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Race to Learn: Knowledge Characteristics and Resource Structure

Chandan Acharya

CUNY College of Staten Island

Isabel Rechberg

CUNY College of Staten Island

Xiaodan Dong

Arizona State University at the Tempe Campus

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Race to Learn: Knowledge Characteristics and Resource Structure

Abstract

Purpose

This paper studies the impact of the interactive effect of knowledge characteristics – tacitness, specificity and availability— and resource structure —complementarily and asymmetric—on learning race behavior among International Joint Venture (IJV) partners in China.

Design/methodology/approach

Preliminary in-depth interviews with three IJV managers were conducted to develop and evaluate the tentatively developed questionnaire. The finalized survey questionnaire was distributed to middle and top-level managers of IJVs, resulting in a total of 124 usable surveys. The psychometric properties of data were evaluated using Cronbach's alpha and confirmatory factor analysis, and hypotheses were tested using a Generalized Linear Model.

Findings

The results show that partners in IJV have low tendencies to acquire tacit and specific knowledge, but, when the resource is complementary, it stimulates the learning race. Also, when resources are asymmetric, IJV partners engage in the learning race more aggressively, particularly for highly specific knowledge. The situation reverses for highly available knowledge.

Research/practical implications

The findings provide important insights for both researchers and managers on knowledge characteristics and resource structure influencing learning race behavior. This insight allows firms to leverage features of knowledge and resource conditions to prevent or facilitate the learning race for either common or private interests.

Keywords: IJV, knowledge characteristics, learning race, resource structure

Introduction

International joint ventures (IJV) are the common vehicle used to enter international markets. Through IJV, knowledge and resource are acquired and risks mitigated, as two or more businesses with varying sets of know-how partner with a collaborative intent for a set period (Dong, Zou, Sun, & Zhang, 2019; Kwon, 2008; Park & Vertinsky, 2016). In previous studies, it is highlighted that learning in the IJV relationship is fraught with obstacles where a competitive intent dominates the relationship. Firms are eager to learn each other's key competencies, such as superior customer skills and collaborative skills (Hamel, 1991; Howard, Steensma, Lyles & Dhanaraj, 2016). Where 'knowledge is power' tension arises between local partners seeking to learn and foreign partners trying to protect valuable knowledge (Jordan & Lowe, 2004; Kale, Singh & Perlmutter, 2000; Rechberg, 2018). The opportunistic behavior of partners seeking to outlearn each other, is called the 'learning race' and will be the focus of this study (Hamel, 1991; Khanna, Gulati & Nohria, 1998).

Inkpen and Beamish, (1997) present that the motivation to outlearn partner at a quicker pace arises from a firm's desire to gain more bargaining power and independence from the partner. The principle of learning race is grounded in the resource dependency theory (RDT; Pfeffer & Salancik, 1978) – a firm acquiring valuable resources of another firm will shift the balance of power in its favor (McKinley & Mone, 2003). RDT helps to explain why learning race (de)escalates when different combinations of knowledge characteristics (independent variables) and resource asymmetry (moderating variables) are present. Drawing on RDT, we include resource complementarity and resource asymmetry as contextual variables, which enables us to not only identify which type of

knowledge is sought and transferred in IJV, by *why* competitive learning in IJV occurs. For instance, the interaction of tacit and complementary expertise creates a unique resource bundle (Yao et al., 2013), escalating learning race even though tacit knowledge is difficult to copy. On the other hand, the interaction between knowledge availability and resource complementarity reduces the learning race, although making knowledge widely available allows partners to copy such knowledge easily. The understanding of such intricate relationships and the underlying reasons are possible only by taking the IJV resource structures into account.

Researchers have examined the mechanism of learning behavior in IJV (Dhanaraj et al., 2004), the impact of such learning behavior on IJV performance (Park et al., 2015; Sarkar et al., 2001; Dong et al., 2019), and the relationship between knowledge characteristics and learning behavior (Yao et al., 2013; Hau & Evangelista, 2007; Kwok et al., 2019; Ireland, Hitt, & Vaidyanath, 2002). To the best of our knowledge, no studies examine the factors that contribute to the learning race in IJV. For this reason, we analyze the antecedents that cause learning race behavior of 124 IJVs in China by addressing how knowledge characteristics and resource structures can leverage or obstruct learning race behavior among partnering firms. We hope that our findings inform practitioners that partner in IJV, and scholars about the ease with which knowledge may be copied, and the benefits for pursuing to race to learn.

Theoretical Background

IJV learning race

Learning race refers to the intent of an organization in an IJV to outlearn its partner by lowering knowledge transparency and acquiring partner's knowledge at a quicker pace

(Hamel 1991; Larsson et al., 1998). Even those firms that initially had no intent to gain knowledge of a partnering firm may later reassess their strategy (Dong et al., 2019; Inkpen, 2000). In pursuit of independence, IJV partners' desire to learn from each other may escalate over time. Inkpen and Beamish (1997, p. 177) termed this phenomenon of learning from each other competitively the "race to learn."

In competitive learning, a partner seeks to acquire another's knowledge rather than collaborate for mutual learning. Outlearning the partner enables implementing new skills and functions without the support of the partner. As the relationship dependency gets reduced, the bargaining power shifts (Hamel 1991; Inkpen & Beamish, 1997). Since each partner is motivated to maximize its relative power by gaining more knowledge than it gives, the IJV thrusts into a competitive learning race (Inkpen & Beamish, 1997; Tsang, 2002). Once a firm in alliance outlearns its counterpart, its dependency on the other will diminish. The newly acquired knowledge will allow the organization to provide services or create products independently of the other.

