

Further Sophisticating the Relationship Between Prior JV Experience and Subsequent JV Formation: The Changing Effect of JV Experience with the Existence of Most Recent JV Failure

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In this study, I further sophisticate the relationship between JV experience and subsequent JV formation by demonstrating that past experience is not always positive in the future activities. While previous studies emphasize that JV experience generally seems to be conducive to firms' JV activities such that the greater a firm's JV experience, the more likely it will form a new JV in the future than inexperienced firm, this study provides the boundary condition by showing that JV experience can partially deter firms' subsequent JV formation with the existence of prior JV failure. In this regard, this study not only enhance our understanding of the complex nature of firms' JV activities but also provides practical implication that JV experience is not a panacea but can sometimes hamper subsequent JV formation especially when focal firm needs to innovate its current way of conducting a JV in response to recent JV failure.

Key Words: Joint-venture experience; Joint-venture failure; Joint-venture formation; Organizational capability; Event-history analysis

Introduction

Scholars in the field of management have paid considerable interests toward a cooperative Joint Venture (JV), which involves the formation of a new business entity through partners' collective investment in equity. Previous studies showed that better efficiency in governance structure (Hennart, 1988), the influence of evolving technology (Clark, 1989), and the benefit of network organizations (Miles & Snow, 1986) are part of theoretical factors for the creation of JV while, as the review of Brass et al. (2004) has shown, the transfer of partner-specific knowledge and skill, the differential access to power and resources, and the facilitating transactions among partners are three basic common findings of consequences. As management scholars have broadened and deepened this area further over the past years, later research has moved beyond the simple investigations of antecedents and/or performance consequences of it and several more sophisticated research questions emerged. The research stream on JV experience is one of them. By taking organizational capability perspectives, the research in JV experience generally seeks to understand how the value from a JV is influenced by a firm's cooperative capabilities developed through repeated experience with this governance form, and how firm's subsequent JV formation depends on these JV capabilities and experience (e.g. Anand & Khanna, 2000; Zhan & Luo, 2008; Kale et al., 2002).

By measuring JV experience as the cumulative number of prior JV in which focal firm has participated, the research has demonstrated that JV formed between partners with greater level of JV experience is more likely to have better JV performance (Delios & Beamish, 2001; Gulati et al., 2009; Hoang & Rothaermel 2005; Zollo et al., 2002) and cooperative capabilities (Mitchell et al., 1994; Kale & Singh, 2007; Barkema et al., 1997; Lyles, 1987,1988; Rothaermel & Deeds, 2006; Teng & Das, 2008). Also, previous studies demonstrate that the greater a firms' JV experience, the more likely it will start a new JV in the future than inexperienced firms in JV (Al-Laham et al., 2008; Villalonga & Mcgahan, 2005; Gulati, 1995, 1999; Madhok, 1997) because JV experience can improve the efficiency of the partner selection process and of the learning process within the JV itself (Inkpen & Dinur, 1998; Lyles, 1988). Although prior studies have significantly contributed to our understanding of the positive effect of JV experience on the firms' likelihood (and timing) of creation of new JV, they still provide us with incomplete picture of the complex relationship among them.

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In order for us to better understand the complex nature of firms' JV activities, we need to consider whether the effect of JV experience is constant on the subsequent JV formation regardless of firms' different performance outcomes of prior JV. In this study, I intentionally examine whether the firms have a prior JV failure because I argue that prior JV failure negatively moderates the relationship between JV experience and subsequent JV formation such that the positive effect of JV experience becomes weaker or even negative on the firm's subsequent JV formation with the existence of prior JV failure. In particular, I develop theoretical argument that the firms whose focal JV was failed have the opportunity to learn from their prior failure and attempt to improve or change their current ways of conducting a JV in order to reflect unsatisfying performance outcomes of prior JV. However, the firms with greater JV experience may encounter more difficulties in improving or changing their existing ways of conducting a JV in response to recent JV failure. Thus, it might be possible that even though 'firm A' has much greater JV experience than 'firm B', 'firm A' is less likely to enter into a new JV in the future especially when it has an JV failure in recent years, an intriguing phenomenon to which previous studies have paid less attentions.

In this study, based on the sample of 203 firms whose focal JVs were formed internationally during the period between 2001 and 2010 and the immediate observations on their subsequent JV activities for following 5 years, I empirically demonstrate that the existence of prior JV failure not only affects negatively to the firms' likelihood of re-entrance of JV, it can also delay the time of entrance. In addition, more interestingly, the results show that although JV experience generally influences positively to the likelihood of firms' re-entrance, its positive effect supported by prior findings becomes negative on the formation rate of new JV especially when focal firms have a prior JV failure. In this regard, this study has both theoretical and managerial implications by further sophisticating the relationship between JV experience and JV formation, establishing a more dynamic perspective and new insights on the nature of firms' behavior in entering into a new JV and, providing managers with the caveat that past experience is not always positive in the future activities and thus enabling them to take a more balanced view on the role of experience.

I firstly build a baseline (first) hypothesis which investigates the positive relationship between JV experience and subsequent JV formation such that the greater firm's JV experience, the more likely it will form a new JV subsequently. Then, I will further develop this framework by discussing negatively

moderating role of prior JV failure on this relationship. Specifically, I argue that although prior JV experience might be conducive to future JV formation in general, its positive effect becomes rather negative on subsequent JV formation especially when a firm needs to improve its way of conducting JV in response to recent JV failure. Data source, research design and analytical methodology are provided in the subsequent section followed by the discussion of measurements. Then I provide the results and finally discussions about theoretical contributions, practical implications and limitations and future research of this study are provided.

