

How long will the marriage of Sino-Foreign JVs in China last?

A theoretical and empirical investigation

Abstract

This paper studies the factors affecting the longevity of international joint ventures (IJVs) in China and investigates the strategic interactions of the players in an IJV (foreign parent, local parent and IJV management) by adopting game theory and using empirical analysis based on national perceptions of time horizons. The theoretical part shows equilibria for the games played by the parents. The empirical evidence, based on a sample of Chinese-US and EU IJVs, as well as Chinese-Japanese and South Korean IJVs, is consistent with the propositions derived from our theoretical models. Our empirical findings show that the longevity of an IJV is affected by senior management control. Access to local knowledge is also a crucial factor affecting longevity. Furthermore, the degree of long-term orientation (LTO) of the parents influences the longevity of Sino-Foreign IJVs. The contributions made by both foreign and local parent firms are also found to influence the longevity.

Keywords: International Joint Ventures, Longevity, Senior Chinese Management, Knowledge Access,

1. Introduction

Over the last thirty years, since China initiated economic reforms and an open-door policy, the country has been transformed from a poor nation almost entirely isolated from the global economy to the second largest economy in the world (Zhang and Liu, 2009). China's dynamic transition and integration into the global economy has also brought fundamental changes in the way it conducts business (Tung et al., 2008). One feature of this change has been reflected in how to manage international joint ventures (IJVs) (Luo, Shenkar and Nyaw, 2001). However, despite two decades of an intense East-West relationship through different forms of international collaboration, and despite intensive research on Chinese international joint ventures (Buck, Liu and Ott, 2010; Demir and Söderman, 2007; Fey and Beamish, 2001; Li et al., 2002; Luo, 1998; Puck et al., 2009; Roy, 2012; Shenkar, 2001; Yao et al., 2013), there is still a lack of consensus on the factors contributing to the longevity of Sino-Foreign JVs. In particular, underexplored areas are the inter-relationship between senior management control from different nationalities and resources contributed by parent firms.

Prior research on the longevity of Sino-Foreign JVs has mainly focused on equity ownership, knowledge acquisition, cultural distance and contributions by parent firms (Barkema and Vermeulen, 1997; Fey and Beamish, 2001; Hennart and Zeng, 2002; Kaufmann and O'Neill, 2007; Lin and Germain, 1998; Park and Ungson, 1997, Li et al., 2002; Roy, 2012; Shenkar, 2001; Yao et al. 2013). However, most existing studies have examined these factors independently, and this offers an incomplete account of the reasons behind the longevity of Sino-Foreign JVs. In addition, empirically-driven studies dominate the existing literature, and few papers have offered theoretical models to formalize the inter-play between foreign and local partners (Ott, 2006). The strength of a game-theoretic approach is that it does not

analyze the impact of independent factors on IJV longevity in isolation, but it reveals the combined effects of multi-player decision-making by taking into account the interconnectedness of multiple players' strategies and objectives. Compared to previous work which looked into contracting, signaling and repeated games (Zhang and Rajagopalan, 2002; Ott 2006, 2013), we are using simultaneous and sequential move games and apply them to the longevity of IJVs. The game-theoretic approach to IJV longevity has thus been underexplored, and this represents an important research gap.

Extending previous research on Sino-Foreign JVs, this paper aims to examine the multiple factors affecting the longevity of Sino-Foreign JVs by applying the game-theoretic approach. In particular, we focus on the impact of senior management control in Sino-Foreign IJVs and the contributions made by both local and foreign parent firms on the longevity of Sino-foreign JVs as well as the strategic interaction between management control and the contributions from local and foreign parents. In the context of Western and Asian partners, and so-called East-West and East-East IJVs, we also conduct theoretical modeling and empirical tests on whether one distinctive dimension of national culture, i.e. long-term orientation (LTO), interacts with senior management control and affects the longevity of Sino-Foreign JVs.

This paper proposes two contributions to the literature. First, we go beyond the empirically dominated literature by constructing a theoretical model which formally represents the relationship between the characteristics of IJV partners and the longevity of IJVs. Hence, we offer a unique contribution by formalizing the factors contributing to the longevity of IJVs. A game theoretic approach enables us to theorize about the factors identified in the empirical literature and helps to provide new insights into the longevity of Sino-Foreign JVs. Our

research thus complements prior studies based on empirical tests (Fey and Beamish, 2001; Hennart and Zeng, 2002; Li et al., 2002; Luo, 1998; Roy, 2012; Shenkar, 2001).

Second, unlike previous research (Buck, Liu and Ott, 2010; Kaufmann and O'Neill, 2007; Park and Ungson, 1997), which either considers management control and contributions from parent firms in isolation or only examines the impact of cultural distance on IJVs' longevity, we simultaneously analyze the interdependence of these factors, including senior management control, different degrees of LTO and contributions from parents. Such an approach enables us to consider not only the direct impact of senior management control and resource contributions on the longevity of Sino-Foreign JVs, but also the inter-play between senior management control with different degrees of LTO and contributions from parent firms. Makino et al (2007) found that IJVs with strategic asset-seeking purposes last longer than those which are formed for resource, capital and market-seeking purposes. Our findings complement their findings by showing that high-tech IJVs with knowledge access purposes tend to last longer. Findings from this study help to enrich understanding of the factors determining the longevity of IJVs in China and generate significant theoretical and managerial implications.

2. Literature review

This research focuses on exploring the conditions which lead to the longevity of Sino-Foreign JVs in China. A Sino-Foreign JV is jointly owned by a local Chinese company (as local parent) and at least one MNE from the USA, Europe, Japan or any other Asian country (as foreign parent) (Luo, 1998). The formation of the IJV and the management affect the duration and stability of a joint venture, as well as the partner relationship, the interaction between the

partners and the ownership shares. Based on the definition of IJV (Ott, 2006), the parent relationship is seen in light of an IJV (as the child of both companies) and the partner relationship is referring to the relationship between the parent companies. This is similar to a family in which the parents are seen in relation to the child, whereas they are partners when it comes to their own relationship. Extensive research into factors affecting the survival of IJVs found that, in China, the uncertainty of environmental factors, cultural issues, knowledge acquisition and access, and contributions by parent firms are the main factors (Child and Yan, 2003; Cuypers and Martin, 2010; Inkpen and Beamish, 1997; Li, Karakowsky and Lam, 2002; Lin and Germain, 1998; Makino et al., 2007; Roy, 2012; Zhang and Rajagopalan, 2002). In this section, we systematically review the existing literature based on the factors affecting IJV survival and provide the theoretical foundation to our study.

2.1. Cultural distance of partners

Cultural distance has always been a notable feature in IJVs and affects conflict resolution within IJVs as well as survival (Barkema and Vermeulen, 1997; Buck, Liu and Ott, 2010; Fey and Beamish, 2001; Hennart and Zeng, 2002; Lin and Germain, 1998; Park and Ungson, 1997; Li et al, 1998; Li et al., 2002, Luo, 1998; Roy, 2012; Shenkar, 2001). The relevance of cultural distance with regard to the choice of partners (Luo, 1998) and entry modes (Kaufmann and O'Neill, 2007) was a key research element for the setting-up stage of IJVs in China.

Lin and Germain (1998) proposed that cultural closeness benefited conflict resolution, and this benefit increased with IJV longevity. They argued that IJV longevity results in familiarity which not only produces an open, problem-solving approach to conflict resolution, but also a

greater willingness to support a partner's desired course of action. Another reported benefit of longevity is that partners would be less likely to rely on written agreements in conflict resolution than they would in short-term relationships. However, Hennart and Zeng (2002) proposed that the mixed findings concerning *the impact of cultural distance and closeness on IJV survival* are due to the fact that some of these studies did not control for external factors (rate of growth of country, industry changes and exchange rate volatility). More importantly, Makino et al (2007) found that cultural distance between the IJV partners is a source of misunderstandings and that smaller IJVs tend to face greater liability. The longevity of IJVs is, thus, a matter between the relationships of the players due to organizational and cultural complexity.