Here we theorize that knowledge characteristics may significantly impact firms' ability to engage in a learning race (Hau & Evangelista, 2007; Evangelista & Hau, 2009). Merely having accessibility to a partner's specific knowledge does not ensure knowledge acquisition. The ability to absorb a partner firm's knowledge and relationship with the partnering firm also determines the effectiveness of knowledge transfer (Inkpen, 2000). We examine if interactions between knowledge dimensions and resource structure facilitate or hinder learning race in IJV. Specifically, we study three aspects of knowledge: 1) tacitness, 2) specificity, and 3) availability. We further explore the moderating role of the resource structure, which are resource complementarity and

resource asymmetry, on the relationship between knowledge characteristics and learning race.

Resource dependence theory (RDT)

RDT characterizes corporations as open systems facing environmental uncertainties.

Entering into an alliance helps firms gain access to valuable and complementary resources that are difficult to replicate yet critical to address environmental uncertainties (Das & Teng, 2000; Hillman, Withers, & Collins, 2009; Pfeffer & Salancik, 1978). In emerging markets, a local firm may provide knowledge about government relations, local legislation and consumer behavior, whereas the foreign firm may provide managerial and technological expertise (Kim, Chiou, & Calantone, 2018; Piaskowska, Nadolska, & Barkema, 2017; Sharp & Barz, 1997). When a foreign firm does not have sufficient resources or information to enter into an international market, establishing an IJV can help that firm access such necessary resources, reducing uncertainty (Eisenhardt & Schoonhoven 1996).

RDT presents that inter-partner relations enable dependency on other firms' resources (Pfeffer & Salancik, 1978). In putting forward 'the matching rule', RDT suggests that partner's resources need to match the local firm's specific resource needs (Hillman, Cannella & Paetzold, 2000; Pfeffer, 1972). Some of the specific resources partner firms may seek to acquire are regulatory support, market access, legitimacy, physical assets information, and human capital (Hillman et al., 2009).

While RDT in alliance suggests that learning from a partner reduces future dependency, such learning, if cooperative, may also develop trust among the partners (Inkpen & Currall, 2004). When partners make their knowledge accessible to one

another, it increases interactions, ensures knowledge sharing, and creates a sense of familiarity (Koka & Prescott, 2002). Repeated and successful interactions among partners will allow for mutual learning, increasing the trustworthiness in the relationship (Inkpen & Currall, 2004). The positive effect of knowledge availability spirals upward to creating cooperative learning among alliance partners (Mellat-Parast & Digman, 2008).

Hypotheses

Knowledge tacitness and resource asymmetry

Research on knowledge transfer suggests that explicit knowledge plays a critical role in facilitating a learning race (Hoetker & Agarwal, 2007). Templates, as well as vision, mission, goals, and objectives, if written and codified, are easily acquired (Lyles & Salk, 2007). In contrast, tacit knowledge, often more valuable, is more challenging to transfer among partners (Lyles & Salak, 2007; Rechberg & Syed, 2013). The inherent nature of tacit knowledge is that it is embedded in people's consciousness and difficult to articulate (Polanyi, 1962). Organizational tacit knowledge is stored in a team's norms, values, and beliefs that evolve through continuous learning (Chou, 2005; Dong, Bartol, Zhang, & Li, 2017; Leonard & Sensiper, 1998). As organizational culture continuously evolves, it becomes more difficult for firms to retrace all the steps related to the development of cultural norms.

Tacit knowledge is causally ambiguous and challenging to understand and codify (Chuang, Jackson & Jiang, 2016; Rechberg & Syed, 2014; Szulanski, 1996). To copy tacit knowledge, the rival firm needs to comprehend all underlying cause-effect relationships and find ways to apply that knowledge to their setting (Røvik, 2016). The presence of cause-effect ambiguity creates a barrier to the imitation of knowledge by a

partnering firm, thereby depressing the learning race (Barney, 1991; Brookes, 2014; Uygur, 2013). For example, during a tour to New United Motor Manufacturing Inc. (NUMMI), an alliance between Toyota and General Motors (GM), GM managers were amazed to witness only a small number of defects in products. The high-quality operational system of the NUMMI was responsible for generating superior products. Although such standard of NUMMI was conspicuous, the underlying rationale was challenging to communicate, and therefore, difficult for GM to internalize (Inkpen, 2000).

Partnering firms may not see immediate value in learning tacit knowledge. Explicit and objective knowledge is visible, uncomplicated to acquire, and has immediate value (Inkpen & Dinur, 1998). For instance, in American based-joint venture between American and Japanese firms, the American firm discounts the importance of product quality knowledge of its Japanese counterpart, resisting to acquire such knowledge, stating that it would never work in the U.S. (Inkpen & Dinur, 1998). Tacit knowledge may, therefore, depress the learning race among IJV partners.

Additionally, where resource asymmetry is present, the relationship between knowledge tacitness and learning race is moderate (Makhija & Ganesh, 1997). Resource asymmetry refers to the imbalance and discrepancy of resources shared by partners in IJV alliance. When tangible resource contribution in IJV is asymmetric, it will likely yield the firm with the majority of equity a bargaining power. Indeed, Makhija and Ganesh (1997) argue that the firm with more resources can maintain a dominant position in a joint venture by developing control mechanisms such as contracts, rules and regulations, and limiting transparency, preventing the effective transfer of knowledge (Hamel, 1991). The

greater contribution of product and market knowledge in IJV increases the decision-making power on how to utilize resources. Therefore, a partner may seek to maintain resource asymmetry to retain bargaining power (Lee, Chen, & Kao, 2003).

The willingness to learn and the extent of the knowledge gap between partners may matter. Minbaeva et al. (2018) find that the capacity to race to learn depends on the attitude of receptivity, and if the knowledge gap is too big, the intent to acquire knowledge may not ensure knowledge transfer (Cohen & Levinthal, 1990). In that essence, higher resource asymmetry may depress the learning race. We, therefore, hypothesize that:

H1. When resource asymmetry among partners is high, the local IJV partner commits less to the learning race in knowledge acquisition, when knowledge is highly tacit.

