers have found a high correlation between these two governance mechanisms. For instance, Cuypers *et al.* (2017) found a 0.76 correlation between equity ownership and board representation in Chinese IJVs. However, no studies exist on a broader set of JVs to determine if this correlation is especially high for Sino-foreign JVs and how it varies depending on the host country and other factors. A high correlation still leaves deviations that may help us understand how firms balance JV ownership and control by assigning a representation percentage to the board based on other than an equity percentage. We need to identify when the equity share formula is not used to assign seats on the JV board, especially since devising a new board representation formula requires careful analysis and negotiations that are both costly and time consuming (Cuypers *et al.*, 2017).

I study cases in which JVs deviate from the equity share–board representation formula. I use the discriminant alignment principle from TCE to explore transactional conditions, such as contractual deadlock safeguards, type of joint venture and board size, as well as environmental uncertainty conditions (rule of law), that increase the chances of opportunism and costs and suggest a need for better equity ownership and board representation alignment. I counterbalance these opportunism claims of TCE with resource dependency theory, which proposes that boards are important tools to access local resources where the JV operates.

2.2 Contractual safeguards: deadlock

Deadlock occurs when the JV board cannot reach consensus on a matter (Buchel, 2003). As a solution, contractual governance mechanisms offer a deadlock clause that specifies the actions to follow when a decision is at a standstill (Kozyris, 1969). Deadlock clauses are not exclusive to JV boards (all firm boards may enter them) and they have been extensively studied in the legal literature. These mechanisms offer a cost-efficient way to resolve conflicts instead of costly legal battles (Hoberman, 2001; Israels, 1951; Kim, 2003).

If parties do not agree, deadlock can even lead to the termination of the JV and it is not uncommon for one of the parties to act opportunistically and block decision-making at the board level, causing termination of the JV without having to breach the contract (Landeo and Spier, 2014; Smith, 2005). A deadlock clause in the JV agreement prevents possible

partner opportunism, litigation and JV termination by providing specific instructions, such as temporary delegation of decision power or extraordinary meetings (Glover and Wasserman, 2003). Negotiating and designing deadlock clauses is costly but they can be implemented quickly and the expense may offset the costs of other conflict resolution measures (Landeo and Spier, 2014).

JV agreements with deadlock clauses signal that the parties anticipate a complex relationship. From a TCE perspective, to mitigate partner opportunistic behavior and possible unpunishable JV termination, partners may opt to protect their investment in the JV (equity share), by aligning it with their decision power (board representation).Therefore, I hypothesize that:

H1. The degree of correspondence between a partner's equity ownership percentage and board representation percentage shows a lower deviation in joint ventures that include deadlock clauses in their contracts than in joint ventures that do not have such clauses.

2.3 Joint venture board size

The corporate governance and finance literature on the relationship between board size and performance in regular firms is abundant but has still not reached consensus (Eisenberg *et al.*, 1998; Erhardt *et al.*, 2003; Guest, 2009). Research on the positive effects of board size on firm performance has typically drawn on resource dependency theory to explain that a greater number of board members increases access to useful external linkages and resources (Goodstein *et al.*, 1994; Pfeffer and Salancik, 2003). However, some scholars argued that larger boards are more difficult to manage (Yermack, 1996). Research that tries to reconcile these contradictory results have argued that the positive or negative effects of board size on firm performance varies considerably depending on too many factors and therefore no consensus has been reached (Mak and Li, 2001).

There is no research exploring the effects of board size on JV performance, and while this is not the objective of this study, I explore the effect of JV board size on the correspondence between partner equity ownership percentage and board representation. Resource dependency theory suggests that larger boards are better when the JV needs access to a variety of external linkages, contacts and resources (Pfeffer and Salancik, 2003). Larger boards increase the collective knowledge, including monitoring and controlling capabilities (Pfeffer and Salancik, 2003). But members of a JV board with access to privileged information may be tempted to leak it to their parent firm. Therefore, through a transaction cost economics lens, the larger the JV board, the higher the risks and costs associated with moral hazard and opportunism. Consequently, a tighter alignment between the partner's investment in equity share and board representation may be needed. I posit that:

H2. The larger a joint venture board, the lesser the deviation in the degree of correspondence between partner equity ownership percentage and board representation percentage.