The positive effect of JV experience on subsequent JV formation (baseline hypothesis)

In many industries, firms are not only frequently involved in multiple JV simultaneously, they also engage in sequences of JV over time (Pangarkar, 2009). So, moving beyond the simple analyses of the effects of current JV in a static perspective, my first hypothesis seeks to investigate how prior JV experience affects firm's behavior to enter into a new JV in the future while an ongoing JV is still evolving.

First of all, rather than taking transaction-cost perspective which basically views each choice of JV governance in firm's history as discrete and independent event for the efficient management of transaction cost with the assumption of opportunism (e.g. Williamson, 1991), some of the prior works on JV (or governance form in general) (e.g. Madhok, 1997) were rooted in the organizational capability perspective. The most crucial feature of organizational capability perspective is that it suggests that firm tends to face strict constraints on its capabilities and thus JV activity is essentially a path-dependent incremental nature such that subsequent JV formation is a function of its current JV capabilities and routines developed through repeated experience in JV. So, it clearly emphasizes the critical role of JV experience to understanding firms' future JV formation because firms' past experiences produce the underlying capabilities and routines on the basis of which it starts subsequent actions. Based on this fundamental idea, I argue that the firms with greater JV experience are more likely to actively engage in new JV subsequently than inexperienced firm due to better JV capabilities and routines obtained from JV experience.

Firstly, firms with greater JV experience can achieve better efficiency in choosing appropriate partners for potential JV in the future. Specifically, JV experience should improve firms' capability to identify who retains what resources, whether given firm has the ability or knowledge to solve certain sets

of problems and thus who is right partner for the success of JV (Cohen & Levinthal, 1990). In other words, the firm-specific accumulated knowledge obtained from past experience in JV plays a central role in the process of partner selection because it facilitates firms to better choose potential partners (Anand & Khanna, 2000; Das & Teng, 1988; Hitt et al., 2000; Kale & Singh, 1999). Having better capability in the selection of partner, firm with greater JV experience can save the resources and time usually spent during the stage of pre-agreement partner selection and screening (Dussauge & Garrette, 1999), which could provide positive effect to the likelihood of firm starting a new JV in the future.

Secondly, by steadily learning from prior JV experience to improve their current JV routine to guide future decisions, firms with considerable JV experience can reduce the uncertainty arising from incomplete nature of inter-firm cooperation (Sampson, 2005; Anand & Khanna, 2000; Dyer & Singh, 1998). As firm can create its own specific JV-related routines from past experience, it could better deal with similar JV subsequently and the value from deploying experiential learning become more available and fast because firm can extract meaningful inference from its prior activities and encode and re-access to these inferred lessons for similar activities in the future (Levitt & March, 1988; Nelson & Winter, 1982). In other words, firms with greater level of JV experience store learning from past experience into their JV routines and they can achieve more benefits in JV by applying these established routines into similar JV in the future whenever certain stimuli are existing. With better JV routines for the efficient utilization of current resources and expertise, firm with greater JV experience can lower potential implementation cost, which consequently increase firm's tendency to start a new JV.

To sum up, because prior JV experience allows firms to establish routines fostering their learning in subsequent JV, reduces firms' uncertainty about the JV processes, leads to the development of general JV capabilities, and enables firms to identify potential partners more quickly, below I provide the baseline hypothesis.

Hypothesis 1 (baseline hypothesis): *The relationship between focal firms' JV experience and subsequent JV formation is positive such that the firms with greater level of JV experience are more likely to actively engage in new JV in the future than inexperienced firms in JV.*

The negative impact of prior JV failure to the subsequent JV formation

Prior work on JV has generally treated JV performance as an outcome variable and has examined the effects of firm, deal, and industry characteristics

on JV outcomes. However, in the second hypothesis, I conceptualize JV performance as an antecedent rather than an outcome variable and study how the performance outcome of prior JV affects future JV formation.

The second hypothesis, which argues that the existence of prior JV failure provides negative impact on the firms' likelihood of creation of new JV, mainly draws on the March's behavioral theory of the firm. Assuming that firms may learn from performance feedback and that firms may show different reactions to positive and negative outcomes as a result (March, 1981), the scholars in the Carnegie school of thought (e.g. Cyert & March, 1963) have focused on how the performance outcomes of previous activities in certain type of operation determine the firms' activities in that same type in the future. In particular, good performance outcomes may enhance firms' likelihood of continuously engaging in prior strategic activities (Miller & Chen, 1994), whereas negative outcomes may result in either improvement of current way of conducting certain activities or strategic change through exploration of new strategic alternatives. (Boeker, 1989). So, for example, firms that have performed well so far with JV activities regard recent JV as a sign of appropriate strategic decision and this reinforcement from positive feedback will lead to firms' active engagement in subsequent JV. In contrast, negative outcomes in prior JV may provide the firms with poor feedback, and cause so-called "problemistic search" in order to improve current performance or find alternative strategic options and reduce its activities in JV.

