The effect of foreign partner network embeddedness on international joint venture failure: Evidence from European firms' investments in emerging economies

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A R T I C L E   I N F O

A B S T R A C T

Access to trusted information about potential local partners is a critical factor for international joint venture (IJV) stability and success in emerging economies. We build on social network theory and examine how foreign investors can benefit from their alliance networks in accessing reliable information on the availability, resources, and behavior of potential local IJV partners. More specifically, we examine positional embeddedness in networks and network density and how these factors help foreign firms mitigate behavioral uncertainty in IJVs and thus reduce the likelihood of failure. We use data on 349 IJVs formed by 132 European firms in emerging economies during the 1995–1997 period and event history analysis to test our hypotheses. Our findings indicate that having an alliance network is a necessary but insufficient condition to mitigate behavioral uncertainty of local partners. We find that only densely tied networks offer benefits of reliable information on potential local partners that ensure the longevity of IJVs and that a central position in an alliance network translates into lower IJV failure.

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1. Introduction

Joint ventures (JVs), i.e. separate organizational entities formed and managed by two or more independent partners (Kogut, 1988, 1989), are a common device for entering into emerging economies (Luo, Shenkar, & Nyaw, 2001; Meschi & Riccio, 2008; Yan, 1998). From a foreign investor's perspective, a key concern in international joint ventures (IJVs) is the mitigation of collaboration hazards related to the unpredictability of the local IJV partner's behavior after the formation phase (Burgers & Padgett, 2009; Das & Teng, 1999; Parkhe, 1993).

IJVs in emerging economies are particularly challenging because the turbulent political, institutional, and economic conditions increase the likelihood of such collaboration hazards (Burgers & Padgett, 2009; Fang & Zhou, 2010; Yan, 1998) and negatively affect an IJV's transaction costs, stability, and outcome (Gulati, 1995b). Often, enforcement of restrictive local regulations on foreign direct investment, greater risks of government expropriation, or more government corruption increase the bargaining power of local IJV partners and likelihood of negative IJV outcomes such as termination before goal achievement, sell-off to the local partner, or buy out by a third party (Hennart, Kim, & Zeng, 1998; Makino, Chan, Isobe, & Beamish, 2007; Meschi & Riccio, 2008; Valdés-Llaneza & García-Canal, 2006).

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Alliance networks can help mitigating partner related collaboration hazards because they represent a reliable source for information on potential IJV partners (Gulati & Gargiulo, 1999; Walker, Kogut, & Shan, 1997). Research that has focused on the role of alliance networks in providing such information has predominantly examined the role of industry-level alliance networks (i.e., alliances among firms in one industry) during the alliance formation phase. Firms' positional embeddedness in such networks and the underlying network structure are key antecedents for alliance formation because they enable information exchange concerning potential partnering opportunities and firms' behavioral track records (Ahuja, 2000; Gulati, 1995a, 1995b, 1999; Gulati & Gargiulo, 1999; Gulati, Nohria, & Zaheer, 2000; Kogut, Shan, & Walker, 1992).

When it comes to understanding alliance failure, however, research on the role of alliance networks has been surprisingly absent. Most research focusing on failure has taken the individual alliance as the unit of analysis and has examined antecedents such as the equity distribution between the partners, partner asymmetries, inter-partner trust, organizational complementarity, cross-cultural differences, alliance scope, rivalry between the partners, and governance structures (Geringer & Hebert, 1989; Gulati, 1995b; Hennart & Zeng, 2002; Nakamura, 2005; Park & Russo, 1996; Park & Ungson, 1997; Parkhe, 1993; Yamin & Golesorkhi, 2010). Only recent research has taken a first step in investigating the effect of industry-level networks on JV dissolution by analyzing the impact of the asymmetry in JV partners' positional embeddedness (Polidoro, Ahuja, & Mitchell, 2011).