Knowledge tacitness and resource complementarity

Complementary knowledge refers to the level of resource interdependence in the IJV relationship where partners value the contribution of each other experience as necessary to accomplish goals and responsibilities. Complementary knowledge may amplify the learning race between IJV partners as acquiring it can change the balance of power (Inkpen & Beamish, 1997). After receiving sufficient complementary knowledge, the faster learning partner's dependency on the IJV reduces. In contrast to overlapping resources, complementary resources may expand the repertoire of a firm's knowledge repository facilitating innovation (Cohen & Levinthal, 1990; Shenkar & Li, 1999).

Shenkar and Li (1999) found evidence that local IJV partners are likely to seek knowledge that complements, rather than overlaps, with their current knowledge base.

In IJV, tacit knowledge is more valuable to enhancing performance than explicit information (Anh et al., 2006). When tacit knowledge is also complementary, the value of such knowledge significantly increases because acquiring complementary knowledge helps to create a unique resource bundle (Yao et al., 2013) that yields a competitive advantage to both the firms in IJV (Anh et al., 2006). Yet, an organization's ability to learn additional tacit knowledge depends on their absorptive capacity (see, e.g., Anh et al., 2006; Kostopoulos et al., 2011, Lane, Salk, & Lyles, 2001; Minbaeva et al., 2003). Learning intent also determines whether or not a partner in IJV can acquire tacit knowledge (Hau & Evangelista, 2007). When partners recognize the value of tacit and complementary knowledge, partners will invest in training and development activities that foster the acquisition of such knowledge (Anh et al., 2006; Hau & Evangelista, 2007), for this reason, we hypothesize:

H2: When resource complementary among partner is high, the local IJV partner commits more to the learning race in knowledge acquisition, when knowledge is highly tacit.

Knowledge specificity and resource asymmetry

Knowledge specificity refers to the knowledge of IJV partners that is specific to a particular functional area, formalized, and separated from other experiences. Knowledge specificity could alleviate the causal ambiguity of knowledge and reduce complexity. Complex knowledge has a higher degree of interrelated components, making it difficult to understand (Winter, 1987). In contrast, specific knowledge may only require an understanding of one or a few components (Hansen, 1999). Sequential processes of accomplishing a task are often codified in a step-by-step process allowing IJV partners to identify what has to be conducted (cause) to achieve a particular result (effect). The

practice of delineating processes in a step-by-step fashion helps to reduce knowledge tacitness, thereby creating a condition that is supportive of knowledge transfer and, therefore, the learning race (Balconi, 2002; Cowan & Foray, 1997; Szulanski, 1996).

One of the primary reasons for firms to enter into an IJV relationship is to acquire knowledge of a relational partner (Inkpen & Beamish, 1997), and an alliance is an option of gaining access to partners' expertise and skills (Anh et al., 2006; Hamel, 1991). A high degree of asymmetric resource commitment by IJV partners reinforces this concept. By contributing the majority of resources to the IJV, a partner will have more bargaining power (Inkpen & Beamish, 1997; Mjoen & Tallman, 1997), maintaining control over the alliance activities (Mjoen & Tallman, 1997). To avoid the dominant control of a foreign firm over a local firm, a local government may intervene to limit the equity ownership of an international firm, as in the case of China before its entering into World Trade Organization at the end of 2001 (Lee, Chen & Kao, 2003). But when such government regulation is not in place, the local partner may try to shift the bargaining power in its favor by involving in a learning race, as more knowledge resources ensure greater control over the IJV in future (Fagre & Wells, 1982; Inkpen & Beamish, 1997).

H3. When resource asymmetry among partners is high, the local IJV partner commits more to the learning race in knowledge acquisition, when knowledge is highly specific.

Knowledge specificity and resource complementarity

As organizations in IJV identify learning from their partner as a source to reduce resource dependency, the learning race may occur only in specific areas that provide IJV partners with the strategic control over complementary resources and activities (Mjoen & Tallman, 1997). Such resources may be related to technology, marketing and distribution,

and skills and expertise required to cater to market needs (Yan & Gray, 1994). When the complementary knowledge from the partner combines with the expertise of the local firm, it will result in the unique resource bundle (Yao et al., 2013). The possession of unique resources may not only reduce the local firm's resource dependency over the foreign firm but also be the source of competitive advantage in its domestic market (Anh et al., 2006), independent of the partner firm. For this reason, we hypothesize:

H4. When resource complementarity among partner is high, the local IJV partner commits more to the learning race in knowledge acquisition, when the knowledge is highly specific.

Knowledge availability and resource asymmetry

A high level of knowledge availability means that there is a minimal barrier for firms in IJV to learn from each other (Yan & Gray, 1994). Partners are willing to share available knowledge (Minbaeva et al., 2018) by encouraging the transfer of personnel between IJV organizations (Inkpen, 2000). In an empirical study based on the data obtained from 219 IJV in Vietnam, Hau and Evangelista (2007) found that the foreign partners aiding local partners through training and development enhances the ability to acquire explicit knowledge. The accessibility of expertise also helps to foster trust among relational partners. Where partners engage in developing relational capital conducive to creating a favorable learning environment, employees from one organization have free access to another's knowledge (Park, 2011a). Yet to enable this essential element of knowledge exchange, reciprocity in knowledge sharing among partners is necessary (Magnini, 2008; Rechberg, 2018).

The presence of resource asymmetry indicates a discrepancy in IJV partners' resource contribution (Lee et al., 2003). When partners' resources are complementary, and both partners comply with the norms of reciprocity, both partners may contribute equally to the IJV (Kwok et al., 2018). Therefore, there may be less motivation from either party to hide knowledge or question other's intent to engage in collaborative learning. On the other hand, in the case of resource asymmetry, the continued willingness to make knowledge available to partner to maintain symbiotic knowledge exchange could be diminished as partners eye on increasing their bargaining power at the expense of the other by involving in learning race behavior. We therefore theorize:

H5. When resource asymmetry among partners is low, the local IJV partner commits more to the learning race in knowledge acquisition, when the knowledge is highly available.