Besides, firms cannot undertake all strategic goals they plan because they face the constraints on their available resources and capabilities, implying that they need to compromise or prioritize among various options (Garriga et al., 2013). Thus, for example one strategic option such as forming a JV with partners in new market might constrain alternative strategic option such as new market entry through acquisition. In this respect, negative performance outcomes from prior JV activity may reduce relative attractiveness of JV compared to other available options and therefore tends to decrease firm's proclivity toward JV formation subsequently. Taken together, these arguments lead to my second hypothesis

Hypothesis 2: *Prior JV failure negatively impacts subsequent JV formation such that firms with prior JV failure are less likely to enter into a new JV compared to firms without prior JV failure.*

The interaction effect of JV experience and prior JV failure on the firm's subsequent JV formation

The third hypothesis predicts that JV experience, at least in the short term (1~5 years), differently affects firms' subsequent JV formation depending on whether

firms have a recent JV failure. In the previous section, I mentioned that the behavioral theory of the firm (Cyert & March, 1963) implies that JV activities in the past might provide the firm with some signal to improve their current way of conducting JV or generate new one in order to reflect performance outcomes of prior activity. In other words, in JV sequence, firms respond to their past JV and approach the next entry with more reflection on performance outcome of prior JV. The study of Chang (1996), though used in acquisition sequence cases, empirically shows that firms act in a way that conducts deliberate learnings from prior acquisition performance and reflect these learning into their future entry behavior in acquisition. Given that firm reacts to prior activities and approach the next entry with reflection on prior performance outcome, the firm without recent JV failure tends to maintain its current way of conducting a JV because it has less incentive (or obligation) to change or completely create new one for starting a new JV in the future. Besides, even if firm has an incentive to change or create new way of conducting a JV, the extent of modification may be generally not substantial. Thus, in this case, the firms with greater level of JV experience are more likely to start a new JV than inexperienced firm as my baseline hypothesis predicts. On the other hands, for the firms which have a failure in the most recent JV, I argue that JV experience can partially deter the firms' JV activities at least in the short-term so that the positive effect of JV experience becomes weaker or even negative on subsequent JV formation because I expect that the firms with greater experience in JV tend to have more difficulties than inexperienced firm in changing their current ways of conducting JV in response to recent JV failure.

In particular, although transaction-cost perspective treats each choice on JV governance in firm's history as a separate and independent event such that each time firm decides to create a JV it is assumed to choose its potential partners freely and rationally from the entire population for the minimization of transaction cost under the assumption of opportunism, prior studies (Killing, 2013; Al-Khalifa & Eggert, 1999) demonstrate that as firms' experience in JV becomes greater, they steadily constrain themselves by exhibiting relatively heavy preference to cooperate with certain set of well-known historical partners with mutual trust instead of less familiar partners. As a result, firms with greater JV experience would have stronger and more cohesive inter-firm network with current JV partners since they prefer old familiar partners, which probably results in more difficulties to changing current way of implementing a JV. Indeed, Gargiulo and Benassi (2000) suggest that ties that are too cohesive result in

network closure, making change difficult and Uzzi (1997) called it as a "Paradox of embeddedness". Once again, unlike transaction-cost perspective, organizational capability perspective views JV activity as a path-dependent incremental activity where subsequent JV formation is constrained by its current JV capabilities and routines developed through repeated experience in JV (Madhok, 1997). If current JV capabilities and routines are highly tailored to the specific inter-firm network steadily established with current historical partners, the firms with greater experience in JV cannot promptly change their current ways of conducting a JV than inexperienced firm in response to recent JV failure.

And sometimes, in order for firms to successfully change or improve their current ways of doing a JV, they need to build relationship with new partners, acquire new resources or even divest existing resources freed by prior JV failure. However, during the process of rearrangement of partners and resource in response to prior failure, the firm with greater JV experience is likely to face more severe inter-firm conflicts with existing partners due to more cohesive inter-firm network, which exacerbates the rivalry between focal firm and affected partners. To address such an issue, the firm with greater experience in JV will need to spend more times and efforts toward the new potential JV in order not to damage the trust and goodwill established with historical partners (White & Lui, 2005).

Even worse, due to the possibility of organizational inertia problem, the firms with greater JV experience might not easily re-start a JV by creating new ways of conducting a JV. Specifically, the chance of organizational inertia increases as firms gradually engage in same type of JV routines and management, making firm preferable to the most well-known and utilized ones regardless of whether they are appropriate to a given situation, thereby lowering the rate of successful organizational change (Hannan & Freeman, 1984; Amburgey et al., 1993; Baum & Singh, 1996).

In sum, if firm does not experience prior JV failure, performance outcomes of prior activity do not provide the firm with significant incentive (or obligation) to change its current way of conducting JV, thereby making the firm with greater JV experience conduct more active engagement in future JV as my baseline hypothesis predict. However, when firm has most recent JV failure, the firm with greater JV experience is less likely to promptly reflect the negative performance outcomes of prior JV due to more difficulties in changing its current way of conducting a JV and thus less likely to easily re-start a new JV at least in the short term.

Hypothesis 3: *Prior JV failure negatively moderates the relationship between JV experience and subsequent JV formation such that the positive effect of JV experience becomes weaker or even negative on the subsequent JV formation when focal firm has a prior JV failure.*

Method

Data source

The primary source of this study is from *S&P Capital IQ*. This database is one of the most comprehensive sources for empirical study on JV because it provides the life histories of focal JV (e.g., initial investment and investment exit of partners, bankruptcy of venture) as well as supplementary information relevant for focal JV activity such as partner-level (e.g., financial data for publicly traded partners), transaction-level (e.g., transaction value) and industry-level information. For the date of firms' JV activities such as new entrance, investment exit or bankruptcy, I double-checked the date information from *Lexis-Nexis* and *Dow Jones News Retrieval Service* (DJNRS), if possible. Following Villalong and McGahan (2005), I used the dates reported by Lexis-Nexis and DJNRS when discrepancies happened, otherwise used those reported by S&P Capital IQ. And I used *SDC Joint-ventures and Alliances* database to obtain cumulative number of JV in which focal firm has participated, a proxy for JV experience. For the firm-level information (e.g. age, financial data and business information) or JV-level information (e.g. whether JV was unexpectedly dissolved) I used *compustat*, *company annual report*, *publication*, and *other media sources* such as *Factiva* and *The Wall Street Journal Index*, if not found in *S&P Capital IQ*. Finally, when it comes to the financial information of private partners, I relied on *Private Company Financial Intelligence (PrivCo)* database, and even when I still could not obtain financial information of focal private partners, I instead used available financial information of one of similar private companies in the industry identified by *Bloomberg Business*, which provide similar companies lists. From these various data sources, I compiled and constructed data structure in order to be appropriate for the analyses. The following is the detailed descriptions of it.