Park and Ungson (1997) and Hennart and Zeng (2002) showed that the cultural mix of IJV partners affects the longevity of an IJV. Park and Ungson (1997) found that US-Japanese JVs survived longer than US-US JVs, whereas the latter showed that Japanese-Japanese JVs survived longer than US-Japanese JVs. These findings are consistent with the possibility that *the level of LTO of the partners* has an influence on longevity. Buck, et al. (2010) adopted the concept of LTO and examined whether foreign partners in Sino-Foreign JVs with different levels of LTO affected enterprise strategies. They established a link between partners' different levels of LTO and strategic human resource management decisions taken by Sino-Foreign JVs. In terms of working relationships in Sino-American JVs, Walsh et al. (1999) highlighted the fact that the views of American and Chinese managers in the same JV differed and this impaired their collaboration and activities which was evidence of cultural differences and their impact on the management of IJVs.

Lu and Xu (2006) investigated the growth and survival of Sino-Japanese JVs in China by focusing on the local parent and ‘decompartmentalized’ local advantage. Their findings helped to explain the legitimacy aspect of growth and survival connected to the local parent’s age and size. Li et al. (2002) compared the effect of cultural diversity and cultural distance between the Sino-Japanese and Sino-Western JVs in China and argued the benefits of joint management for longevity in comparison with overseas partners’ dominance in IJV management. They postulated that the effect of cultural distance disappears the more advanced the firms are in international expansion. Their results showed that cultural distance affects *transaction efficiency, the selection of location and the sharing of firm resources*.

However, Hanvanich et al (2005) found a different rationale and proposed that the preference of an IJV as ownership strategy occurs when national culture differences are high, since in the long-term an MNE ought to acquire the local partner’s share of the equity JV. They argued that the increase in national culture differences mean increased unfamiliarity of local knowledge for MNEs. This would lead to the need of a local partner to understand the environment. Hanvanich et al (2005) stressed the impact of cultural differences on learning and knowledge acquisition. In addition, Makino et al (2007) point to the fact that cultural distance as a source of misunderstanding and miscommunication affects the longevity of an IJV.

This section highlighted that cultural differences between IJV partners can have an impact on resource sharing, the flow of knowledge, the learning process, and most importantly the longevity of the IJV. What is absent in the existing literature is that there is a lack of research which goes beyond empirical testing. To address this research gap, we use cultural

differences as antecedent constructs for longevity and take LTO as a dynamic component for designing cultural differences between the players in a game theoretic model.

2.2. Contributions of the parents

Contributions made by parent firms are also a critical factor affecting the longevity of IJVs. Zhang and Rajagopalan (2002) found in the repeated games of Sino-Japanese JVs that most local partners in developing countries contribute local knowledge, e.g. by facilitating local government relations, registering ventures, renting land and recruiting workers. They argue that business expertise such as technology and access to local marketing channels become more significant contributions after the formative period and, therefore, more credible threats. The authors reasoned that if local partners do not have this expertise, they are likely to be 'held up' by the foreign partner who can contribute most rent to the IJV. If the main contribution of the foreign partner is technology transfer, and over time the IJV does not depend on the foreign partner's continuous supply of technology, the foreign partner could be held up, and the local partner could appropriate the most rent from the IJV. Zhang and Rajagopalan (2002) stressed that partner learning creates a credible threat since IJVs facilitate knowledge acquisition by the parents. Yeheskel et al (2004) considered learning as part of a post-corporation interaction between the IJV partners in which they benefit from efficiently interacting in the pre-corporation stage. This interaction should protect against opportunistic behavior.

Lu and Beamish (2006) found in their investigation of Sino-Japanese JVs that a consideration of the characteristics of resources contributed by IJV partners may contribute to an understanding of longevity. In order to avoid the obsolescence of IJVs, they suggested that

parent firms should contribute a diverse and continuing set of resources. Similarly, Makino et al. (2007) considered Sino-Japanese JVs and suggested that IJVs formed for strategic asset-seeking purposes tended to have a greater likelihood of planned termination, but a lesser longevity than those formed for resource/labor, capital and market-seeking purposes. This all suggests that termination decisions are endogenous to the initial purpose of formation. Makino et al. (2007) concluded that the international experience of Japanese parents had a negative influence on longevity, whereas other studies found that the international experience of local Chinese parents had a positive influence on longevity (Zhang and Rajagopalan, 2004).

Newburry et al (2003) found that there is less disagreement between parents and their IJVs when the IJVs are older, larger and when there is a greater degree of similarity between parent company goals. This is in favor of our assumption regarding the longevity of IJVs. On the other hand, Fetscherin et al (2010) concluded that increased levels of JV autonomy have implications for the trust relationship between the foreign headquarters, the JV and the domestic partner. They even found that the overall transaction costs of doing business in China remain at a significant scale for 30 years even after attracting foreign investors.

Reviewing the prior literature in this area, we have identified a missing link between the contribution of the IJV parents and its implications for longevity, particularly the contribution of knowledge as a source of conflict. This will be the focus of our theoretical enquiry based on game theory and empirical tests.

2.3. Knowledge access and acquisition from the parents

In a recent publication Li et al (2013) classified and distinguished knowledge acquisition and knowledge accession for strategic alliances. We can apply their definitions to the case of IJVs. For example, partners A and B can provide knowledge to an IJV, but do not expect the IJV to give something back to the parents. This is the process of putting knowledge into the IJV. This means that the nature of *knowledge accession* is not reliant on learning but that partner A and partner B are interested in the amalgamation of existing knowledge rather than absorbing new knowledge. The combined specialized knowledge could lead to a new product. On the other hand, *knowledge acquisition* emphasizes the partners' aim of acquiring knowledge in order to learn, which means that new knowledge flows back to the parents. Li et al. (2013) stressed that partners would be protective of their knowledge, particularly when they compete.

Hanvanich et al's (2005, p. 409) results similarly stressed that 'in culturally different situations firms in high technology industries face difficulties in both acquiring and protecting their knowledge'. Tsang (1999) at an earlier stage of analyzing MNEs and their subsidiaries considered expatriates in local environments as agents of knowledge transfer and learning. Similarly, Inkpen and Beamish (1997) viewed the foreign parent as part of this process.

Inkpen and Beamish (1997) suggested that IJVs are formed to exploit inter-firm differences in skills, reporting a high correlation between the *acquisition of local knowledge* and longevity. They argued that (1997, p.199) 'Once the foreign partner has acquired local knowledge, unless the local partner is contributing other valuable and inimitable skills to the JV, the rationale for cooperation will be eliminated. Instability may be the result, although attachment between the partners may moderate shifts in bargaining power. Thus, the

acquisition of local knowledge is an enabling device for the foreign partner to operate anonymously'. The authors, therefore, suggested that local partners may take steps to ensure that they contribute more than local knowledge, thus reducing instability. This is consistent with their advice in an earlier paper that if the foreign parent chooses access to local knowledge without acquisition as a possible strategy, then the IJV could be stable, enhancing the competitive advantage (Beamish and Inkpen, 1995). Wang et al. (2004) investigated a parent company's capacity and willingness to transfer knowledge in the context of knowledge contributed and acquired by the parent and the Chinese subsidiary. Similarly, Demir and Söderman (2007) found that foreign CEOs run the risk of being out-learned, internally as well as externally. Their findings strengthen the view that the accumulation of experience and skills in transition economies evolves sequentially.

Drawing on insights from transaction cost economics and institutional theory, Puck, Holtbrügge and Mohr (2009) explore why and when an IJV is converted into a wholly owned subsidiary in China and have found that the acquisition of local knowledge by the foreign firm and isomorphic pressures from the foreign firm network are crucial factors affecting the likelihood of a conversion. Their findings indicate that when foreign firms possess local knowledge, the chance increases that these firms will change their ownership mode after their entry into a foreign market. Hence, complementary assets influence the existence and survival of IJVs.

Besides the role of knowledge acquisition discussed above, Fang and Zou (2010) suggest that a foreign firm's absorptive learning capacity might increase its dependency on the local partner through the enhancement of joint learning capacity. On the other hand, they found that the local partner's absorptive learning capacity reduces its dependence on the foreign

firm. Therefore, local and foreign partners show differences in their absorptive learning activities, and Fang and Zou (2010) argue that this dependence asymmetry drives IJV instability.