Knowledge availability and resource complementarity

One of the primary motives of the partners in IJV is to reduce the dependency over the partnering firm and gain the upper hand in bargaining by learning (Steensma & Lyles, 2000). To that end, acquiring highly available knowledge plays a critical role. As discussed, the complementary expertise of partners combined with the local knowledge base yields higher value. Acquiring partners' knowledge may not only enhance the value of one's experience but may result in an unrivaled resource bundle, which may be a source of competitive advantage (Amit & Schoemaker, 1993; Hamel, 1991). Since there may be the incentive for partners to learn complementary knowledge, and the availability of knowledge may facilitate such learning, we hypothesize that:

H6. When resource complementarity among partner is high, the local IJV partner commits more to the learning race in knowledge acquisition, when the knowledge is highly available.

Insert Figure 1 Here

Method

The motivation to research equity-based IJVs in China is that broad diversity of foreign investors and a dynamic environment have provided a rich research setting. Both Chinese and international partners are highly motivated to learn from and with each other in this fast-changing market (Guthrie, 2005). It is widely recognized that most foreign firms and local Chinese firms enter into equity joint ventures to gain access to each other's knowledge (Luo, 2000). For example, local Chinese partners seek foreign partners' proprietary technology and management know-how. In contrast, foreign partners are interested in local partners' resources in marketing, distribution channels, and the relationships with the local government. Second, the nature of resource endowment in equity joint ventures in China provides an excellent context to study IJV learning. Many foreign companies entered China in the form of an IJV to reduce risks and uncertainty, mostly due to cultural differences, distribution networks, political systems, and market dynamism. These companies find it challenging to survive in that environment without the help of a local partner. The resource endowment of both domestic and foreign firms allows us to scrutinize how the differences in their resources will impact the learning mechanism between them. Third, because of the unstable institutional environment and high risks associated with international partners, some firms take IJVs as a short-term solution to gain market advantage, with makes IJVs more unstable (Luo, 2000) setting

the base for this study. In general, the setting in China offers all the factors that are important to study the learning race, and it has a high generalizable value for international management strategy, where cultures, logistics, political systems, and market features are different.

Data collection

Preliminary in-depth interviews with three IJV managers were conducted to develop and evaluate the tentatively developed questionnaire. We asked questions about their learning motivation, resource conditions, and knowledge characteristics for competitive learning. The interviews helped the researchers to explore the relationships between resource condition, knowledge characteristics, and learning race. We also had discussions on the measurement scale with professors with expertise in international marketing from the local universities that participated in this study. The survey questionnaire was initially developed in English, then translated into Chinese for data collection and back into English for validity check and data analysis. We discussed the clarity, validity, and feasibility of the questionnaire with a total of six bilingual scholars and professionals.

Three criteria were used to collect the data: 1) the firm had to be in an IJV with at least one partner from a foreign country, 2) the IJV had employees from both parent firms physically present, and 3) the local firm had more than 30 employees.

We used convenience sampling and collected data from middle and top-level managers of IJVs, who were also part-time MBA students or MBA alumni from three Chinese universities. Each university had a contact person who handled the data collection process. The contact person handed out the survey at the end of their class and collected the surveys at the beginning of class the following week. One school also

contacted MBA alumni via phone calls, which requested their consent for the survey study and emailed the questionnaire. For those who did not send the survey back, a second wave of phone calls and emails were made to remind them. The overall response rate was 51.3%, and 124 surveys were useable.

The assessment of potential response bias was done by making the comparison between the early response and the late response, current students and alumni, as well as comparing responses between the three universities (Armstrong & Overton, 1977). Based on the sales revenue, employee size, and IJV longevity, there was no statistically significant difference in the mean of measured items between the early response and the late response; also, the statistics did not indicate any significant difference among the three universities. The sample represents a diverse array of industries, including electronics, manufacturing, information technology, medical supplies, services, construction, food manufacturing, electricity, and banking. For duplicate data, the lower confidence score on the answers was removed as we measured how confident the informant was on participants' responses at the end of the survey.

Measurement

Knowledge tacitness: This construct was defined as the extent of difficulty to articulate and codify a given domain of knowledge. This scale was measured with five items using a 7-point Likert scale anchored with *Strongly Disagree* = 1 and *Strongly Agree* = 7. Cronbach's alpha was 0.92.

Knowledge specificity: This construct was defined as specific functional expertise, such as product, marketing, and technological know-how. The scale was measured with

three items using a 7-point Likert scale anchored with *Strongly Disagree* = 1 and *Strongly Agree* = 7. Cronbach's alpha was 0.84.

Knowledge availability: This construct described whether the knowledge is available to the other party or not. The scale was measured with five items using a 7-point Likert scale anchored with *Strongly Disagree* = 1 and *Strongly Agree* = 7. Cronbach's alpha was 0.90.

Resource asymmetry: Resource asymmetry characterized the amount of resource invested by individual parties and involved the comparison between the two parties in terms of balance/discrepancy. The authors developed the scale based on Gundlach et al.'s (1995) work and had participants report their perceptual estimate of the asymmetry of resource commitment of the two parties in the IJV. The three items scale used a 7-point Likert scale anchored with *Strongly Disagree* = 1 and *Strongly Agree* = 7. Cronbach's alpha was 0.86.

Resource Complementarity: We adapted Sarkar et al.'s (2001) scale and modified it for the IJV context. The items characterized the level of resource interdependence in the relationship and measured the extent to which both partners perceived the value of resources and capabilities that the other brought to the relationship. The scale was measured with four items using a 7-point Likert scale anchored with *Strongly Disagree* = 1 and *Strongly Agree* = 7. Cronbach's alpha was 0.96.