Sample and research design

First, I extracted the initial list of JVs formed internationally between 2001 and 2010 in all industries which include at least one publicly traded firm from *S&P Capital IQ* database. This somewhat broad selection criterion yielded the set of 629 JVs.

Second, I divided the initial list of focal 629 JVs into two subgroups according to the criterion that at least one of partners exited the equity investment on focal JV or JVs terminated due to bankruptcy during

the period. The initial list was then divided into 522 JVs whose partners, all together, have retained their initial investment until the end of 2015 and 107 JVs in which at least one of partners liquidated its equity investment on focal JVs or JVs terminated due to bankruptcy during the period. In this study, following previous studies (e.g. Pangarkar, 2009; Park & Ungson, 1997), I empirically operationalized JV failure as either JV dissolutions resulting from 1) unplanned market-liquidation, 2) bankruptcy, or 3) sale to third parties. Please note that unlike liquidation and bankruptcy, sale to third-parties resulted in the continuation of business entity of focal JV. However, I did not regard the termination of JVs due to the acquisition by one of partners as a failure and omitted from the sample. The detailed rationale is provided in the following measurement section.

Third, by employing different observation techniques for each subgroup, I longitudinally observed partners' subsequent JV activities for 5 years. Specifically, when it comes to the partners whose focal JV was failed, I observed their subsequent JV activities after the announcement date of their JV failure. On the other hand, unlike subsequent activities of the partners with prior JV failure which can be easily identified because the date of focal JV failure was known, those of partners in alive focal JVs are relatively difficult to be identified because there are no simple ways regarding when we start observing the partners' subsequent JV activities if their prior (focal) JVs are still alive. For example, if we observe firms' subsequent JV activities immediately after the formation date of prior focal JV, there could be a biased systematic tendency to estimate the effect of prior JV failure to be less negative and/or even insignificant on firms' subsequent JV activities because firms are less likely to engage in another JVs immediately after the previous one due to their limited JV capabilities and relevant resources. Indeed, Al-Laham et al (2008) showed that the rate of JV formation initially decreases with the time elapsed since the most recent JV was formed and subsequently increases. Also, if we start observing subsequent JV activities, let's say, 10 years later from the date of previous focal JV formation, this way of observation also causes confounding effects because, in this case, the argument that the firms obtain proper inference from prior JV activity and then apply these into subsequent JV becomes untenable. Research shows that a very long interval between two projects hampers proper learning (Hayward, 2002; Brown & Eisenhardt, 1997). So, to decrease any confounding effect, we should observe subsequent activities of partners in alive focal JVs neither too immediately nor too lately. In this study, I decided to observe subsequent activities of partners in alive JVs 4 years later from the date of focal JV formation. Observation in this manner is also reasonable given that the average lifespan of

failed JVs was 45.7 months, which is very close to 4 years.

Forth, to further increase the internal-consistency of my study, I do not consider the firms in financial industry due to their different business model and asset structure. Unlike the firms in other industry, the firms in financial industry inherently tend to engage in more numerous equity investment in JV simultaneously with other partners and are more likely to liquidate, sell to others to realize financial investment and re-start a new equity investment subsequently, all of which confound my theoretical arguments.

Fifth, when I observe partners' re-entrance in JV, I only consider 1) creation of new JV or 2) initial entrance into existing business entity through equity-investment together with other firms as the sign of re-entrance of JVs. Therefore, partners' additional equity-investment on JV in which they had already engaged are not considered as an entrance of new JV.

Sixth, I omitted the partners that had JV failures during my 5 years observation period. Following Fowler and Schmidt (1988), I dealt with the problem of multiple-occurrence by deleting the sample of multiple-occurrence because in my data the proportion of it is only 3 percent.

After considering these six selection criteria and further omitting any samples without information required for covariates, my final sample size decreased to 203 firms, among which 79 firms has a failure in their focal JV.

Statistical model

The dependent variable in my study is the likelihood of partners forming a new JV in the future. In this regard, event history analysis is appropriate because this technique tries to calculate the probability of event (re-entrance of JV) on the basis of given observations and therefore mathematically links change in future outcomes to conditions in the past. So, the dependent variable is mathematically specified as a function of the independent variables and a set of parameters capturing the effects of the predictor variables on the occurrence or non-occurrence and timing of particular events such that $\lambda(t) = f(\beta X_t)$ (Allison, 1984). In current study, the outcome is the probability of a firm forming a new JV, as measured by the JV rate (the so-called hazard rate), and the conditions of the past observations were modelled in the set of covariates (such as whether focal firms have failure outcome in prior JV). Stata program was used to test and estimate the parameters of covariates.