Recent findings on knowledge acquisition (Park, 2011; Yao et al., 2013) highlight knowledge acquisition in IJVs as an efficient means of learning or absorbing technology and tacit know-how that is organizationally embedded. Park (2011) shows that it is not only the absorptive capacity of the IJV but also of the knowledge transfer capacity of the MNEs that is crucial to knowledge acquisition. An IJV's success in learning from foreign parents is accordingly dependent on knowledge transfers. Knowledge transfer from foreign parent to IJV adds another angle to the discussion of knowledge acquisition in IJVs. Yao et al. (2013, p. 224) explored further IJV knowledge absorption effectiveness and defined this as the 'aptitude of the IJV to organize and share existing knowledge, gather and assimilate each partner's complementary knowledge, and collectively generate new knowledge that otherwise would not have existed, fully mediates the relationship between knowledge complementarity and new product development.' These authors emphasize that Sino-Foreign JVs are a growing and significant economic phenomenon which most foreign firms and local Chinese firms establish to gain access to each other's complementary knowledge bases (Luo, 2000). These observations are in line with our assumptions that local Chinese firms seek foreign partners' knowledge of R&D and technology, whereas foreign firms are interested in local partner's knowledge in managing local expertise. Where IJVs are motivated by knowledge transfer and knowledge acquisition, they are stable as long as the partners have not acquired the missing knowledge.

This literature review has shown the importance of culture, contribution, control and knowledge acquisition and access for the longevity of IJVs. Foreign partners tend to acquire the knowledge of the local partner. Once the foreign parent has acquired local knowledge, then the incentive to stay in the joint venture is reduced. The local parent can, however, also provide knowledge access channels through local senior management control. The longevity of an IJV is linked to the knowledge provision of the parents. We go beyond existing literature by connecting knowledge access and provision with the strategic relevance of the partner's time perception and thus long-term orientation is a necessary condition for longevity. The degree of LTO directly influences longevity. In other words, the local parent should provide access to local knowledge by opening channels through which local knowledge can be shared with foreign partners. Additionally, the provision of local knowledge or complementary assets should include a wide range of resources such as technology and production which may help contribute to the survival of an IJV.

Drawing upon the necessary conditions for longevity in IJVs identified in the existing literature, we are now able to develop the conceptual framework and present it in Figure 1. This conceptual approach considers the local and foreign parent having a different cultural background based on their time horizons or LTO. Variations in time perspectives have a crucial impact on the strategies of IJVs, with implications for resource contributions. Extending the existing literature above, we propose that *resource access* is a more decisive factor contributing to longevity than resource acquisition. The longevity concept, therefore, uses the *provision of local senior management in an IJV as a channel for local knowledge access*. Similarly, we consider *contributions* to technology, production and finance from foreign and local parents as key factors affecting survival.

Insert Figure 1 near here

The underlying conceptual framework, therefore, considers the acquisition of knowledge of the other party through learning in an IJV a potential source of early termination, whereas sharing local knowledge via local senior management reduces the premature termination of the IJV. The longevity of an IJV is dependent on the degree of LTO of the parents, their strategic interactions regarding the provision of resources as contributions to the IJV, and finally the interaction between the choice of senior management and management control related to the contributions. We adopt a game theoretic modeling approach and use the insights discussed above to capture the strategic interactions and show the moves in an IJV related to longevity.

2.4. Strategic interactions between the players – Game Theory

In an IJV we have three players (local, foreign and IJV) who make their moves and use their strategies to reach an outcome which not only benefits them individually, but also the whole venture (Ott, 2006; 2013). These complex decision-making scenarios have an impact on the longevity of any IJV. Game theory is a strategic tool to consider decision-making between many players, with their strategies and pay-offs. Within the international business (IB) field, Zhang and Rajagopalan (2004) embedded their research in an iterated Prisoner's Dilemma game. This game theoretic approach had the advantage of analyzing the strategic interaction between the players. The IB literature has also used game theory for static, simultaneous move situations regarding MNEs and market structures (Graham, 1998), dynamic games for MNEs, national states bargaining (Agmon, 2003; Luo, 2004) and MNE knowledge spillovers (Sanna-Randaccio and Veugelers, 2007). Casson (1994) used the strategic interaction

and equilibrium concept of a leader-follower relationship, and Ott (2006) applied the incomplete information concept to games between IJV players. Some studies use game theory as a tool to analyze the strategic interactions between at least two players, and the moves or strategies of each player connected to the other player's decision (Casson, 1994; Myerson, 1991; Ott, 2013). The pay-off for each player shows the equilibrium path and the outcome of the game as a combination of co-operation and self-interest. We, therefore, use simultaneous move and sequential move games to analyze the decision-making in IJVs with many players and coalitions. This can be referred to as a multi-person decision-making scenario in IJVs. We are now able to use the cultural distance, contributions and control over knowledge access and acquisition in combination with strategic interactions in IJVs to determine longevity.

Ott (2013) suggested using dynamic models of game theory to show the relevance for real-life International Business problems. We follow her approach and start with a Prisoner's Dilemma to show the simultaneous choices. Expanding game theoretical models towards dynamics, we use the LTO of the partners as a determining factor for the strategies and the pay-offs (length of duration). This offers the elegance of a logical tool and enables us to combine it with the real-life background. The notation and rules of the games are explained below.

In the following section we use the strategic form game to show strategic interactions between the partner firms of an IJV based in China with simultaneous moves, and the extensive form games for sequential moves. We use a long-term and short-term lens to analyze its contribution to the longevity of an IJV. The outcome of the static and the dynamic

games should help to generate insights into the strategies of a multi-person decision-making scenario and its impact on the longevity of Sino-Foreign JVs.

3. The Model

There are many ways of showing the longevity of IJVs. The literature has shown that partner selection, bargaining, contracting and reputation have an impact on the duration of international joint ventures. Combining the players with their strategies in static and dynamic games offers a way of looking forward and reasoning backward to come up with results to anticipate the longevity. Ott (2013) suggested applying game theory to international business topics which are dealing with strategic interactions between different players. Sino-Foreign Joint Ventures can be seen in this respect as combining managerial and economic strategies. Their longevity is a phenomenon. We go on to strategically analyze this phenomenon and base the pay-offs on the duration of an IJV.

In this section, we develop formal models to analyze the strategic decisions of IJVs in China which have long-term implications and an effect on longevity. Hofstede and Bond (1988) proposed LTO to accommodate a distinctive dimension of the Chinese culture and an Asia-wide phenomenon. This dimension relates to Confucian values that have an impact on family relationships, work relationships, governmental relationships and trust-building. Creating and maintaining long-term, trusting relationships in China influences decision-making and the survival of IJVs where foreign partners may have different degrees of LTO, e.g. short term orientation (STO) in US-EU companies.

The longevity of IJVs is susceptible to analysis in terms of time orientation. For example, previous studies have examined the impact of cultural values on IJV stability (Sim and Ali, 2000), and based on these one expects that LTO may influence the longevity of IJVs. For example, Japan and South Korea have a national culture of high LTO, with national measures of 80 and 75 respectively (Hofstede, 2007). However, the USA and the EU have relatively low LTO (29 for the USA; within the EU, ranging from 20 in the UK to 32 in Poland). We, therefore, identify cultural clusters comprising US and EU investors in IJVs from countries with relatively low LTO (Javidan and House, 2002), and partners from these countries may be expected to experience a shorter longevity of IJVs. On the other hand, IJV partners from an Asian cluster (South Korea and Japan) may be expected to contribute a long-term perspective to IJVs.

Let us consider the following games and their concepts based on Myerson's (1991) game notation as this fits the purpose of analyzing IJVs in China from various angles necessary to understand the longevity and the factors leading to stability. The first part will be a strategic form game (Nash Equilibrium), and the second part deals with the extensive form game of a leader-follower relationship (Stackelberg Equilibrium).