2.4 Type of joint venture activity: high-tech and low-tech

R&D and high-tech projects carry substantial uncertainty and demand more control to protect knowledge. Internalization, which implies the exploitation of knowledge within the boundaries of the firm, minimizes uncertainty and increases control (Williamson, 1979). Therefore, as technological complexity increases, internalization becomes an increasingly

attractive option over JVs insofar as it reduces the risk of knowledge misappropriation (Osborn and Baughn, 1990). Such considerations notwithstanding JVs remain a good innovation vehicle when possible partner firms have complementary resources and not enough resources to innovate internally (Cantwell and Colombo, 2000; Nakamura *et al.*, 1996).

TCE suggests that in cases such as high-tech JVs requiring large investments and exchanges of tacit knowledge, the risk of misappropriation is high; accordingly, tight governance mechanisms are required (Chalos and O'Connor, 2004; Teece, 1996; Williamson, 1996). Therefore, close monitoring, coordination and exchange facilitation functions from the board are necessary (Richards and Yang, 2007). Additionally, governance mechanisms such as the share of equity and board representation should be aligned to control and protect partner investments (represented in their equity ownership). For example, in 2012, the equity shares of the Changchun Eco-Power Technology and Ecotality Asia Pacific JV for the production of electric vehicles were 60 and 40 per cent, respectively, mirrored board representation with three and two members. Therefore:

H3. The degree of correspondence between partner equity ownership percentage and board representation shows a lower deviation in high-tech joint ventures than in low-tech joint ventures.

2.5 Domestic vs international joint ventures

IJVs are especially complex, as they are formed by firms from different countries (Geringer and Hebert, 1991). Their high failure rate reflects the unexpected challenges, risks and uncertainty created by differences in institutions, legal systems and cultures (Dacin *et al.*, 1997). From a TCE perspective, as IJVs are subject to increased risks of misappropriation hazards and partner opportunism, governance mechanisms such as thorough contracts and a board of directors should help ensure better monitoring and risk mitigation (Luo, 2005). The theory would also suggest tighter control through a closer degree of correspondence between partner equity share percentage and board participation. Nevertheless, one of the main reasons IJVs are used over other modes of entry to foreign markets is the access to local resources and connections that a host partner can provide (Kogut and Singh, 1988). According to resource dependence theory, the host partner and its members on the board can become instruments of JV success. Host country board members have local knowledge, connections and overall better access to local resources than the foreign firm (Pfeffer and Salancik, 2003). Owing to the need of IJVs to accordingly give more authority to the host partner, I posit:

H4. The degree of correspondence between partner equity ownership percentage and board representation shows a greater deviation in international joint ventures than in domestic joint ventures.

2.6 Environmental uncertainty and joint venture host country rule of law

A country's rule of law depends on how well the laws and norms are followed, how well the intellectual property rights are protected and contracts are enforced. The law affects the quality of courts, police and the likelihood of political unrest and violence. The more stringent the rule of law, the more stable the country and the lower its environmental uncertainty (Brunetti and Weder, 1998).

JV governance balances partner control and the autonomy of the entity (Harrigan, 1988). From a resource dependency theory perspective, a JV board's need for autonomy and flexibility increases as environmental uncertainty rises (Kumar and Seth, 1998; Pfeffer and Salancik, 2003), and board representation is less likely to mirror equity share, as it is designed to respond to environmental contingencies. For example, in the case of the Thailand-hosted JV between Hua Kee Company and the American firm Foamex, Hua Kee holds 30 per cent of equity share but 50 per cent of representation on the board, with three directors on a board of six. Thailand has a weak rule of law and the Thai firm may have been given more representation on the board to adapt to the local environment. Therefore:

H5(a). The weaker the rule of law in a joint venture host country, the higher the deviation in the degree of correspondence between partner equity ownership percentage and board representation.

On the other hand, the reverse can also happen. For instance, in US-hosted JV between the American firm Semotus Solutions, which holds 60 per cent of equity, and Outercurve Technologies, which holds 40 per cent of equity, the contract establishes three directors from the US partner and two from Outercurve.

This is in line with TCE, which suggests that environmental uncertainty increases opportunism hazards. As the JV is hosted in the US where there is a stronger rule of law, environmental uncertainty is lower and so are misappropriation hazards. Boards may not require extra autonomy and partner firms may choose to align the equity formula to board participation and lower additional costs of contractual negotiations and board design. Therefore:

H5(b). The stronger the rule of law in a JV's host country, the lesser the deviation in the degree of correspondence between partner equity ownership percentage and board representation.

3. Methodology

3.1 Sample collection and description

Cuypers *et al.* (2017) studied the relationship between equity share and board representation in Chinese IJVs through survey data. This study extends the topic to worldwide domestic and international JVs by analyzing actual JV contracts. I join a few management scholars using contract data from SEC filings (Hegde, 2014). Specifically, I deploy an automated process written in the coding language *Python 2.7*, which extracted an initial sample of 623 JV contracts from 2000 to 2016 from the EDGAR database of the US Securities and Exchange Commission (SEC) (Velez-Calle, 2018).