Results

Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) was used to evaluate the measurement model. We follow the evaluation procedure of model fitness suggested by Bagozzi and Yi (1988). First, we use elliptical reweighted least squares to estimate the model, as the kurtosis value is a little bit high. The model converged, and no anomalies appeared in the results, such as improper solution or condition codes. The *Chi-Square* was significant ($X^2(215) = 462.21, p < .01$). According to Fornell and Larcker (1981), it can be caused by unknown power levels, inadequate goodness-of-fit measure, or sensitivity to the sample size. Therefore, we further checked other model fit indices and confirmed that the model fit the data well (CFI = .93, IFI = .93, RMR = .08). Second, we examined the convergent validity for all the factors. All the items have positive and significant standardized factor loadings and variances. Each scale's AVE is also above .50. Cronbach's α also showed excellent reliability (see Table 1). Third, we used one- and two-factor models to check discriminant validity. The results suggest that all the factors are unique and their measurements are exclusive to or have no overlap with each other.

To address common method variance, we used Harman's one-factor test. The exploratory factor analysis included the items for all six constructs. The unrotated factor analysis extracted six principal components. The items did not load on any single, common method factor (Podsakoff & Organ, 1986). The most prominent factor takes less than one-third of the variance. Moreover, a partial correlation test partial out the first principal components. The results show that almost all the significant partial correlations remained between the factors.

 Insert Table 1 Here

Econometric model

Generalized Linear Model (GLM) approach was used to test the model. The following equation illustrates our hypotheses.

$$\begin{aligned} \text{LEARNRACE} = & \beta_0 + \beta_1 \text{TACIT} + \beta_2 \text{SPCF} + \beta_3 \text{AVAIL} \\ & + \beta_4 \text{ASMTRY} + \beta_5 \text{CMPL} + \beta_6 \text{TACIT*ASMTRY} \\ & + \beta_7 \text{SPCF*ASMTRY} + \beta_8 \text{AVAIL*ASMTRY} + \beta_9 \\ & \text{TACIT*CMPL} + \beta_{10} \text{SPCF*CMPL} + \beta_{11} \text{AVAIL*CMPL} + \varepsilon \end{aligned}$$

Where

LEARNRACE = learning race between IJV partners

TACIT = knowledge tacitness

SPCF = knowledge specificity

AVAIL = knowledge availability

ASMTRY = resource asymmetry

CMPL = resource complementarity

Please see table 2 for results, which have strongly supported our hypotheses.

 Insert Table 2 Here

The rival model 1 with just main effects explained 23% of the variance. Our moderation improved the R-square to 37% and further improved to 45% with control variables.

Tacitness of knowledge suggests a negative main effect on learning race ($\gamma = -1.36$, $t = -2.62$, $p < .05$). The moderation of resource asymmetry on the relationship between tacitness and learning was not significant, not supporting H1, while resource complementarity indicates a significant moderation, neutralizing the negative effect of

high tacitness ($\gamma = .24$, $t = 3.15$, $p < .01$), resulting in H2 to be supported. Therefore, complementary resources can foster the IJV partners' motivation to acquire knowledge, even if the knowledge tacitness prevents such knowledge transfer (see Figure 1). The value of complementary resources might motivate the learning race, regardless of the difficulty of acquiring tacit knowledge.

The main effects model suggests that complex knowledge encourages the learning race between IJV partners, while specific knowledge provides fewer incentives on competitive learning behavior. Nevertheless, where resource asymmetry is high, specific knowledge moderately stimulates to learning race ($\gamma = .12$, $t = 1.73$, $p < .10$). For this reason, highly specific knowledge, which is relatively easier to acquire, induces more competitive learning when resource asymmetry is high than when it is low (see Figure 1). Due to the power imbalance caused by asymmetric resources, acquiring specific knowledge, which is fast and easy to acquire, can be a quick approach to reduce the dependency on the other party. At the same time, resource complementarity increases the value of specific knowledge, resulting in more learning race, even if the knowledge is high specificity ($\gamma = .17$, $t = 2.29$, $p < .05$). For this reason, H3 and H4 are supported.

The main effects model also suggests that inaccessible knowledge is hard to acquire, so we observe more learning race behavior when knowledge availability is high. However, the effect of availability is depressed by high resource asymmetry ($\gamma = -.21$, $t = -3.44$, $p < .01$). The moderation of resource complementarity shows no impact on knowledge availability toward learning race. Thus, H5 was supported, but H6 was rejected.

$$\begin{aligned}
\text{LEARNRACE} = & \beta_0 - 0.94 \text{ TACIT} - 1.20 \text{ SPCF} + 1.69 \text{ AVAIL} \\
& + 0.29 \text{ ASMTRY} - 0.42 \text{ CMPL} - 0.03 \text{ TACIT} * \text{ASMTRY} \\
& + 0.15 \text{ SPCF} * \text{ASMTRY} - 0.21 \text{ AVAIL} * \text{ASMTRY} \\
& + 0.15 \text{ TACIT} * \text{CMPL} + 0.15 \text{ SPCF} * \text{CMPL} \\
& - 0.16 \text{ VAIL} * \text{CMPL} + \varepsilon
\end{aligned}$$

Insert Figure 2 Here

Discussion

Our findings support that firms partake in IJV to learn from each other (Inkpen & Beamish, 1997). Four out of six hypotheses tested are supported, indicating that the IJVs analyzed are committed to the learning race. Partners' knowledge bases seemingly satisfy each other's strategic learning needs supporting Hillman et al.'s (2000) 'matching rule' (see also Eisenhardt & Schoonhoven, 1996). Partners are committed to the learning race whether knowledge is specific (H3 and H4) or available (H5). Only when knowledge tacitness is high, the learning race behavior is significantly reduced.