The approach of taking industry participation as the key criterion for network boundary definition and network actor inclusion, however, excludes certain relationships and thus limits the generalizability of what we know about the role that alliance networks play. While this approach is suitable for explaining issues such as industry dynamics, competition, and performance heterogeneity (Bae & Gargiulo, 2004; Baum, Calabrese, & Silverman, 2000; Yang, Lin, & Peng, 2011), it is less so for examining a network of alliances between a set of firms that share attributes relevant from an international business and foreign market entry perspective, such as for example the same region of origin or cultural background. Such a perspective is indeed relevant because foreign investors from the same geographic region frequently enter the same foreign markets, partner with the same local firms, and are facing the same regulatory constraints (Goerzen & Beamish, 2005) and thus may take similar benefits from embeddedness in an alliance network. Moreover, the industry-level alliance network perspective ignores that in today's business landscape most firms maintain alliance networks comprised of multiple simultaneous ties to partners from various industries (Wassmer, 2010). An industry perspective, therefore, falls short of capturing interfirm ties beyond the focal industry and thus provides an incomplete picture of how alliance network embeddedness affects alliance outcomes such as dissolution (Goerzen & Beamish, 2005; Rowley, Behrens, & Krackhardt, 2000; Zaheer, Gözübüyük, & Milanov, 2010). For that reason, the alliance network boundary definition in this study takes an extended IJV ego-network perspective (Goerzen & Beamish, 2005; Reuer, Park, & Zollo, 2002; Reuer & Ragozzino, 2006) and includes all direct and indirect ties between foreign investors from the same region of origin (i.e., European Union).

The objective of this study is to extend the prior literature and examine the link between the network of alliances among a set of foreign investors that share the same region of origin and IJV failure. Our study focuses explicitly on IJV failure as the outcome although IJVs may come to an end for other reasons than failure (Lunnan & Haugland, 2008; Makino et al., 2007; Meschi, 2005; Reuer & Zollo, 2005).[2] In line with prior research, we view IJV failure as dissolution or sell-off because both outcomes represent a corrective response to business failure (Geringer & Hebert, 1989; Park & Russo, 1996; Polidoro et al., 2011). Two research questions guide our study: *does a foreign investor's positional alliance network embeddedness affect the failure rate of its future IJVs in emerging economies? What is the impact of alliance network density on the failure rate of IJVs formed in emerging economies by embedded partners?* The crux of our argument is that alliance network embeddedness and network structure specific features provide foreign investors with reliable and useful information not only concerning the availability of potential local partners but also about their reputation, quality of resources, and past behavior (Polidoro et al., 2011). Such information helps to reduce uncertainty and mitigate collaboration hazards (Kogut, 1989; Park & Russo, 1996; Uzzi, 1996) and thus is likely to reduce IJV failure.

In this research, we aim to make three contributions to the literature focusing on the link between alliance networks and IJV failure. First, by applying an alliance network perspective we move beyond the research taking the individual IJV as the unit of analysis and examine how foreign investors' central network positions and specific network structure features can mitigate collaboration hazards with local partners. Second, we move beyond existing industry-level alliance network research that has focused on the relationship between positional embeddedness, network density and alliance failure by examining the network of alliance relationships between foreign investors sharing the same region of origin. Lastly, we provide new empirical evidence of IJVs in the specific context of emerging economies. Examining the role of interorganizational networks as mechanisms to obtain partner information and mitigate collaboration hazards in emerging economies is particularly useful because, in comparison with developed countries, these environments are characterized by additional external uncertainty and a greater likelihood of IJV failure (Burgers & Padgett, 2009; Fang & Zhou, 2010; Yan, 1998). Network embeddedness can help foreign investors mitigate this uncertainty and the hazards related to collaborations with partners for which information is hard to obtain.

The remainder of this paper is organized as follows. In the next section, we develop theory linking alliance network embeddedness, network density, and network position to the likelihood of IJV failure. We then test our theory by using event history analysis and data on 349 IJVs formed by 132 European firms in various emerging economies during the time period

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[2] We thank one of the reviewers for pointing this issue out to us.

1995–1997. We then present our results and conclude with a discussion of the findings, limitations, and future research directions.

2. Background literature and hypotheses

2.1. The termination and failure of IJVs in emerging economies

Various authors have highlighted that alliance terminations fall into the categories of (i) successful collaborations in which the intended goals were achieved, (ii) failed collaborations in which the intended goals were not achieved, or (iii) more neutral outcomes such as contract expirations (Makino et al., 2007; Reuer & Zollo, 2005) and unilateral withdrawal by one partner (also from successful alliances) for reasons not directly linked to the alliance activities (Lunnan & Haugland, 2008).

In the context of emerging economies, there is much less ambiguity in interpreting alliance terminations. By definition, IJVs in emerging economies evolve in an environment whose main features are "[...] the lack of trust between local and foreign partners, the changing dynamics of the IJV partners' relationship, cross-cultural differences in business practices, fast-changing market conditions, and weak institutional and legal environments" (Fang & Zhou, 2010: 906). Such dynamic and uncertain conditions favor a short-term orientation by partners and short IJV time horizons, which further enhance the risk of opportunistic behavior. In other words, IJVs in emerging economies tend to be short-lived and often their termination is unplanned and abrupt. In a large majority of cases, IJV terminations represent a failure of the collaboration as they result from an accelerated and unexpected deterioration of the emerging economy's negative features.