I study the degree of correspondence between equity share and board participation among bilateral JVs, with a sample of 510 contracts. As 164 of these contracts do not establish a board of directors, and further 81 do not contain adequate information on both the parties' percentage of equity share and their representation on the board, the final sample consists of 265 JV contracts. In 41 per cent (108) of the JVs, partner equity share is equal to the percentage of board representation. There is no deviation and the correlation is perfect. However, in most cases there is a deviation ranging from 0.1 to 56.

3.2 Measures

3.2.1 Dependent variable. JV equity share–board representation deviation is calculated as the absolute value of the difference between one of the partner's percentage of equity share

and the percentage of board representation. The value ranges from 0 to 100. No deviation is represented by 0 or that the correlation between equity share and board is represented by 1 (for example, 40 per cent equity share and 40 per cent board representation). The variable takes a value of 100 when the deviation is highest and there is no correlation between equity share and board representation. The lower the deviation, the higher the correlation and vice versa.

3.2.2 Independent variables. Deadlock clause: A binary variable coded 1 when there is a deadlock provision in the joint venture agreement or 0 otherwise.

JV Board Size: The sum of the number of partner members on the board.

Type of JV activity (high-tech JVs): A binary variable marked as 1 for high-tech JVs and 0 otherwise.

Domestic or international JV: A binary variable marked 0 for domestic and 1 for international JVs.

Host country's rule of law (ROL): I use the World Bank Databank to obtain the rule of law index for each of the host countries and for the year the contract was signed. The index ranges from −2.5 (weak rule of law) to 2.5 (strong rule of law). For parsimony, I transform it by adding 3.5 to each observation to make the index take positive values ranging from 1 to 6.

3.2.3 Control variables. Year: I control for time-fixed effects.

Industry: I use six industry classifications as dummies to control industry effects.

External board member: I control for JVs that have an external board member with a binary variable marked 1 if the JV has an external board member and 0 otherwise.

Difference in partner firm size: As in previous studies, I use the number of employees as a proxy for firm size (Khavul, Pérez-Nordtvedt, and Wood, 2010; Sadeghi, Rose, and Chetty, 2018) and control for the difference in size between partner firms, as the larger firm may tend to assume more control. The variable is calculated as the absolute value of the difference in employee size between the partners.

Previous JVs: To control for informal governance mechanisms such as relationships (Poppo and Zenger, 2002), I use a variable marked 1 if the partners had previous JVs with each other and marked 0 otherwise (Duplat and Lumineau, 2016).

3.2.4 Model estimation. I use the software STATA to test the hypotheses with a generalized linear model (GLM) with the following formula:

$$\begin{aligned}\text{JV Equity} - \text{Board Representation Deviation} = {} & \beta 0 + \beta 1\,\text{Deadlock Clause} \\ & + \beta 2\text{JV Board Size} + \beta 4\,\text{High} - \text{Tech JV} \\ & + \beta 3\ \text{Domestic/International JV} \\ & + \beta 4\,\text{Host Country}'s\,\text{ROL} + \beta 5\,\text{Year} \\ & + \sum_{i=1}^{5} \beta_{6,i}\,\text{Industry}_i \\ & + \beta 7\,\text{External boardmember} \\ & + \beta 8\,\text{Partners size difference} \\ & + \beta 9\text{JV experience} + \varepsilon\end{aligned}$$

4. Results

Table I shows descriptive statistics and a correlation matrix. I calculated the variance inflation factors (VIFs) to check for multicollinearity, which had values well below the recommended maximum of 10 (Chatterjee and Price, 1991), with the highest VIF at 2.13 and a total average of 1.57.

Table II shows the GLM regression models. Model 1 shows the regression with only the control variables; I add each independent variable related to the hypotheses in each of the succeeding models. The final regression, including all controls and independent variables, is presented in Model 7.

H1 posits that the deviation between JV partner percentage of equity share and percentage of board representation is lower for JVs with a deadlock solution clause. This is supported by Models 2 ($p < 0.001$) and 7 ($p < 0.001$) with a significant negative relationship. A lower deviation translates into a relationship between the contractual inclusion of this clause and a higher degree of correspondence between partner equity share and representation on the board. The correlation is 0.72 in JVs that include a contractual deadlock provision compared to JVs without a deadlock clause at 0.61.