When the knowledge structure is asymmetric, the relationship between knowledge tacitness and learning race is statistically insignificant (not yielding support to H1). The causal ambiguity of tacit knowledge when resources are asymmetric challenges local partners to understand such knowledge (Chuang, Jackson & Jiang, 2016; Rechberg & Syed, 2014; Szulanski, 1996). In such a situation, comprehending all underlying cause-effect relationships and finding ways to apply knowledge to the local setting appears to be a real challenge, depressing the learning race. These findings are in line with Barney (1991), Brookes (2014), Uygur (2013), and Røvik (2016). Moreover, acquiring tacit

knowledge is challenging and time-consuming as tacit knowledge is embedded in individuals (Polanyi, 1962). For example, Polanyi's (1962) practical, situational, and emotional types of tacit knowledge may be too implicit to shared. The existence of valuable tacit knowledge may be beyond its holder awareness (Rechberg & Syed, 2014). Tacit knowledge is often embrained, embodied, and embedded in individuals, making it difficult to transfer (Collins, 1993).

To absorb tacit foreign knowledge, a local firm needs preexisting knowledge (Cohen & Levinthal, 1990). Resource complementarity can foster IJV partners' drive to acquire tacit knowledge. Park (2011b), for example, found that local partner receives foreign technical knowledge only if it possesses the necessary skill set to absorb it. Our findings confirm that in cases where partner's resources are complementary, partners commit to learning race (H2; see figure 1). Anh et al. (2006) confirm these findings by explaining that local partners may be familiar with foreign complementary knowledge, motivating the partner to invest in training and development activities to facilitate the acquisition of tacit knowledge.

Successfully racing for tacit knowledge is of significant importance as tacit knowledge is the most valuable source of competitiveness and the source of knowledge creation (Kaufmann & Runco, 2009; von Krogh et al., 2000). Indeed, RDT suggests that IJV can help firms gain access to valuable and complementary resources that are difficult to replicate yet critical to address environmental uncertainties (Das & Teng, 2000; Hillman et al., 2009; Pfeffer & Salancik, 1978). However, where knowledge is a source of power, partners may deliberately refrain from sharing what they know to protect their bargaining power (Rechberg & Syed, 2013; Rechberg, 2018). Inkpen (2000) speaks of

knowledge protectiveness as one reason for the hindrance of learning race. The prospect of a reciprocal joint learning experience that can enable both IJV partners to develop tacit knowledge is damaged by opportunism (Cheng, Cai & Jin, 2016; Lumineau & Quélin, 2012).

Where knowledge is specific and available, partners partake in the learning race, whether resources are complementary (H4) or asymmetric (H3 and H5) in nature. Specific knowledge may be copied without extensive effort as such knowledge may be explicit, codified, and sequential. Complementary resources combined with specific knowledge ease knowledge acquisition because it only requires some previous understanding (Hansen, 1999), facilitating the race to learn (Barney, 1991; Cohen & Levinthal, 1990; Shenkar & Li, 1999). When knowledge is specific (H3 and H4), local IJV partners commit to the learning race, more so when IJV partner's resources complementary is high (H4), and less so when resources asymmetry is high (H3). Specific knowledge such as functional expertise, production, marketing, and technological know-how, combined with the existing knowledge pool, can reduce resource dependency. Where resource asymmetry exists, the race for specific knowledge may enhance bargaining power (Amit & Schoemaker, 1993; Hamel, 1991). For example, Danis and Parkhe (2002), found that in a Hungarian–Western alliance, the Hungarian partners learned specific methods of management from their partner, allowing them to gain independence and competitiveness in the local market.

When the resources contributions are balanced, IJV partners become less aggressive on learning race, particularly for highly available knowledge. Partners can acquire available knowledge such as templates, written vision, mission, goals, and

objectives without much effort (Hoetker & Agarwal, 2007). Even though available knowledge may exist beyond the IJV, limiting its sources for competitiveness, available knowledge can be a valuable source of independence (Steensma & Lyles, 2000) and thus worth racing for learning.

We did not find support for Hypothesis 6, which states that in the presence of high knowledge availability and high resource complementarity, the local IJV partners commit more to the learning race. On the contrary, in such a situation, the learning race declined. By making knowledge available, partners had an easy access to each other's knowledge, assisting collaborative learning. When knowledge is widely accessible, maybe collaborative -, rather than competitive - learning dominates the relationship. Complementarity resources in IJV provide benefit to both the parties. In this situation, each partner will have a vested interest in sustaining the ongoing relationship through collaboration so that each can continue benefiting from the other's complementary resources. As a result, the learning race, which may be viewed as a hindrance to collaboration lessens (Larsson et al., 1998).

Implications for research

The findings of this study have implications for both theory and practice. First, RDT presents that inter-partner relations result in dependency on other firms' resources (Pfeffer & Salancik, 1978). When the resources of partners match the local firm's specific resource needs, the dependence solidifies (Hillman et al., 2000; Pfeffer, 1972). In IJV, alliance partners depend on each other for resources and expertise. They seek regulatory support, market access, legitimacy, physical assets information, and human capital (Hillman et al., 2009). The dependency will also result in bargaining power for the

partner with more resources (Inkpen & Beamish, 1997; Lecraw, 1984; Yan & Gray, 1994). Resources in our study is knowledge, and the bargaining power could be increased by increasing the knowledge gap and resource asymmetry. Bargaining power literature presents that the more powerful firm in IJV enjoys management control (Lecraw, 1984; Yan & Gray, 1994). It is reasonable to argue that a lesser powerful firm tries to reduce the knowledge gap, and thus, dependency, as much as possible (Hamel 1991; Inkpen & Beamish, 1997). We empirically identify ex-ante conditions – that is, some combinations of knowledge characteristics and resources structure - under which the bargaining power could shift. Our primary contribution to the bargaining power literature is that the shift in bargaining power is difficult, especially when the knowledge is tacit in nature. Tacit knowledge is causally ambiguous, embodied and encultured (Blackler, 1995). When collaboration, rather than competitive learning, dominates the relationship, the shifting of the bargaining power is of less relevance because partners are making their knowledge widely available to one another at the outset.