In order to conduct event-history analysis, my data structure should include information about the timing and sequence of the events that are being examined

(Blossfeld et al., 2007). For instance, if focal firm in the sample re-start a new JV, my data structure should provide information about the timing of this event (day, month, year), and any other relevant JV-, firm-, and industry-level information. My data structure, therefore, provide information on changes in variables that might take place at any specific point in time during my observation period. Specifically, each firm's history began either one-day after the date of JV failure or 4 years later from the date of focal JV formation and ended at the time of an event (entering into a JV) or at the end of the year, whichever comes first. The firm's second spell began on the following day and ended at the time of an event or the end of the next following year. This pattern continued until the end of the observation period (Dec 31, 2015), allowing time-varying covariates to be updated throughout the firm's history at yearly intervals.

Measurement

Dependent variable

The dependent variable is the likelihood of firm entering into a new JV in the future. I will measure this JV formation rate, $\lambda(t)$, by observing each firm's JV activities longitudinally until the end of 2015. So, the firm's subsequent JV activities were captured during my observation period. This variable is coded 1 each time the firm has entered into a new JV and 0 otherwise. Again, when I observe partners' re-entrance in JV, I only consider 1) creation of new JV or 2) initial entrance into existing business entity through equity-investment together with other firms as the sign of re-entrance of JVs. Therefore, partners' additional equity-investment on JV in which they had already engaged are not considered as an entrance of new JV.

Independent variable

Prior JV failure –This independent variable is binary such that its value is 1 for partner firm whose focal JV has a failure and 0 otherwise. I operationally defined JV failure as a) bankruptcy, b) unplanned liquidation, or c) sale to third-parties. To ensure that termination was not previously determined by partners so that it was an unexpected event, I identified and analyzed all news reports on each terminated JV in the sample from Factiva database, which covers thousands of newspapers around the world. Following previous studies on JV failure (e.g. Park & Russo, 1996; Park & Ungson, 1997), I did not consider the case of JV termination due to the acquisition by one of partners as a failure because disagreements exist regarding whether the acquisition of a JV implies the failure of its activities, although several prior studies viewed this case as an indirect sign of failure as well (e.g. Pangarkar, 2003). Specifically, Gomez-Casseres (1989) argued that JV is sometimes an intermediate

transaction governance, implying that it is frequently succeeded by a different organizational form more suitable for changed environments. Indeed, Kogut (1991) demonstrated that JV termination due to acquisition by one of partners was associated with sudden change in industry growth and concentration. Viewing acquisition as the realization of an investment options, this interpretation suggests that JV plays a role as an insurance during corporate expansion, which minimizes the downside risk of future investments (Bowman & Hurry, 1993). In this regard, I did not include the cases of JV termination resulting from the acquisition by one of partners since the inclusion of these cases into the analyses would bias the results.

JV experience – I firstly measured JV experience by counting the cumulative number of JV in which focal firm has participated prior to the formation of focal JV and then constantly updated this variable whenever focal firms entered into a new JV during my 5 years observation period because the data structure of my study is longitudinal with time-varying covariates.

Control Variable

Number of current JV – This need to be controlled because even though firms do not have JV failure experience in the recent years, firm are still less likely to enter into a new JV due to the lack of resources and capabilities for conducting many current JV simultaneously.

Cumulative JV experience – This effect is already controlled in my analysis since it is independent variable in my model. Numerous previous studies have demonstrated that the greater the number of previous JV established by a firm, the more likely firm creates new JV in the future.

Firm performance – Firm's three years average ROA will be used to control the firm performance since the firm with better performance can receive less negative impact from JV failure and better able to afford a new JV faster than firm with low performance.

Firm size – The firm size, measured by annual revenue, should be controlled for estimating the speed and likelihood of re-entrance of JV. While some studies in support of negative effect argue that as firms increase in size, they are more associated with the resistance to change in response to learning from prior experience and thus become more rigid and inflexible (e.g. Barnett, 1997), others support opposite view by demonstrating that larger firms are more fluid due to market power which lower external barrier and resistance (Scherer & Ross, 1990), and slack resources which enable them to initiate change (Cyert & March, 1963). I took a natural logarithm for this variable for statistical analyses.

Firm age – Similar to firm size, firm age needs to be controlled as well because some prior studies show that inertial pressure increases as firm ages (Hannan & Freeman, 1984). On the other hands, other supports positive view that firms become more flexible with age (Singh et al., 1988).

Culture (Uncertainty avoidance) – Because my research collects the samples internationally, it is important to take distinctive cultural factor into account. Among the various cultural factors, my study specifically focuses on uncertainty avoidance. This is the most relevant cultural factors since the extent to which firm can endure uncertainty probably affects the firm's decision to enter into a new JV. I use Hofstede's fourth dimension for measurement.

Industry performance trend (focal firm) – Prior studies have demonstrated that firms are more likely to form an JV in prosperous industry. In this case, the formation of new JV reflects the up-ward trend in industry performance regardless of current state of each partners.

Results

Table 1. Descriptive statistics and correlation matrix

	Mean	S.D	Min	Max	1	2	3	4	5	6	7	8	9	10
1. Elapsed months	28.587	17.192	1	59	1.000									
2. Prior Failure	0.389	0.489	0	1	0.041	1.000								
3. New JV	0.078	0.268	0	1	-0.043	-0.121	1.000							
4. JV Experience	4.928	3.55	0	18	0.006	0.041	0.348	1.000						
5. Current JV	1.298	1.261	0	4	-0.133	-0.133	0.258	0.672	1.000					
6. Firm ROA	7.787	18.101	0.013	282.510	-0.101	-0.014	-0.053	-0.108	-0.129	1.000				
7. Firm Size	6.362	3.064	-3.576	13.678	0.014	-0.067	0.229	0.449	0.352	-0.034	1.000			
8. Firm Age	55.457	43.414	2	182	0.021	0.014	0.092	0.261	0.146	-0.098	0.369	1.000		
9. Industry ROA	3.859	1.845	-0.9	8	-0.071	-0.021	-0.008	0.017	-0.011	0.106	0.040	0.023	1.000	
10. Culture	59.334	22.244	8	99	0.011	0.015	0.079	0.149	0.078	-0.115	0.298	0.256	-0.046	1.000