H2 suggests that the larger the board, the lower the deviation between partner equity ownership percentage and partner representation on the board. This is supported by Models 3 ($p < 0.10$) and 7 ($p < 0.001$) with a statistically significant negative relationship. The correlation between equity share and board participation is higher when boards are larger, for example, 0.91 for JVs with a board of 7 members compared to a correlation of 0.53 for boards with 3 members.

There is no support in Models 4 and 7 for *H3*, which posits that in high-tech JVs, the deviation from the equity share and board representation formula is lower, as it is expected that monitoring and governance mechanisms are tighter for high-tech JVs. Other mechanisms such as extra safeguards, a side licensing agreement or non-compete clauses may play a role in high-tech JVs to prevent opportunism.

H4, which suggests that the deviation between the percentage of equity share and the percentage of board participation is higher for international over domestic JVs, is supported as evidenced in Models 5 ($p < 0.01$) and 7 ($p < 0.01$). Results show a significant positive relationship between IJVs and the deviation gap between partner percentage of equity share and board representation. Therefore, the degree of correspondence between these two governance mechanisms is lower in IJVs. For example, the correlation is 0.55 in IJVs and 0.71 in domestic JVs.

H5(a), which states that the deviation between the percentage of equity share and board participation is higher for JVs hosted in countries with a weaker rule of law than in those

Variable	Obs.	Mean	SD	1	2	3	4	5	6	7	8
1 Board representation deviation	282	7.35	10.19	1.00							
2 Deadlock	282	0.30	0.46	*−0.26*	1.00						
3 Board size	265	4.31	1.74	−0.11	0.09	1.00					
4 High-tech JV	282	0.36	0.48	−0.01	*0.13*	*0.28*	1.00				
5 IJV	282	0.58	0.49	0.12	*0.14*	*0.30*	*0.25*	1.00			
6 Host country rule of law	275	4.41	0.96	*−0.21*	*0.15*	*−0.42*	*−0.33*	*−0.27*	1.00		
7 Previous JV between the partners	282	0.05	0.22	*−0.13*	*0.17*	0.03	*0.17*	0.09	0.06	1.00	
8 External directors	282	0.17	0.38	0.01	*0.15*	*0.19*	0.04	*0.12*	−0.11	0.06	1.00

Note: Italic numbers $p < 0.05$

Table I.
Descriptive statistics and correlation matrix

Table II.
GLM Regression results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Dependent variable: JV equity share–board representation deviation							
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes
External board member(s)	1.05 (1.68)	1.6 (1.65)	1.11 (1.73)	1.19 (1.68)	0.69 (1.67)	0.57 (1.70)	1.72 (1.68)
Firm size difference	−0.17 (0.33)	−0.10 (0.32)	−0.17 (0.34)	−0.13 (0.33)	−0.14 (0.32)	−0.20 (0.33)	−0.05 (0.33)
Previous JV between the parties	−4.67 (2.92)	−3.75 (2.86)	−4.96+ (2.98)	−5.31+ (2.95)	−5.42+ (2.89)	−4.54 (2.99)	−4.80 (2.98)
Deadlock clause (*H1*)		−5.00*** (1.39)					−5.19*** (1.45)
JV board size (*H2*)			−0.69+ (0.42)				−1.47*** (0.43)
High-/low-tech JV (*H3*)				2.19 (1.66)			1.91 (1.70)
Domestic/international JV (*H4*)					3.52** (1.30)		3.95** (1.38)
Host country rule of law (*H5*)						−2.67*** (0.70)	−2.20** (0.79)
Constant	7.32** (2.47)	8.32*** (2.43)	10.98*** (3.17)	5.68* (2.76)	4.75+ (2.62)	18.02*** (3.71)	20.06*** (5.14)
Log likelihood	−1,040	−1,033	−980	−1,039	−1,036	−1,009	−939
Chi-square	26	40	28	28	34	41	71
AIC	2,135	2,123	2,015	2,135	2129	2074	1941
Number of observations	282	282	265	282	282	275	259

Notes: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; AIC = akaike information criterion

hosted within countries with a stronger rule of law, is not supported, as evidenced in Models 6 and 7. However, *H5(b)* is supported by the negative relationship between a stronger rule of law and the deviation between partner equity share percentage and board representation, as shown in Models 6 ($p < 0.001$) and 7 ($p < 0.01$).