Implication for practice

There is growing evidence from our research and others that the partners in IJV involve in competitive learning for independence. The short-term benefit of competitive learning comes at the expense of long-term benefits of collaboration. Competitive learning is a threat to IJV survival. IJV longevity and durability allows partners to accumulate knowledge and capabilities from each other, overcoming possible competitive disadvantage and achieving global competitiveness (Delios & Beamish, 2001; Steensma & Lyles, 2000). For emerging economies such as China, IJV survival ensures the development of the private sector and establishes a strong presence in the region (Steensma & Lyles, 2000). Our study indicated that the condition that could deter

competitive learning in IJV is for both partners to make their knowledge widely available to one another and decrease the inequality in IJV equity as much as possible.

Knowledge availability in the IJV relationship could also help develop trust among IJV partners (Ke & Wei, 2007). Trust reflects good intent, reliability, and competence of partners' sharing their knowledge. When inter-organizational trust is present, the partners do not foresee each other as competing for learning and taking advantage of others to gain a bargaining power (Ke & Wei, 2007).

On a positive note, our study indicated that the presence of tacit knowledge, which is the most valuable source of competitiveness, reduces learning race. Partners could acquire tacit knowledge, which is embodied (know-how), encultured (shared understanding), and embedded (organizational routine; Blackler, 1995), through long-term collaboration and not through competitive learning. Therefore, we recommend that partners use caution when learning know-how. Moreover, we recommend IJV partners to understand that tacit knowledge is not something that could be achieved hastily through learning race, as doing so could only jeopardize IJV survival.

We also advise partners in IJV to take stock of their prerequisite knowledge or absorptive capability, which is required to learn advanced skills (Fang & Zou, 2010). To that end, understanding differences in partner's culture could be a good starting point. Chinese managers stress on a long-term human resource management (HRM) such as long term contract strategy whereas Western managers stress on a short term HRM strategies such as hire-and-fire (Buck, Liu, & Ott, 2010). Differing national and organizational culture leads to misunderstanding and friction between partners (Hau & Evangelista, 2007), hampering the ability to absorb knowledge (Simonin, 1999)

successfully. Culture-based factors that can restrain knowledge sharing include values, norms, and individuals' fairness perception (Kohlberg, 1981; Rechberg, 2018).

And lastly, to establish essential element of knowledge exchange, reciprocity in knowledge sharing among partners is necessary (Rechberg, 2018). Learning from each other results in reduced dependency, yet successful sharing knowledge among partners may create a climate of trust in an alliance (Magnini, 2008).

Limitations and future studies

There are several limitations to this study. First, we rely on a single source data to examine the learning race behavior in IJV. Both foreign and local firms could undertake the learning race, solely relying on one respondent may therefore not provide a complete picture of learning race behavior in IJV. Future research may collect data from both the local and foreign firms to measure the learning race in IJV. Second, we use resource structure as the environmental condition for the investigation of knowledge characteristics and learning race. Other conditions could either deter or facilitate learning race. We suggest for more research on the impact of absorptive capacity of firms, fairness perception, the longevity of IJV, and organizational or national cultural differences to investigate the intensity of learning race in IJV. Moreover, what effect does reciprocity and trust have on learning race behavior in IJV? Third, we did not empirically address the consequences of learning race behavior. Inkpen and Beamish (1997) present that the shift in the bargaining power as a result of the learning race could lead to instability in IJV and early termination of the alliance. In the future, researchers could examine the consequences of learning race on IJV survival and longevity. In the hypotheses development section, we briefly mentioned the importance of control mechanisms such

as contracts, rules, and regulations that enable firms to protect their knowledge from imitation by partner, however, we do not test the impact of control mechanisms on learning race. It will be an exciting pursuit for future research to examine the extent of the effect that control mechanisms have on preventing learning race. It is also essential to understand how partners in IJV develop mechanisms to protect their tacit knowledge, something that is difficult to bring under the purview of control mechanisms, such as contractual agreement.

Conclusions

This study informs IJV theory and practice that knowledge characteristics and resource structures impact IJVs' learning race behavior. We use RDT to develop arguments for our hypotheses. Our analysis of 124 IJVs shows that some interactions between knowledge characteristics and resource structure are either more valuable or easier to acquire than others. Namely, partners in IJV tend to commit more to learning race for tacit and highly specific knowledge when organizations in IJV share complementary resources. Moreover, partners commit more to learning race for highly specific knowledge when resource asymmetry is high, and highly available knowledge when resource asymmetry is low. In the discussion section, we provide the theoretical and practical implications of our study. By conducting this study, we have identified conditions that could lead to learning race in IJV. We recommend that partners in IJV involve in long-term collaborative learning and avoid learning race, which may threaten the survival of IJV. We also presented four limitations of this study and simultaneously suggest research the future course of actions to address learning race behavior in IJVs.