Table 1 is a descriptive statistics and correlation matrix of the covariates. Before I analyze this table, however, I need to mention that since the data structure in this study is cross-sectional time series (panel data), the number of subjects used for calculation of mean, S.D, min, max and correlation is 1,015 (N=1,015). These 1,015 subjects were generated because I observed each firm’s behavior of subsequent JV activities and relevant covariates for following 5 years (203 firms * 5 years = 1,015 subjects). During 5-years observation period, the sample firms, on average, had an JV experience with

1.653 prior JVs and was currently conducting 1.605 JVs, respectively. Next, when we see the correlations, prior failure is negatively correlated with new JV (this variable was coded 1 whenever firm created a new JV during the observation period and 0 otherwise), which preliminarily supports my second hypothesis that firms with a negative performance outcome in prior JV are less likely to enter into a new JV. The matrix shows no substantial problem with multicollinearity problem among the covariates except the relationship between JV experience and current JV.

Table 2. Comparison between group 1 (PF=1) and group 2 (PF=0)

	Elapsed months	New JV	JV experience	Current JV	Firm ROA	Size	Age	Industry ROA	Culture
PF=1	37.2	0.038	2.07	0.81	7.47	6.1	56.19	3.81	59.75
PF=0	23.1	0.104	6.75	1.61	7.99	6.53	54.99	3.89	59.07

Next, I divide the sample into two groups according to the existence of JV failure and seek to compare these two groups based on elapsed months until creation of new JV, proportion of new JV and other firm-related control variables.

Firstly, the most significant difference between two groups is the level of JV experience measured by the cumulative number of prior JV activities. From the comparison, we can infer that as the firm has more prior experience in JV,

Table 3. Results of cox proportional hazard model

	Model 1 (Full sample)		Model 2 (Full sample)		Model 3 (Full sample)		Model 4 (PF=0)		Model 5 (PF=1)	
	Hazard Ratio	P value (t-test)	Hazard Ratio	P value (t-test)	Hazard Ratio	P value (t-test)	Hazard Ratio	P value (t-test)	Hazard Ratio	P value (t-test)
Prior Failure (PF)			0.327 (0.112)	0.001	15.842 (9.591)	0.000				
JV Experience (JE)	1.392 (0.183)	0.012	1.513 (0.195)	0.001	1.977 (0.286)	0.000	1.770 (0.269)	0.000	0.406 (0.198)	0.066
PF*JE					0.117 (0.049)	0.000				
Current Alliances	1.263 (0.188)	0.117	1.201 (0.177)	0.215	1.381 (0.235)	0.058	1.862 (0.364)	0.001	0.060 (0.052)	0.001
Firm ROA	0.985 (0.260)	0.587	0.978 (0.027)	0.440	0.964 (0.032)	0.273	0.978 (0.032)	0.492	0.800 (0.092)	0.053
Firm Size	1.241 (0.095)	0.005	1.178 (0.091)	0.031	1.102 (0.084)	0.200	1.019 (0.082)	0.806	1.311 (0.261)	0.174
Firm Age	1.001 (0.003)	0.724	1.002 (0.003)	0.645	1.004 (0.004)	0.218	1.007 (0.004)	0.133	0.985 (0.011)	0.184
Industry ROA	0.935 (0.074)	0.402	0.945 (0.077)	0.496	0.972 (0.083)	0.748	0.902 (0.095)	0.331	0.925 (0.171)	0.674
Culture	0.999 (0.007)	0.974	1.002 (0.007)	0.862	0.998 (0.007)	0.772	0.994 (0.008)	0.532	1.006 (0.019)	0.749
Log Likelihood	-227.677		-221.668		-198.227		-127.129		-32.884	
Chi-square	65.59***		77.60***		124.49***		94.41***		41.71***	
Number of firm years	1,015		1,015		1,015		620		395	

All significance tests are two-tailed † < 0.10, * < 0.50, ** < 0.01, *** < 0.001; standard errors are in parentheses.

it has less likelihood of JV failure. Besides, we can easily know that the likelihood of firms with prior failure (PF=1) entering into a new JV in the future is much smaller than that of firms without prior failure (PF=0). Specifically, during observation period, 10 out of 100 firms (0.104) in the group of PF=0 formed a new JV again while only 3.8 out of 100 firms (0.038) with PF=1 engaged in new JV subsequently. Furthermore, even when the firm with prior failure enter into a new JV in the future, its elapsed time is 37.2 months on average, which is longer than 23.1 months for the firms without prior failure. In other words, prior failure not only provides negative impact on the subsequent formation of JV, it can also delay the time of re-entrance.

The table 3 shows the results of cox proportional hazard model. Please note that hazard rate is the probability of future changes in the dependent variables per unit of time (here the probability that firm enters into a new JV per unit of time). And hazard ratio in the first column of each model represents an increase in the hazard rate per unit increase of covariate. For example, if hazard ratio of a certain variable is 2.51, then the likelihood of event occurrence becomes 2.51 times greater per unit increase of that variable. On the other hands, if estimated hazard ratio is less than 1, that variable has a negative impact on the occurrence of event.