3.1. Strategic Form Games

We can denote the strategic form game as

$$\Gamma^{IJV} = (N, (C_i)_{i \in N}, (u_i)_{i \in N})$$

where N is the set of players. In our case $N = (\text{For}, \text{Loc}, \text{IJV})$, the foreign players could be US, EU, or Japanese and South Korean foreign parents; the local parent is Chinese and the joint venture is either Sino-US and EU or Sino-Japan and South Korea. C_i is the set of strategies

for player i and $u_i: C \rightarrow \mathbf{R}$ is the utility payoff function for player i . For our purpose, we use the set of strategies for each player as {(choose senior management locally, choose senior management from Foreign parent); (contribute finance; contribute local production); (offer ownership share, do not offer ownership share)}. In terms of utility payoff functions, we focus on the longevity of the IJV.

This part of the configuration between the parents marks a crucial step towards clustering the foreign partner as the headquarters (HQ) and the local partner as host in relation to the countries where the parents have different levels of LTO. Thus, the general classification of IJV parents as having origins in the US, the EU, Japan and South Korea leads to significant implications with regard to senior management control, and information asymmetries.

Let us now move to consider senior management's choices in a strategic form game with complete information. Player I (Chinese parent) and Player II (Japanese or Korean parent) simultaneously move and offer their choice of senior management. The set of strategies C_{China} for player I and $C_{\text{Japan/Korea}}$ for player II and u_{China} is the utility pay off function for the Chinese parent and $u_{\text{Japan/Korea}}$ for player II. The payoffs are using the longevity of the IJV based on Hofstede's LTO index for the chosen countries. We assume that LTO is a good indicator for the payoffs which will be measured in years for the longevity of IJVs.

We choose the simultaneous move situation to show the conflict between self-interest and cooperative behavior which is typical of an IJV. As these are the relevant questions in the start-up phase of an IJV, we use this to show the situation of partners who do not know each other and have no reputational effect to base their partner selection on. The Chinese and

foreign parents have two strategies (Chinese senior management, Japanese/Korean senior management) with the payoffs $\{(10,10), (15,0); (0,15); (9,9)\}$ presented in Table 1.

Insert Table 1 near here

The results of the game show that there exists a Pareto-optimal solution (10, 10) for the choice of the Chinese senior management, as this affects the length of the IJV, which means that no player is better off than the other. Japanese/Korean senior management is likely to have a slightly shorter time horizon (9, 9). Even so, Japanese and Korean LTO (80 and 75) is higher than all other possible foreign parents from the TRIAD region, but still below China's LTO (118). We have chosen the longevity of the IJV (in years) as a pay-off and the strategies of the players (parents) were either to choose senior management from the local or foreign parent. The longevity of the IJV is dependent on the decisions of a Chinese senior management team, shown in Table 2.

Insert Table 2 near here

Similar to the Sino-Japanese JVs, we choose the pay-offs equivalent to the LTO for US-EU (29 for the USA; within the EU, ranging from 20 in the UK to 32 in Poland) and again the Chinese LTO for a Chinese Senior management with ten years in equilibrium. Instead of choosing a US-EU senior management which will bring about duration of five years (the normal length of Sino-Western JVs), the solution goes clearly for a ten year longevity with Chinese senior management.

In strategic form, it pays off to choose a Chinese senior manager due to access to local expertise, knowledge of bureaucracy and legal requirements for control rights. In terms of long-term and short-term perspectives, the payoffs are considered under the assumption that the Chinese senior management contributes to the length of an IJV. We have formally shown how the LTO of senior managers is likely to affect the longevity of IJVs, and predict that foreign partners from a country with a low LTO tend to have a short longevity of IJVs with Chinese partners. Hence, based on the results, we derive two propositions below.

Proposition 1a: The longevity of Sino-Foreign JVs is positively associated with the degree of management control by Chinese senior managers.

Proposition 1b: The longevity of Sino-Foreign JVs is negatively associated with the degree of management control by foreign senior managers.

3.2 Extensive Form Games or Dynamic Games with Complete Information

The next level of the analysis embraces control rights, contributions and management decisions in a multi-person decision-making situation of complete information. The key features of the following dynamic games with complete information are that the players move in sequence, all previous moves are observed before the next move is chosen, and the payoffs for the players are common knowledge.

Assumption: The players know each other and their preferences, but do not know their moves yet. It is a sequential move game with a leader-and-follower situation (Stackelberg Equilibrium).

The extensive form game has the following notation, and we will adapt it for the IJVs in China:

$$\Gamma^e = (N, S^*, (C_i)_{i \in N}, (u_i)_{i \in N})$$

where N is the set of players. In our case $N = (\text{For}, \text{Loc}, \text{IJV})$, the foreign players FOR are considered to be US-American, European, Japanese and South Korean foreign parents, the local parent LOC is Chinese, and the joint venture is either Sino-US/EU or Sino-Japanese/Korean. Let S^* be the information node, C_i is the set of strategies for player i and $u_i: C \rightarrow \mathbf{R}$ is the utility payoff function for player i . We use a set of strategies for each player as {(offer ownership share, do not offer ownership share); (choose shared management, choose dominant parent management); (choose senior management from Local, choose senior management from Foreign parent); (contribute finance; contribute local production); (set up R&D unit, set up Distribution unit)}.

Considering the contributions to the IJV, the parents can theoretically contribute either technology, marketing or finance or each of these three contributions together (Ott, 2006). In this context the configuration of the parents could look like the following matrix:

Insert Table 3 near here

$$P_{\text{Contribution}} (P_L, P_F) = \{(CT, CT), (CT, CM), (CT, CF), (CM, CT), (CM, CM), (CM, CF), (CF, CT), (CF, CM), (CF, CF)\}$$

The contributions of the parents are necessary because of their impact on ownership ratios, bargaining power, return on investment and the strategic configuration of the IJV itself, see below. The local and foreign parent could each contribute technology (research lab),

marketing (marketing units, distribution) or finance (contractual IJV). The financial contributions could lead to a particular strategic configuration in which one parent just intends to achieve a particular rate of return on investment, whereas the other contributes to the value-adding process. For our purposes, we would like to investigate the effects of local contributions being local production P and finance F and of foreign contributions being technology T and finance F. These combinations have not been modeled and analyzed so far. In this paper, we focus on $P_{\text{Contribution}}(P_L, P_F) = \{(c_P, c_T), (c_P, c_F), (c_F, c_T), (c_F, c_F)\}$. We use the contributions for the sequential equilibrium concept to show their influence on control and senior management choices.

The order of the play specifies the sets of strategy for each information node. In terms of utility payoff functions, we focus on the longevity of the IJV. The extensive form game with a sequential equilibrium concept shows the response function of Player 2, after Player 1 moved first. We can therefore model the interactions between the Chinese local firm and the second player being the foreign firm from Japan, Korea, US or EU.

3.2.1. Extensive Form Games for the Choice of Senior Management

Insert Figure 2 near here

We can therefore show the order of the play for the game above as:

- 1) Player 1 chooses an action c_1 from the feasible set C_1 .
- 2) Player 2 observes c_1 and then chooses an action c_2 from the feasible set C_2 .
- 3) The payoffs are $u_1(c_1, c_2)$ and $u_2(c_1, c_2)$.

We solve this game by backward induction, which means that player 2 (foreign) moves at the second stage of the game with player 1 having chosen c_1 before her.

$$\max_{c_2 \in C_2} u_2(c_1, c_2) \quad (1)$$

Assuming that for each action c_1 from the feasible set C_1 , player 2 has a unique solution $R_2(c_1)$, then this is player 2's reaction function to player 1's move. Since player 1 can do the same, she could anticipate player 2's reaction to each action:

$$\max_{c_1 \in C_1} u_1(c_1, R(c_1)) \quad (2)$$

Player 1's optimization outcome is c_1^* and the outcome of this game is $(c_1^*, R(c_1^*))$

The equilibrium would be (10,10) if we use the same years of duration as payoffs for the extensive form game, as for the static game, only with a sequential move structure.

3.2.2. Extensive Form Game for the Interaction between Contribution and Senior Management

Insert Figure 3 near here

We can therefore show the order of the play for the game above as:

- 1) Player 1 (Local) chooses from the strategy set c_1 (production, local knowledge)
- 2) Player 2 (Foreign) observes c_1 and then chooses an action c_2 (finance, technology) from the feasible set C_2 .