5. Discussion, limitations and future research

JV negotiations and contract design include a key managerial choice related to the alignment of the percentage of partner equity share and percentage of representation on the board. Management can use the same percentage of representation for both equity and board, an inexpensive and easy solution. The second choice, while costly and slow but possibly more beneficial, entails changing the formula by using different ratios. This decision changes the balance of control and decision-making but may optimize JV governance by properly aligning these two governance mechanisms to the specific exigencies of a given case. Negotiating partner representation on the board should take into account the potential desirability of disproportional alignment between equity and board representation.

This study confirms that the correlation between JV equity share and board representation is high but varies depending on several factors. The correlation is higher in JVs that include a deadlock provision, JVs with larger boards and JVs established in stable economies. Conversely, the above correlation is lower in IJVs.

The contractual governance mechanism known as the *deadlock clause* offers a solution when other governance mechanisms fail or block one another (Kozyris, 1969). The existence of a deadlock clause is related to a lower deviation between equity share and board representation. Future research might explore the negotiation and implementation of this clause and tell us when they should be designed in contractual negotiations.

This study also finds that the deviation from JV partner equity share and board participation is lower when boards are larger, but it is limited in explaining the reasons. A possible explanation may be because of the fact that it is easier to divide a percentage of ownership stake among a larger number of board seats than among a smaller number. Venues for future research involving JV board composition include ideal board size, board member roles and the role of external directors. For example, in this paper, a control variable shows that external directors have no apparent relationship with the equity share and board representation formula. However, the effects of external JV board directors on performance have yet to be studied. Additionally, whereas the impact of board size on firms performance has been broadly studied with contradicting results (Dalton *et al.*, 1999; Paniagua *et al.*, 2018), no studies examine the impact of JV boards on JV performance, opening an unexplored research area.

In addition, under some circumstances such as IJVs, a close degree of correspondence between equity share and board representation may lower misappropriation costs but also reduce the autonomy of the venture, given that an equal distribution between equity share and board representation may decrease the boards' capacity to deal with the environmental volatility (Harrigan, 1988). Therefore, a board composed to match the IJVs host environment rather than partner ownership is more autonomous and better able to make decisions based on the ventures' needs rather than those of the individual partners.

The deviation between equity share and board representation in IJVs as resource dependency theory indicates, is partly because of the host partner receiving higher board representation, as local members are familiar with the host country and have better access to strategic resources, such as local contacts, local knowledge and raw materials (Pfeffer and Salancik, 2003). This study reports a correlation of 0.58 in a general sample of IJVs. However, Cuypers *et al.* (2017) found a high correlation of 0.76 between equity share and

board participation in Sino-foreign JVs. It would appear that better aligned governance mechanisms may be needed in JVs hosted in China in order for foreign firms to protect themselves from misappropriation from their Chinese partner. Further research on specific host country deviations from the expected correlation could deepen our understanding of IJV governance.

This study takes absolute values in describing the degree of correspondence between equity share and board representation, which may be a limitation. However, this paper points out the factors that make JVs more likely to use the equity share formula, and where it is a good idea to examine, negotiate and tailor board representation. Further studies might explore each of these processes and determine the direction the deviation takes, i.e. which partner gets more or less board participation than equity share.

There have been a limited number of studies on the micro foundations of alliances because of the difficulty in obtaining contracts. Contract databases in past studies have been limited to biotech and pharmaceutical JVs. In this study, I use an automated program to create an unique contract database from the SEC, one of the largest repositories of worldwide US publicly traded firms. Understandably, this technique does restrict the size of the sample and it is also not possible to obtain information on some privatelyowned JV partners.

Finally, it turns out that 32 per cent of the JVs did not establish a board of directors. An interesting research avenue might investigate why certain JVs do not establish boards in the first place. Some studies have examined the creation of management committees in non-equity alliances (Reuer and Devarakonda, 2016), but no study has examined this among JVs, as it has been assumed that all JVs have boards (Cuypers *et al.*, 2017).

6. Conclusions

"Equity share is not the only determinant of control and decision power in a JV. There are other governance mechanisms that interact within this form of hybrid organizational structure. We know that boards play an important governance role within JVs, but we know little about board correspondence with equity share" (Velez-Calle, 2018, p. 114). Boards are an under-researched but a key JV governance mechanism. While there is a correlation between partner equity share and representation on the board, we do not know why this correlation is lower or higher. In this study, I confirm that there is a high correlation in the relationship but at different levels – some JVs deviate from this norm according to different factors at the contractual, transactional and host country levels. I find that IJVs tend to have a higher deviation (less correlation), while the inclusion of a contractual deadlock clause, the size of the board and the host country's rule of law are related to less deviation, meaning such factors are related to a higher correlation between equity share and board of director representation.

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