More specifically, in the specific context of emerging economies, it is the termination mode that provides more insights into whether an IJV was a success or failure. Failed IJVs tend to be terminated through either dissolution or sell-off by foreign partners (Geringer & Hebert, 1989; Park & Russo, 1996; Polidoro et al., 2011). On the contrary, IJV internalization, the other termination mode, which leads the foreign partner to buy out the local partner's IJV stake, may not be viewed as a proxy for IJV failure as it involves an additional investment and further commitment of the foreign investor to the emerging economy (Reuer, 2000, 2001).

In the alliance literature it is generally accepted that dissolution "[...] usually reflects a business failure or irresolvable conflict between partners" (Polidoro et al., 2011: 209). Dissolution is indeed often the last resort for partners when facing recurrent financial losses within an alliance or when taking full control of the IJV is not feasible (Hennart et al., 1998). However, unlike the IJV dissolution-failure link, the link between failure and IJV sell-off is less clear-cut (Hennart et al., 1998; Meschi, 2005). An IJV sell-off may result from failure but there may also be other rationales such as the foreign partner's need to refocus its business, redeploy its country portfolio, reduce its debt (Meschi, 2005) or sell its stake at a profit (Nadolska & Barkema, 2007). On the extreme end, an IJV sell-off may even be viewed as a success for the selling partner when the intended objectives are achieved earlier than expected and there is, therefore, no reason for keeping the collaboration alive (Hamel, 1991; Inkpen & Beamish, 1997; Lunnan & Haugland, 2008). Furthermore, the institutional environment also plays a critical role in explaining IJV sell-offs. When foreign investors in emerging economies face a sudden deterioration in the institutional environment, they often exercise the exit option written in most IJV contracts (Kogut, 1991).

In summary, although IJV terminations through dissolutions and sell-offs do not necessarily indicate poor IJV performance, in the context of IJVs in emerging economies these two termination modes reflect the failure of the foreign firms' investment in those economies. In this specific context, IJV dissolutions and sell-offs have to be viewed predominantly as a way to partially or totally exit a host country in which the foreign investment's outcomes did not meet the foreign investor's initial expectations. Therefore, for the purpose of this study, we define the likelihood of IJV failure in emerging economies as the probability that a foreign investor's stake in an IJV is either dissolved (through closure or liquidation) or sold off abruptly.

2.2. Alliance network embeddedness and IJV failure likelihood in emerging economies

When entering an emerging economy through an IJV, selecting the right local partner is a critical factor for the IJV's stability and success (Fang & Zhou, 2010; Lu & Ma, 2008; Yan, 1998). Local partners contribute a wide range of resources including access to local markets, distribution channels, personnel, knowledge of local regulations, and government relations (Inkpen & Beamish, 1997; Lu & Ma, 2008). To obtain preferential access to such resources while at the same time mitigating potential collaboration hazards, foreign investors benefit from information about local partners' intentions, resource endowments, prior collaboration experience, and past behavior. Because obtaining such information is often difficult, foreign investors frequently choose complex governance structures such as formal contracts as a way to make up for the lack of reliable partner information and reduce relational risk (Das & Teng, 1999). Being often coercive, such governance structures provide on one side safeguards against future opportunistic partner behavior but on the other side bear high transaction costs because they codify detailed operational specifics of the IJV that are costly to monitor (Williamson, 1975). Moreover, even through detailed formal contracts it is near to impossible to completely mitigate collaboration hazards linked to a local partner. In fact, the implementation of formalized contracts often produces quite the opposite effect. Because of the high transaction costs associated with such contracts, foreign investors tend to have greater expectations for profit, be more demanding, and exert more pressure on their local partners (Yan & Gray, 2001).