Model 1 tests a baseline hypothesis (hypothesis 1), which argues that JV experience provides positive impact on the firms' likelihood of starting a new JV. Overall fit of model is highly significant with Chi-square of 65.59 at 6 degree of freedom. The estimated hazard ratio of JV experience is 1.392 with its p-value being 0.012. In other words, the result supports the first hypothesis implying that the more JV experiences the firm has, the more likely it will enter into a new JV in the future than inexperienced firms in JV.

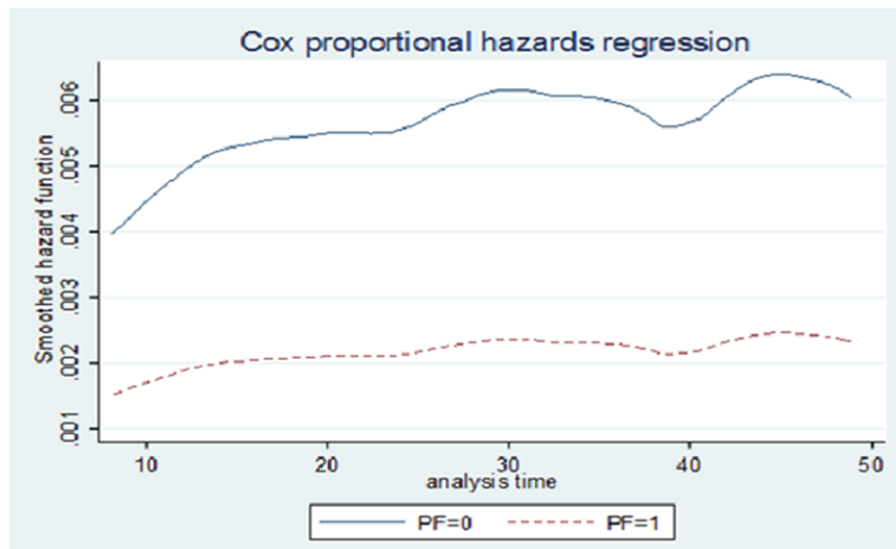
The main factor of this study, prior failure (PF), is added into model 2 for testing second hypothesis. By putting PF variable into an estimation model, both log-likelihood (-221.668) and Chi-square (77.60) increase significantly. From the table, hypothesis 2 is strongly supported with the p-value of PF being 0.001. As expected, its estimated hazard ratio is less than 1,

meaning that if the firm has a prior JV failure (PF=1), its probability that the firm will start a new JV during my 5 years observation period is 0.327 times less than that of firm without prior JV failure. This can be visually represented by plotting two different hazard rates, respectively, based on whether firm has prior failure or not. Graph 1 is the plot of two different hazard rate, $r(t)$, whose unit of analysis time is month. From this graph, we can see that throughout the entire observation period, the hazard rate, which is the probability of firm entering into a new JV per unit of time at time= t , is much smaller (almost 3 times) when firms have a prior failure. Also, negative impact of prior failure on the firms' subsequent JV formation seems not to be diminishing given that the hazard rate difference between two subgroups does not get smaller for entire observation period.

Lastly, to test third hypothesis, I inserted the interaction term between prior failure and JV experience (PF * JE) into the model 3. The estimated hazard ratio of interaction term is highly significant and is less than 1, which implies that prior JV failure negatively moderates the relationship between JV experience and JV formation. To further investigate, I divided the entire sample into two subgroups based on whether firms have a prior JV failure and then conducted survival analysis separately for each subgroup. Model 4 is the analysis for the subsequent JV behavior of firms whose focal JV are still alive by the end of 2015 (right-censored) so that defined as having no prior JV failure in this study. In model 4, the estimated hazard ratio of JV experience is

1.770 with p-value even less than 0.001. On the other hands, model 5 is the survival analysis for the firms whose focal JV were failed. In model 5, the estimated hazard ratio of JV experience is 0.406 with p-value being 0.066. In other words, while the positive effect of JV experience to the firm's subsequent JV formation is statistically significant for the firm without prior JV failure (model 4), its positive effect becomes rather negative to the JV formation for the firms with prior JV failure (model 5). So, the result also supports the hypothesis 3, which argues that the JV experience might deter, at least in the short-term, the firms' subsequent JV activities with the existence of prior JV failure.

Figure 1. Plot of differential hazard rates



Discussion

Prior studies on corporate JV have examined how firms' subsequent JV activities are influenced by JV capabilities and experience. By taking organizational capability perspective, the research in JV experience generally suggests that the greater a firms' JV experience, the more likely that it will create a new JV in the future than inexperienced firms. Although these prior findings have significantly contributed to our understanding about the positive effect of JV experience on the firms' JV formation, these studies still provide us with incomplete picture of the complex relationships among them. Focusing on 203 firms whose focal JV were formed during the period between 2001 and 2010 and observing their subsequent JV activities for 5 years either after the date of JV failure or after 4 years from the date of formation of focal JV, this study proceeds further by showing that failure outcome of prior JV negatively affects subsequent JV activities and that positive effect of JV experience becomes negative on the firms' likelihood of re-entrance of JV at least in the short-term when they have a prior JV failure.

Contributions

The findings of present study make several contributions to the literature on corporate JV. Firstly, this study further sophisticates the relationship between JV experience and subsequent JV formation by demonstrating that experience effects are not always positive regardless of different performance outcomes of prior JV, thereby implying the need for contingency on the relationship between JV experience and subsequent JV formation. Although the present study also found the result consistent with

the previous studies that JV experience provides positive influence to the firms' subsequent JV formation in general, this study, however, shows that JV experience is not a panacea but can sometimes hamper firms' JV activities at least in the short-term especially when focal firms have a failure in the most recent JV. As Barkema and Schijven (2008) critique, whereas early researches on experience in a strategic setting with the implicit assumption that experience is always positive emphasized that JV experience generally seems to be conducive to firms' subsequent JV formation, this study proceeds further by providing a boundary condition regarding when JV experience supports JV activities and when it does not.