3) Player 1 (Local) observes player 2's choice (and recall her own choice in stage 1) and then chooses an action c_3 (production unit, senior management).

4) Payoffs for both players (U_{China} ; U_{Foreign})

Let player 1 (Chinese) move first by choosing a contribution: production or local knowledge. Player 2 (Foreign) will move with a contribution of either finance or technology. Player 1 can then move further choosing a local production unit with technology or choice of senior management with player 2's finance contribution. We solve the game by beginning with player 1's second move in which either production unit or senior management will be her choice. The decision is dependent on player 2's move to provide either finance or technology which is again dependent on whether the local player provides production or local knowledge. For player 1, it would make sense to contribute production knowledge for a production unit and local knowledge via providing the senior management consistent with our assumption that access to local knowledge should happen through local senior management. This would mean that the local player would only be better off in these cases and otherwise have a 0 pay-off. The response function for player 2 would be like in the previous case

$R_2(c_1)$. We will, therefore, have for player 1 the following response function to consider $R_3(c_1, c_2)$ and therefore $R_3(c_1, R_2(c_1))$.

Assuming that for each action c_1 from the feasible set C_1 , player 2 has a unique solution $R_2(c_1)$, then this is player 2's reaction function to player 1's move. Since player 1 can do the same, she could anticipate player 2's reaction to each action:

$$\max_{c_1 \in C_1} u_1(R_3(c_1, c_2); R_2(c_1)) \quad (3)$$

or

$$\max_{c_1 \in C_1} u_1(R_3(c_1), R_2(c_1)); R_2(c_1)) \quad (4)$$

Player 1's optimization outcome is c_1^* and the outcome of this game is $(R_3(c_1^*), R_2(c_1^*), R_2(c_1^*))$

We can interpret the results of the model above in the following way. The contributions from parent organizations may be associated with the longevity of IJVs (Yan and Gray, 1994). We expect that the longevity or stability of IJVs depends on the resources contributed by each parent firm. More specifically, the type of resources contributed will reinforce a parent's expectation of control over the joint venture's operation. In other words, if a parent makes extensive contributions of finance, the parent will expect a high level of control, and hence, influence the longevity of the IJV. The extent to which a foreign parent provides finance and the local parent contributes to local production influences the stability of IJVs. There is not only a direct impact, but also an interaction effect between contributions made by both parent companies and management control. The more production contributed by a local parent, the smaller role played by local Chinese senior managers in the stability of IJVs. Production from a local parent offsets the role of local senior managers in maintaining IJVs' stability. On the other hand, the more finance contributed by foreign partners, the more likely it is that foreign senior managers desire a longer longevity of IJVs. Hence, we can derive the following propositions related to parents' contributions and the interaction effects between contributions and management control by different JV partners.

Proposition 2a: *The longevity of Sino-Foreign JVs is positively associated with the contribution to production by the local Chinese JV parent.*

Proposition 2b: *The longevity of Sino-Foreign JVs is positively associated with the contribution to finance by foreign partners in JVs' configuration.*

Proposition 3a: *Production contributed by a local parent negatively moderates the role of Chinese senior managers in the longevity of IJVs.*

Proposition 3b: *Finance contributed by foreign partners positively moderates the role of foreign senior managers in the longevity of IJVs.*

4. Data Analysis

In this section, we mainly test the propositions derived from the game models. We examine whether the role of Chinese and foreign senior managers in IJVs and the interaction effect between contributions and senior managers affect the longevity of IJVs. Similarly, whether the contributions from both parties have an impact on the longevity is also investigated. We are particularly interested in whether Chinese partners put more emphasis on stability, or the foreign senior managers would prefer to have a short duration of IJVs.

To obtain data to test the propositions derived from the theoretical models, we conducted a postal questionnaire survey of Sino-Foreign JVs in a single survey from December 2006 to April 2007. An abbreviated list of the main questions is provided in the appendix. We limited the sample to high-tech industries in order to control for the impact of industrial affiliation on strategic decisions across the three nationalities of IJVs. In addition, we controlled for industrial sub-sectors within the high-tech sector. We obtained useable responses on the

longevity of IJVs and ownership as well as strategic configurations in production, R&D and marketing within IJVs. Three cities, Beijing, Tianjin and Qingdao, were surveyed due to the concentration of particular types of IJVs in these regions. Specifically, Japanese and Korean JVs mainly locate in the Pan Bohai region that includes these three cities, accounting for 67% of Korean investment and 40% of Japanese investment in China (Wang, 1998). Selecting the sample firms from the three cities enabled us to avoid the problem of the under-representation of Sino-Korean JVs in other regions. According to lists obtained from Beijing, Tianjin and Qingdao Industry and Commerce Bureaus, in 2006 there were 2,126 IJVs in Beijing, 1,075 in Tianjin and 461 in Qingdao. Each of these IJVs was approached, and a willingness to participate in this survey was indicated by 2,053 IJVs, together representing 56% of the IJV population in these three cities.

It is commonly recognized that research design and data collection cannot apply to different countries in precisely the same way due to cultural differences (Mullen, 1995; Singh, 1995; Cavusgil and Das, 1997). Thus, it is necessary to consider the issue of data equivalence in research design and data collection. In order to achieve conceptual and cultural equivalence, we have taken some steps following previous studies (Luk et al., 2005).

First, we consulted our Chinese research collaborators at an early stage of the questionnaire's development and asked them to confirm whether the issues, such as cultural differences and duration of IJVs, exist and are interpreted similarly in China. Our research collaborators confirmed the existence of such issues and also provided some related studies published in Chinese journals, indicating that the theme of our research has already been established in China. Second, we paid great attention to language and context comparability. For example, the questionnaire was translated from English into Mandarin Chinese. Then it was back-translated by three Chinese Professors in Beijing to ensure its validity and accuracy. Third, a

pilot study was carried out in two workshops, involving groups of 6 and 8 senior managers of three categories of Sino-Foreign JVs. These senior managers completed the questionnaire and identified ambiguous questions. We modified the questionnaire accordingly, based on the feedback received from the workshops, and copies were mailed to 2,053 IJVs.

Two professional research assistants in Beijing were engaged to conduct postal questionnaire surveys during 2006-2007. Given the subject of this investigation, a key informant approach was adopted, with the respondent being the CEO or senior manager of the surveyed IJVs. The research assistants made follow-up phone calls and visits to about 100 firms. A total of 213 useable questionnaires were received (a 10.4% response rate for the sample surveyed) with 104 IJVs with US-EU partners and 109 IJVs with other Asian co-owners (Japan and Korea).

The possibility of non-response bias was checked by comparing the characteristics of the respondents with those of the population. The calculated t-statistics for the number of employees and local Chinese control were statistically insignificant, indicating no significant differences between respondent and non-respondent firms.

Dependent variable

The longevity of IJVs was measured by the period since the founding of the IJVs until the year when the survey was conducted.

Independent variables

To estimate foreign influence on the longevity of these IJVs, we used the percentage of foreign senior managers and Chinese senior managers on the boards of IJVs as a measure of the degree of foreign and local management control. We also used a dummy variable to

measure the contributions by local JV parent which takes the value of one if a local IJV parent contributes to production of their IJV and zero otherwise. A dummy variable was created based on whether foreign partners contribute to the financing of IJVs, taking the value of one if foreign partners provide finance and zero otherwise.

Control variables.

We controlled for firm size measured by number of employees and also for foreign ownership stakes in IJVs. A dummy variable was created for the national cluster of US-European/Chinese JVs, whereas Japanese-Korean/Chinese JVs were used as a baseline. As the questionnaire survey was conducted in different cities, we also controlled for location by introducing two dummy variables for Tianjin and Qingdao. We also included industry dummies in the estimation and detected IJVs' configurations in terms of whether they had joint marketing units. We created a dummy variable which took the value of one if an IJV had a marketing unit and zero otherwise.