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Figure 1. Race to learn: knowledge characteristics and resource structure

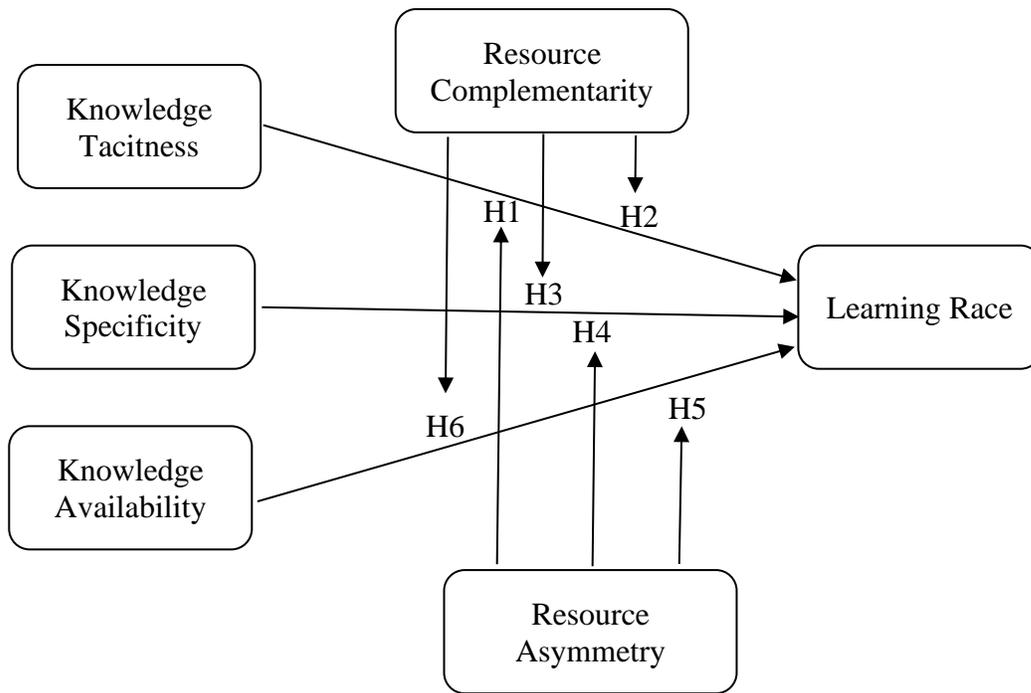


Table 1. Confirmatory factor analysis and reliability test

Constructs/Items	Standard Loading	R ²	t-value
Learning Race (AVE = .73, Cronbach's α = .88)			
We have tried to learn the <i>knowledge/skills</i> from our partner as fast as we can.	.83	.69	
Wherever possible, we have tried to be faster than our partner in acquiring knowledge/skills.	.95	.90	10.94
We have been racing with our partner in learning from each other.	.77	.59	8.79
Resource asymmetry (AVE = .72, Cronbach's α = .86)			
There has been an imbalance in the resource commitments between our partner and us.	.78	.61	
The discrepancy of the amount of resources committed by our partner and us to the JV has been large.	.96	.92	9.25
Our partner and we have contributed approximately the same amount of resources to the JV.	.79	.62	8.43
Resource complementarity (AVE = .87, Cronbach's α = .96)			
Both partner firms have needed each other's resources to supplement their own resources.	.94	.88	
Both partner firms have needed each other's resources to accomplish their goals and responsibilities.	.93	.86	18.30
Resources brought into the venture by each partner firms have been valuable for each other.	.95	.90	19.25
Resources brought into the venture by each partner firms have played an important role in the JV.	.91	.82	16.88
Knowledge Characteristics:			
Tacitness (AVE = .68, Cronbach's α = .92)			
<i>The knowledge/skills</i> that we have tried to learn from our partner->			
are provided in specific manuals.	.84	.71	
are clearly described with operating procedures.	.86	.74	10.82
are embodied in software or documentation.	.88	.77	11.07
are easily codifiable (in instructions, formulas, etc.)	.83	.69	10.14
are more explicit than implicit.	.70	.49	7.95
Specificity (AVE = .65, Cronbach's α = .84)			
are about specific functional areas.	.81	.65	
can be specified by step-by-step.	.88	.77	9.44
can be separated from other things.	.72	.52	7.58
Availability (AVE = .60, Cronbach's α = .89)			
The knowledge/skills that we tried to learn from our partner are accessible to our personnel.	.66	.44	

Employees from our firm had free access to our partner's knowledge/skills.	.72	.52	6.33
We could get hold of our partner's knowledge/skills whenever we want to.	.91	.82	7.52
Our partner was willing to share with us the knowledge/skills.	.77	.59	6.72
There were no barriers for us to learn about the knowledge/skills from our partner.	.80	.64	6.92
X^2 (d.f. = 215, $p < .01$)		462.21	
BBNFI		.91	
CFI		.93	
IFI		.93	
RMR		.08	

Table 2. Regression model for learning race

Variables	Model 1 Main effects (SE)		Model 2 Moderation model (SE)		Model 3 Moderation model with control variables (SE)	
Intercept	2.92***	(.83)	5.93	(4.51)	7.47*	(4.35)
Knowledge tacitness	-.11	(.08)	-.94*	(.53)	-1.36**	(.52)
Knowledge specificity	.17*	(.09)	-1.21**	(.59)	-1.23**	(.56)
Knowledge availability	.06	(.08)	1.69***	(.54)	1.56	(.51)
Resource asymmetry	-.02	(.07)	.29	(.55)	0.34	(.52)
Resource complementarity	.19**	(.09)	-.42	(.64)	-1.03	(.63)
Moderations						
Knowledge tacitness ×			-.03	(.06)	-.03	(.06)
Resource asymmetry Knowledge specificity ×			.15**	(.07)	.12*	(.07)
Resource asymmetry Knowledge availability ×			-.21***	(.06)	-.21***	(.06)
Resource asymmetry Knowledge tacitness ×			.15**	(.08)	.24***	(.08)
Resource complementarity Knowledge specificity ×			.15*	(.08)	.18**	(.08)
Resource complementarity Knowledge availability ×			.16**	(.07)	-.13*	(.07)
Control variables						
Cultural compatibility					-.04	(.09)
Interfirm rivalry					.26***	(.07)
Trust					.02	(.11)
R-Square	.23		0.37		.45	
F Value	7.04 (5, 118)		5.98 (11, 112)		6.28 (14, 109)	
Root MSE	.99		.92		.88	

* $p < .10$. ; ** $p < .05$. ; *** $p < .01$.

Figure 2. Moderating effects of resource complementarity and asymmetry