The study also contributes to the understanding of the effects of prior failure experience in a sequence of JV. In particular, this study complements the work of Pangarkar (2009) which also focused on the effect of prior JV failure to the future JV outcome. Based on the argument that prior terminations enable firms to design better JV and adopt more appropriate JV management strategies to avoid future terminations, his study reveals that firms that have experienced prior terminations are less likely to have their future JV terminated. In this respect, the present study complements his work by demonstrating additional effects that prior JV failure not only provides negative impact on the firms' likelihood of re-entrance of JV in the future, it can also delay the time of entrance when it starts a new JV. Strongly assuming that failed prior activities might provide the firms with certain impacts different from those of not-failed ones, this study attempts to explain how failed prior JV distinctively influence future JV behavior. In this study, in particular, I argue that failure experience plays central roles in providing firms with opportunities to learn

something new and thus improve or change their existing way of conducting JV. Indeed, as Finkelstein and Haleblian (2002) argues, prior experience on failed case may create valuable learning opportunities that can enhance the overall program-level performance via improved JV-related capabilities more than its direct negative influence on performance.

Thirdly, this study goes beyond the static perspective adopted numerous by prior studies on corporate JV, which has focused primarily on JV performance as an outcome variable and has examined the effects of firm (e.g. Chen, 2004), partners (e.g. Arya & Lin, 2007), and deal (e.g. Lee & Cavusgil, 2006) characteristics on JV outcomes, which is one of the reasons why relatively less attention has been paid to the longitudinal studies on corporate JV. However, in this study, by observing the life-histories of focal JV and subsequent JV activities of their partners, I conceptualized JV performance as an antecedent rather than an outcome variable and studied the influence of performance outcome of prior JV on future JV formation with a more JV sequence perspective. Thus, this study provides a more dynamic perspective and new insights about the nature of firms' behavior to form a new JV. In addition, this study provides further impetus for empirical studies on corporate JV based on panel data and event-history analysis, which is more appropriate research methodological approach when it comes to studying how prior JV performance affects subsequent JV outcomes and formation.

Managerial implication

The study has mainly two managerial implications. Firstly, the findings suggest that managers need to be cautious about the notion that past experience is always positive in the future activities. Although experience on prior JV can provide various benefits to the firms when starting a new JV such as better capabilities in partner selection or efficient routines for JV management, it might also hamper JV formation especially when firms need to innovate their current ways of conducting JV in response to recent JV failures. So, JV managers should consider any potential negative consequences such as inertia and/or competency trap arising from established JV routines or rigidly-embedded inter-firm collaboration networks. This consideration will help JV managers take a more balanced and comprehensive view on the roles of experience and create more dynamic and flexible JV-related routines, procedure or capabilities and ultimately achieve greater value from JV.

Secondly, the finding that firms whose focal JV was failed are more reluctant to form a new JV

provides the implication that JV managers may need to observe potential partners' JV history to predict the partner firm's likelihood to engage in new JV. For example, firm may need to spend more amounts of initial efforts and resources for the successful establishment of cooperative relationship if they pursue a JV with partners whose latest prior JV was failed. The consideration of potential partner's prior JV activities in addition to traditional resource-based and transaction-cost perspective, thus, enables managers to economize on required resources and efforts in initiating JV and lead to better appreciation of the value of given JV with specific potential partner. Thus, managers should go beyond the mere examination of the existence of partners' prior JV experience and also consider whether potential partner has a negative outcome in recent JV because the performance feedback from prior activities should also have an impact on future behaviors (Greve, 2003; Levitt & March, 1988).

Limitations and future research

Despite its merit, I acknowledge that there are several limitations that also hold promise for future works. One limitation is about the sample used in this study. In particular, the present study focused only on JV, which encounters the problem of generalizability of the findings toward other numerous types of inter-firm collaboration. Due to the nature of research questions addressed in this study, the life-histories of JV as well as firms' subsequent JV activities should be known for testing hypotheses. However, other types of cooperation such as licensing, marketing consortia, franchising, or legal contract frequently do not entail separate legal entities such that researchers have great difficulties, if not impossible, to identifying the start and end date of them as well as firms' sequencing activities in those specific types of cooperation. However, given that the extent of strength of relationship for the initiation of cooperation is generally greatest in the case of JV (Contractor & Lorange, 1988), focal firms' subsequent cooperative activities could show somewhat different results when we investigate other less-requiring types of cooperation, which has research potential for future studies.

Second limitation is concerned about an indirect measurement of JV performance. Due to the fact that it is sometimes inappropriate to measure JV performance with financial outcomes and, in most case, such measures simply don't exist (Gulati, 1998), assessment of JV failure in terms of unplanned liquidation, bankruptcy, or sale to third-parties is an established approach in empirical studies on the performance of JV (e.g. Park & Russo, 1996; Park & Ungson, 1997; Pangarkar, 2009). Nevertheless, this

approach is still indirect measurement for the JV performance. Therefore, future researches should go beyond the initial efforts and adopt detailed surveys or careful fieldwork that could directly measure JV performance. So, using both archival and survey data with performance measured both by survival of the JV and by participants' assessment of performance should be considered as an empirical approach to measuring JV performance in the future research. For instance, in addition to archival data for indirect measurement, extensive surveys to the individual managers responsible for the JV enables the collection of a host of measures, subjective and objective, on which performance can be assessed.

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