Common methods variance may be a potential problem when the data are generated from the same respondents of an organization at the same time. To minimize the effect of common method variance, we took the following steps. First, the dependent variable, the longevity of IJVs, can be independently verified from other sources and thus is "objective" in nature. We also ensured the anonymity of the respondents to reduce evaluation apprehension (Podsakoff et al., 2003). Second, the survey uses multiple item constructs. Response biases are more likely to occur at the item level than at the construct level. Third, the main hypotheses involve interaction effects. Complex relationships between the dependent and independent variables are not part of the respondents' theory-in-use (Chang, Witteloostuijn and Eden, 2009). This helps reduce the risks of common method variance. Finally, common methods bias was tested by performing the single factor test proposed by Podsakoff and Organ (1986). We conducted

a factor analysis with all the variables used in this study and obtained a four-factor solution. The largest factor explained only 26.58% of the variance. Hence, common methods bias is not a major concern in our data.

To test the above-mentioned propositions, we adopted a count model approach as the dependent variable (the longevity of IJVs) is a non-negative number. We estimated the Poisson regression model first and then tested for over-dispersion. The result based on the approach suggested by Wooldridge (1990) shows evidence of over-dispersion as the coefficient of the predicted dependent variable is statistically significant at the 0.05% significance level. Therefore, we estimated a negative binomial model (Green, 1997).

The descriptive statistics for the variables used in the analysis and the matrix of correlation are presented in Table 4 and show the average longevity of IJVs (nearly 10 years) and size of firms (481 employees) in the sample. Foreign partners, on average, account for 56% of IJV ownership. The average number of senior Chinese and foreign managers (of different nationalities) in each IJV is six and four. We also checked for multicollinearity using variance inflation factors (VIFs) which are well below 10, showing that multicollinearity is not a concern in our estimations.

Insert Tables 4 and 5 here

We included the main independent variables first and then added interaction terms between senior management, production contribution and financial contribution by local and foreign partners. The results presented in the full model (Model 4) in Table 5 show that the longevity of IJVs is positively associated with the variable of mainland Chinese senior managers in

IJVs. This result ($\beta=0.028$; $p<0.01$) indicates that the extent of Chinese management control has a significant, positive impact on the length of IJVs. Hence, the result is in line with Proposition 1a. This suggests that other things being equal, a 1% increase in Chinese management control leads to an increase in IJV longevity by 2.8% ($e^{(0.028)}-1=0.028$). Moreover, the results suggest that the percentage of foreign senior managers in Sino-Foreign IJVs has a negative association with the longevity of IJVs and is statistically significant ($\beta = -0.042$; $p<0.01$). This result shows that others being equal, a 1% increase in foreign senior management reduces IJV duration by 4.3% ($e^{(0.042)}-1=0.043$). Thus, Proposition 1b is supported. The results indicate that foreign senior managers from countries with a low level of LTO are associated with a short longevity of IJVs, whereas Chinese senior managers prefer stability and support longevity in IJVs. Taken together, we report consistent evidence which suggests a link between the longevity of IJVs and management control by partners from countries with different levels of LTO.

The variable of the contribution to production by local Chinese JV parents ($\beta=0.308$; $p<0.01$) is positive and statistically significant, suggesting that the contribution to production by local JV parents is a decisive factor affecting the longevity of IJVs. Hence, we have obtained supporting evidence of Proposition 2a. Specifically, 1% increase in the contribution to production by local Chinese JV parents increases IJV duration by 36.1% ($e^{(0.308)}-1=0.361$). Finance contributed by foreign partners is positive and statistically significant in Model 1 and Model 2, but insignificant in the full model (Model 4). Thus, Proposition 2b is partially supported. There are also interaction effects between contributions and commitment made by the two partners and management control. It is intriguing to find that production contributed by a local JV parent negatively moderates the impact of Chinese senior managers on the longevity of JVs ($\beta=-0.031$; $p<0.01$), whereas finance contributed by a foreign partner

positively moderates the role of foreign management control and encourages longevity once a foreign partner has made substantial commitments to an IJV ($\beta=0.047$; $p<0.01$). Hence, Propositions 3a and 3b are fully supported. The results suggest that production contributed by a local JV parent reduces the impact of Chinese senior management on the duration of IJVs by 3.2% ($e^{(0.031)}-1=0.032$), whereas financial contributions by a foreign partner mitigates the negative impact of foreign senior management by increasing IJV duration by 4.8% ($e^{(0.047)}-1=0.048$). The joint marketing unit in IJVs' configurations is positively associated with the stability and longevity of IJVs.

In terms of the firms' own characteristics, the results show a positive and significant association between size and the longevity of IJVs, suggesting that IJVs with a large size are more likely to exist for a long period. However, foreign ownership has a negative, significant impact on IJVs' survival time. IJVs with a joint market unit tend to have an extended longevity. As shown in Table 5, adjusted R-squared is about 11% in our based line model and this figure has increased to 14% when interaction terms are considered.

5. Discussion

This study focuses on the factors affecting the longevity of IJVs in China and investigates the strategic interactions of the players in an IJV (foreign parent, local parent and IJV management) by adopting game theory and empirical analysis based on national perceptions of time horizons. The findings from our research have some theoretical, empirical and managerial implications.

5.1. Theoretical and empirical implications

First, we have analyzed theoretical models, which formally show that foreign partners from nations with different levels of LTO affect the longevity of IJVs. Our analysis was based on the assumption that culture, contribution and knowledge acquisition are the important factors contributing to the longevity of IJVs. The conceptual framework was complemented with a game theoretical treatment of the strategic interactions of the parent firms in IJVs. Sino-Foreign IJVs are characterized by different levels of LTO between the foreign and local players. We used LTO as pay-offs and showed the resulting differences in strategies leading to the longevity of Sino-Foreign JVs. It is our contribution to consider the duration of Sino-Foreign JVs as pay-offs in static and dynamic games.

We develop a Prisoner's Dilemma (static) game for the parent firms when choosing senior management for an IJV (Zhang and Rajagopalan, 2004). This is a necessary step to show the sharing of information between the parents, and how they choose their strategic moves simultaneously. In a simultaneous move situation, the Nash Equilibrium for Chinese parents and their Japanese or Korean counterparts indicates that it is Pareto optimal for the parents to appoint senior management from the local firm as it brings a higher pay-off for both (Casson, 1994; Myerson, 1991; Ott, 2006). The choice of pay-offs reflecting the longevity of the IJV as an outcome for the senior management helps to build a link between the theoretical model and managerial decisions in an IJV.

Second, we have further analyzed the sequential moves of the players in the dynamic game. We chose an extensive form game to show the multi-person decision-making situation. Both players moved first in these games. The strategies of the players reflected the decisions in an IJV such as contributions to the IJV (production, finance) and senior management nationality (Chinese, Foreign). All of these strategy sets were dependent on whether the players

(Chinese, Foreign) have LTO. The pay-offs were measured as the longevity of the IJV (Ott, 2013).

Third, we tested the propositions derived from the theoretical models using firm-level primary survey data. We found that the degree of Chinese senior management control is positively associated with the longevity of IJVs, whereas the extent of foreign senior management control negatively affects the duration of IJVs. The results may reflect the fact that Chinese senior managers with a high level of LTO prefer to have a greater longevity of IJVs than those from the US or EU. These findings show that the longevity of IJVs not only depends on the contributions of the partners as found in prior literature (Inkpen and Beamish, 1997; Lu and Beamish, 2006; Makino et al., 2007), but also the LTO of foreign partners. We have also found that a contribution to production made by Chinese parents has a significant and positive impact on the longevity of IJVs, whereas contributions through finance made by foreign parents have a limited positive and direct impact on the longevity of IJVs.

Fourth, we further investigated the interaction between management control and contributions from parent firms and found compelling results. The contribution made by Chinese parents negatively moderates the impact of Chinese management control. This implies that contributions to production reduce the importance of Chinese senior management control on the longevity of IJVs. When Chinese parents contribute to production, IJVs tend to have a greater longevity, although Chinese managers have less control. Hence, there is a substitution effect between contribution to production and local management control. However, the financial contribution from foreign parents positively moderates the role of foreign management control, showing that the greater the financial contributions, the greater the effect foreign senior management has on the longevity of IJVs. The findings show that the

financial contribution or financial commitment from foreign parents mitigates the role of foreign senior management control in the longevity of an IJV, and this weakens the impact of a low level of LTO on the longevity of an IJV. The interaction results suggest that management control with different levels of LTO and different types of parent contributions jointly determine the longevity of IJVs.