Embeddedness in a network of alliances can help foreign investors to obtain preferential access to valuable information on potential local partners (Gulati, 1995a, 1999; Gulati & Gargiulo, 1999; Gulati et al., 2000; Kogut et al., 1992; Zaheer et al., 2010). Generally, repeated ties between alliance network members play a special role in such networks because they increase the reliability of the information about network members (Burt, 1992). Information reliability is also increased when a network member obtains the same information on another network member from more than one source (Granovetter, 1985; Gulati, 1999). Embeddedness in different types of alliance networks, however, is likely to provide different information. For example, embeddedness in a horizontal alliance network may provide information useful from the perspective of industry participants (Ahuja, 2000; Gulati, 1995a; Gulati & Gargiulo, 1999; Kogut, Shan, & Walker, 1992). Embeddedness in an alliance network with firms from the same country or region of origin, on the other hand, may provide useful information from a foreign direct investment perspective (Goerzen & Beamish, 2005). Because the benefits of embeddedness in horizontal alliance networks have been studied extensively, but the embeddedness in networks among players from the same region have not, we focus on the latter. More specifically, we are interested in two types of ties between foreign investors from the same region, i.e., in our case the European Union. First, we focus on direct ties between European foreign investors through IJVs. Second, we also examine indirect ties between these foreign investors through a shared local partner, i.e., scenarios when two or more European foreign investors are tied to the same partner through independent IJVs. Such an alliance network comprised of direct and indirect ties can be considered a peer-level network.

When it comes to entry into emerging economies in which local institutions supporting foreign direct investment are underdeveloped or changing at a fast pace, embeddedness in a peer-level alliance network can be a source of competitive advantage if it provides access to network resources and experience that are relevant in the given market context and that a foreign investor could not obtain otherwise (Gulati, 1999). Direct access to the alliance network members' country experience and knowledge can thus facilitate the efficient access to relevant and reliable information on potential local partners. Because of past deals, alliances, and IJVs, alliance network members represent an effective and trusted source for referrals to potential local partners with a strong reputation and track record. They may also facilitate the identification and selection of a local partner whose resources provide the best match with an IJV's objectives. By tapping into the network's cumulative experience and knowledge concerning a specific country and its local players, a foreign investor will be in a better position to select local partners with a better fit. This in turn is likely to increase the stability of the collaboration and decrease the risk of moral hazard and future inter-partner conflicts, and thus IJV failure. Therefore, in the context of turbulent environments such as emerging economies, the embeddedness of a foreign investor and local partner/s in the same alliance network increases not only the likelihood of IJV formation but also the stability and performance of the IJV. Thus, we hypothesize:

Hypothesis 1. The embeddedness of a foreign investor and its local IJV partner/s in the same alliance network at the time of IJV formation decreases the failure likelihood of future IJVs by the foreign investor in emerging economies.

2.3. Network density, partner network position, and IJV failure likelihood in emerging economies

Other critical explanatory factors, besides network embeddedness, for governance choices in interorganizational collaborations are network density and partners' network positions (Gulati, 1995b). We first discuss the effect of network density on the likelihood of JV failure and then the role of partners' network positions.

Network density is defined as the number of existing ties divided by the maximum number of possible ties between network members (Coleman, 1988). Network density is a key dimension of the network structure and its impact on the quality, relevance, and content of information diffused in the network has been largely debated in the network literature. However, instead of converging toward a widely-accepted conclusion, the debate remains controversial and opposes two streams of network research: a first stream stresses the benefits of dense networks, also referred to as *network closure* (Coleman, 1988, 1990; Reagans & Zuckerman, 2001), while the second stream advocates the benefits of sparse networks full of gaps between members — also defined as *structural holes* — and puts forward the negative aspects of densely-tied networks (Burt, 1992). Because of these opposite predicted effects of network density in the context of IJVs in emerging economies, there are two competing theoretical rationales (see Hypotheses 2a and 2b below).

According to the *network closure* argument, most members in dense networks are inter-connected and thus represent a closed group (Coleman, 1988, 1990). In such a closed group, information exchanges tend to be quicker and easier than within sparse networks (Ahuja, 2000; Coleman, 1988, 1990; Uzzi, 1996). Dense networks facilitate and accelerate information exchanges between network members irrespective of their position. Moreover, dense networks have a positive impact on the availability of information to network members for various reasons. First, dense networks reflect a large amount of common experience among all network members, which is useful for network members to learn about the past behavior and loyalty of potential collaboration partners. In other words, such experience forges the reputation of network members and reduces the behavioral uncertainty of potential partners within and outside the network. The denser the network, the broader and more widely accessible is this base of common experience. Second, trust among members of dense networks tends to be greater. A closed network emerges from the development of repeated ties between network members (Gulati, 1995b). Through repeated ties, network members know each other better and build a foundation of mutual trust. This creates a strong cohesiveness between its members through the development of similar behavior, language and routines (Uzzi, 1996). Dense ties lead to the formation of shared values, codes, and norms within the network. They also mitigate the

risk of free riding and opportunistic behavior among network members by exerting strong group pressure on each member to fulfill commitments and obligations (Coleman, 1988, 1990; Bae & Gargiulo, 2004). As a consequence, strong organizational and cultural cohesiveness between network members help those members circulate, access, and absorb non-distorted and non-costly information. Building on the *network closure* argument, we argue that in the context of IJVs in highly uncertain market environments such as emerging economies, high levels of network density enable embedded foreign partners to benefit fully from the informational configuration of the alliance network. Therefore, we hypothesize:

Hypothesis 2a. The relationship between the density of the alliance network in which a foreign investor is embedded at the time of IJV formation and the failure likelihood of future IJVs by the foreign investor in emerging economies will be negative.