Finally, our study contributes to the discussion concerning foreign and local firms and shows how they can acquire knowledge from each other, learn complementary skills and then exit the IJV (Park, 2011; Yao, et al 2013). Providing foreign partners with access to local knowledge through appointing local senior management will increase the longevity of IJVs since foreign partners are unable to internalize or acquire local knowledge, but instead rely on local senior management to access local knowledge. This implies that sharing local knowledge through local senior management control has a stabilizing effect on IJVs. The findings show that when the local firm offers access to knowledge through the senior management then the IJV lives longer and absorptive effectiveness does not lead to premature break-up.

5.2. Managerial Implications

The theoretical propositions and empirical evidence have valuable managerial implications. The longevity of an IJV in China has always been a prominent topic and termination rates show clearly that this is an issue which cannot be neglected. In order to maintain the stability of IJVs, managers need to consider factors such as senior management control and foreign partners with different levels of LTO which can affect the longevity and stability of IJVs in China. Local senior management control has a direct impact on the stability of IJVs. This is

valuable when it comes to the choice and strength of the JV management and the reported difficulties between the different management groups in IJVs in China (Walsh et al. 1999; Nielson and Nielson, 2011). In addition, the choice of contribution can lead to an additional benefit: if the parent moves from market and/or marketing-related contributions to production, the IJV should be more stable. Overall, it seems that such start-up decisions have an impact on the longevity of IJVs in China.

Similarly, a shift from local knowledge acquisition to local knowledge access constitutes a strong source of stability. Setting up an IJV is easier when local knowledge is complemented by other sources of knowledge such as marketing, technology and management. Western parent firms need to take a long-term perspective and adopt their strategies to a longer time horizon when forming a Sino-Foreign JV. Overall, the endogenous factors of contributions and senior management control, as well as LTO, lead to the longevity of an IJV.

5.3. Limitations and Future Research

We should acknowledge some limitations of the study. First, we tested the theoretical propositions using cross-sectional data. In future studies, insightful findings may be drawn by conducting longitudinal data analysis to capture the dynamic dimension of factors affecting the longevity of IJVs. Second, while our study is based on an implicit assumption that LTO, as a distinctive feature of Chinese culture, plays a crucial role in the longevity of IJVs, other dimensions of national culture, such as power distance, collectivism and uncertainty avoidance may also affect the longevity of IJVs. Future research should consider the impact of multiple dimensions of national culture on this issue. A related point is that this study has mainly focused on the impact of a distinctive feature of Chinese culture on the duration of IJV and has provided a detailed analysis of the relationship between long-term orientation

and the stability of IJVs in China. However, other factors may also affect this relationship, e.g. the age of founders or provincial regulations on IJVs. This may be one of the reasons for a relatively low R-squared in our estimations. Future research should consider other factors which affect the longevity of IJVs. Third, focusing on the longevity of Sino-Foreign JVs, we are unable to distinguish unplanned termination or failed IJVs due to data availability. Future studies should examine the determinants of both survival and failure of IJVs simultaneously. Finally, although our test shows that the common methods bias is not a major concern, we still need to recognise this as a limitation of our study, given that the data of our study were generated from the same respondents at the same time. Future studies should use data from different sources, such as survey based data and secondary data to minimize the impact of common method variance.

6. Conclusions

This study is one of the first to examine the longevity of IJVs by applying a theoretical approach and empirical tests. We argue that the study extends the extant literature in three main ways. First, by constructing game theoretical models we have provided theoretical insights into the determinants of IJV longevity. These theoretical propositions help to extend the existing literature which has overlooked the inter-play of factors affecting the longevity of IJVs (Hennart and Zeng, 2002; Park and Ungson, 1997).

Second, most existing research tends to take the longevity of IJVs as given when examining their stability and performance (Child and Yan, 2003; Fey and Beamish, 2001; Lu and Xu, 2006; Makino et al., 2007). Deviating from prior studies, we investigate how senior management control with different national levels of LTO and contributions made by parent

firms affect the longevity of IJVs, thus providing new insights into the factors affecting the longevity of IJVs. We demonstrate this initially using theoretical modeling, and then we provide empirical evidence, which supports our theoretical propositions. The application of simultaneous move games and sequential move games in IJVs showed the strength of a prescriptive approach as a basis for empirical investigation. In doing so, we fill a significant research gap, where existing studies have over-emphasized empirical tests without any theoretical foundation. The empirical findings are consistent with the theoretical predictions. This contributes to the literature by indicating that a game theoretical approach can help managerial multi-person decision making.

Third, we have further examined the interactions between management control and contributions from IJV parents. The findings add a new dimension to determinants of the longevity of IJVs. They also show that longevity depends upon a complex inter-play between management control with different degrees of LTO and contributions made by parent firms. In particular, the results highlight the importance of local knowledge access through local senior management control in the survival of IJVs. We were able to theoretically and empirically distinguish between the effect of knowledge acquisition and knowledge access contributing to longevity of IJVs. We found that IJVs which provide knowledge access via local senior management last longer. The differential effect of access to, and acquisition of, local knowledge emphasizes and provides a new explanation for the longevity of Sino-Foreign JVs (Buck, Liu and Ott, 2010; Yao et al., 2013).

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Table 1: Prisoner's Dilemma for Sino-Japanese JV - choice of senior managers, simultaneous moves

		Japanese/Korean partner	
		Senior Manager Chinese Japanese	Senior Manager Japanese
Chinese partner	Senior Manager Chinese	<i>(10,10) NE</i>	(15,0)
	Senior Manager Japanese and Korean	(0,15)	(9,9)

Table 2: Prisoner's Dilemma for Sino- US/EU JVs

		US/EU partner	
		Senior Manager Chinese US	Senior Manager US
Chinese partner	Senior Manager Chinese	<i>(10,10) NE</i>	(12,0)
	Senior Manager US/EU	(0,12)	(5,5)

Table 3: Contributions of Parent firms

Local firms	Foreign firm		
	Technology	Marketing	Finance
Production	(CT, CT)	(CT, CM)	(CT, CF)
Market Knowledge	(CM, CT)	(CM, CM)	(CM, CF)
Finance	(CF, CT)	(CF, CM)	(CF, CF)

Source: Ott (2006)

Table 4: Descriptive statistics and correlation matrix

	Mean	Std. Dev	1	2	3	4	5	6	7	8	9	10	
1. Longevity	9.906	6.387	1.000										
2. Chinese Senior managers	0.622	0.222	0.226	1.000									
3. Foreign Senior managers	0.377	1.472	0.109	0.389	1.000								
4. Contribution: production	0.906	0.292	0.046	-0.115	-0.099	1.000							
5. Contribution: finance	0.451	0.526	0.108	-0.065	-0.014	0.027	1.000						
6. US-European and Chinese IJV	0.488	0.501	-0.037	0.128	-0.039	-0.039	0.023	1.000					
7. Foreign ownership stakes	0.572	19.687	-0.055	-0.109	0.117	0.137	-0.031	-0.102	1.000				
8. Joint marketing unit	0.155	0.363	0.088	0.059	0.088	-0.040	-0.029	0.127	0.073	1.000			
9. Size	4.844	1.341	0.266	0.418	0.352	0.010	-0.111	-0.045	-0.0126	0.008	1.000		
10 .Tianjin	0.291	0.455	0.052	-0.021	-0.029	-0.254	0.194	-0.026	-0.039	-0.160	-0.089	1.000	
11. Qingdao	0.169	0.376	-0.175	0.015	0.139	-0.069	0.059	-0.165	-0.016	0.015	0.028	-0.289	1.000

Table 5: Determinants of the longevity of IJVs

Independent Variables	Model 1	Model 2	Model 3	Model 4
P1a: The percentage of Chinese senior managers on the board	0.011*** (0.003)	0.023*** (0.005)	0.008* (0.003)	0.028** (0.010)
P1b: The percentage of foreign senior managers on the board	-0.010*** (0.005)	-0.009* (0.005)	-0.025*** (0.006)	-0.042** (0.014)
P2a Contribution by local JV parent: Production	0.141** (0.069)	0.283*** (0.065)	0.103* (0.042)	0.308** (0.115)
P2b: Contribution by foreign partner: Finance	0.200*** (0.069)	0.374*** (0.096)	0.073 (0.075)	0.076 (0.166)
P3a Production Contributed by local JV Parent x the percentage of Chinese senior managers on the board		-0.017** (0.006)		-0.031** (0.012)
P3b Finance contributed by foreign partner x the percentage of foreign senior managers on the board			0.025*** (0.006)	0.047** (0.015)
Control variables				
Dummy for EU-US IJVs	-0.030 (0.077)	-0.055 (0.047)	-0.010 (0.040)	-0.034 (0.081)
Foreign ownership stakes in JVs	-0.004*** (0.002)	-0.005*** (0.001)	-0.004*** (0.001)	-0.005** (0.002)
JV configuration: Joint marketing unit	0.175*** (0.078)	0.227** (0.060)	0.157** (0.043)	0.182† (0.106)
Size	0.0002***	0.0001***	0.0002***	0.0003**

	(0.000)	(0.000)	(0.000)	(0.000)
	-0.291**	-0.357**	-0.293***	-0.296**
Location for Qingdao	(0.094)	(0.071)	(0.059)	(0.114)
	0.046	0.074	0.059	0.060
Location for Tianjin	(0.075)	(0.055)	(0.044)	(0.096)
	2.133**	2.010**	2.267**	2.204**
C	(0.149)	(0.134)	(0.093)	(0.223)
Industry dummies	Included	Included	Included	Included
Adjusted R-squared	0.112	0.128	0.132	0.141
Observations	213	213	213	213

Note: ***, **, * and † represent the 0.01%, 1%, 5% and 10% significance levels.

FIGURES:

Figure 1: Main route to Longevity of Sino-Foreign JVs

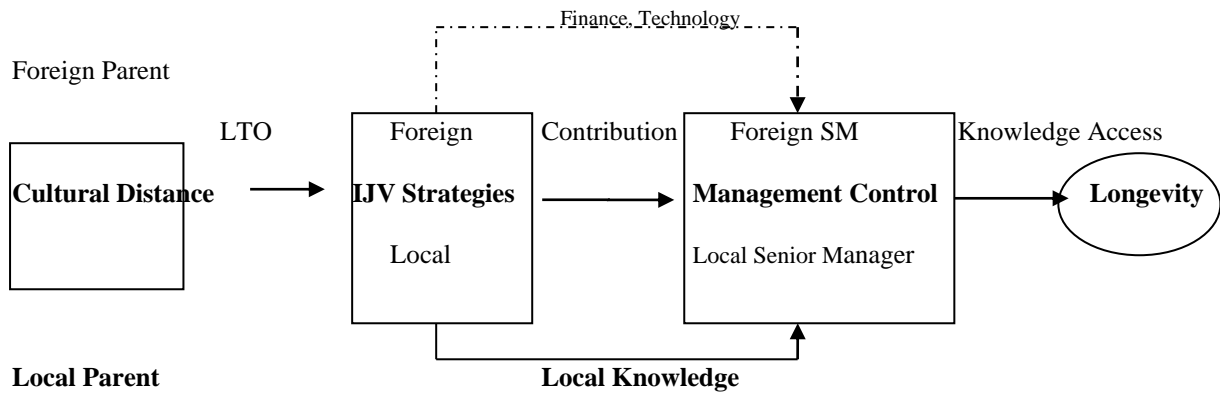


Figure 2: Choice of Senior Management in Sequential Moves

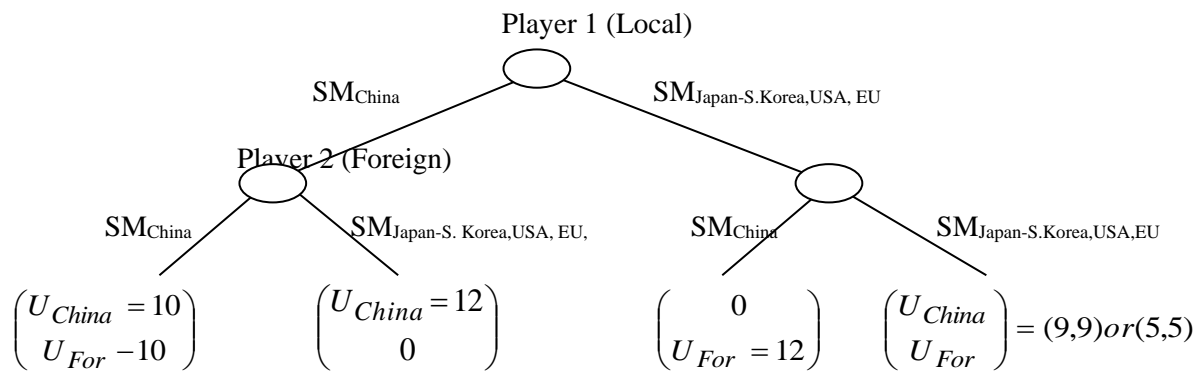
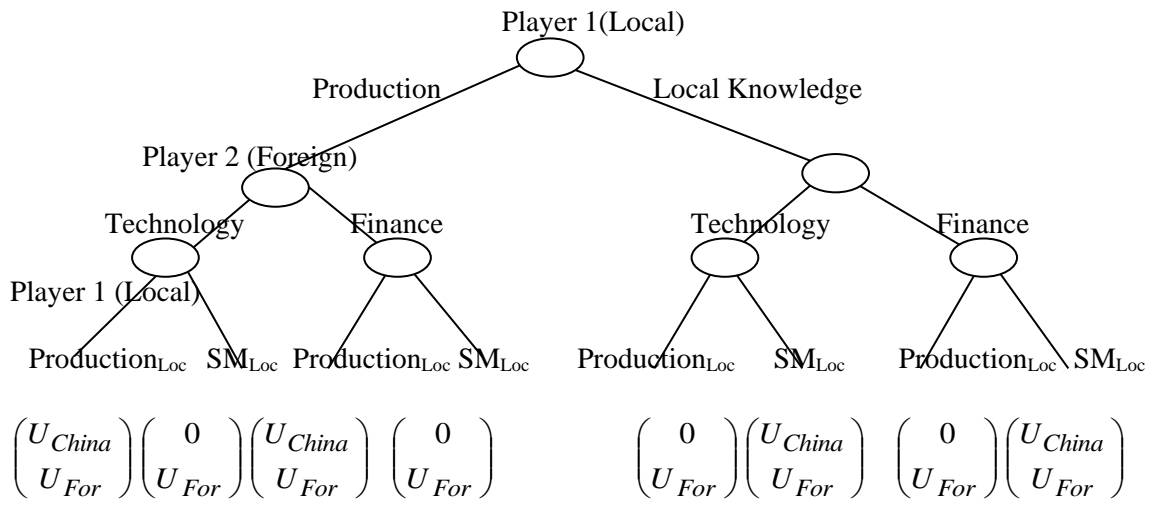


Figure 3: Interaction between the Contributions and Choice of Management



APPENDIX:

Chinese-IJVs in High-Tech industry in Beijing, Tianjin and Qingdao

A1. Name of Chinese-IJV and city:

A2. Name and nationality of senior manager respondent:

A3. Name of JV parent firm(s), their national origins and website address (if any)

A4. How many years has the company been established?

A5. How many employees does the company have currently?

A6. The percentage of expatriates in total employees?

A7. The percentage of local managers in total employees?

A8. How many Chinese senior managers on the board?

A9. How many foreign senior managers on the board?

A10. Current ownership stakes in JV by nationality: Investment by Chinese partner_____%

A11. Current ownership stakes in JV by nationality: Investment by foreign partner_____%

A12. Contribution by foreign JV parent:

a) Finance

b) Technology

c) Foreign marketing

A13. Contribution by local JV parent:

a) Local knowledge

b) Local Marketing

c) Production

A14. JV configuration (tick boxes)

Does your JV have a:

a) Joint Research Unit?

b) Joint Production or Service Provision Unit?

c) Joint Marketing Unit?

d) Joint Distribution Unit?