The *structural holes* stream highlights the dangers and pitfalls of dense networks. It argues that the resulting shared norms and values among network members act as organizational filters that ignore or reject all innovative ideas and information (Burt, 1992; Bae & Gargiulo, 2004). These filters only accept and process redundant, conformist, and common information which have a little impact on network members' innovation and performance. More specifically, Nahapiet and Ghoshal (1998: 245) advocate that a densely-tied network reduces the members' "[...] openness to information and to alternative ways of doing things, producing forms of collective blindness." In this line of thought, we argue that moderate levels of network density help embedded foreign investors to collect and distribute reliable but also innovative and relevant information about potential local partners within or outside the network. Therefore, we hypothesize:

Hypothesis 2b. The relationship between the density of the alliance network in which a foreign investor is embedded at the time of IJV formation and the failure likelihood of future IJVs by the foreign investor in emerging economies will be positive.

A network member's role and status is determined by its network position (Brass & Burkhardt, 1992; Burt, 1992; Freeman, 1979; Gulati, 1999; Polidoro et al., 2011). Network positioning is closely linked to network centrality because it refers to how critical a member is to the network's structure. Centrality may be gauged from two common measures: degree centrality and betweenness centrality (Freeman, 1979). Degree centrality is the simplest form of centrality. It corresponds to a member's involvement in a network measured as the number of ties linking the member to the other network members (Freeman, 1979). In an alliance network, a firm with a high degree centrality benefits from a large base of common experience with different embedded partners. The central firm is tied to many network members, which are tied to several other members. A high degree centrality provides the firm with fine-grained information about potential partners and therefore widens the firm's range of possible alliances within and outside the network. On the other hand, betweenness centrality refers to the presence of a firm on the shortest paths linking together all network members (i.e., geodesics). A firm with high betweenness centrality is in a broker position because it can access and control many of the network's information flows. Generally, network members are highly dependent on such broker firms and consequently betweenness centrality measures the power a network member.

Both centrality measures contribute to reducing transactional uncertainty, thereby increasing a new IJV's chances of success. High degree and betweenness centrality enables a firm to have a clear understanding of the overall structure of the network and its members. More specifically, centrality brings three advantages. First, a key advantage for central alliance network members is the amount of reliable and easy-to-access information and opportunity set of potential collaboration partners. Another advantage is that other network members view central network members as preferred collaboration partners because they consider them as trusted informants. These trusted informants are network members who centralize and circulate information internally and enjoy a high level of trust by the other network members because of their solid reputation and/or wide ranging interorganizational ties both within and outside the network (Gulati, 1999). Third, central network members enjoy high visibility which makes them more attractive to potential partners within and outside the network. Less central network members and outside firms see collaborations with central players as an opportunity to increase their own reputation, visibility, and centrality. When peripheral network members or outside firms are involved in IJVs with central firms, they aim to ensure, above all, the survival and success of such alliances. Therefore, we hypothesize:

Hypothesis 3. The failure likelihood of future IJVs by the foreign investor in emerging economies decreases with the degree centrality (H3a) and betweenness centrality (H3b) of the foreign investor embedded in an alliance network at the time of IJV formation.

3. Methods

3.1. Sample

To construct our sample, we selected large European firms[3] that had formed IJVs in emerging economies during the time period 1995–1997. 132 firms from 12 European Union countries met these criteria. We restricted our sampling procedure to the period 1995–1997 because it corresponds to a drastic acceleration in European foreign direct investment in emerging

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[3] We focused on firms that had appeared in the *Financial Times FT500* ranking at least once during the period 1995–1997.

Table 1a
Breakdown of IJVs by emerging economy.

Emerging economy	IJVs	%
China	128	36.7
India	41	11.7
Thailand	17	4.9
Brazil	13	3.7
Russia	13	3.7
Other countries	137	39.3
Total	349	100.0

Table 1b
Breakdown of IJVs by industry.

2-digit SIC code	IJVs	%
Chemicals and allied products	99	28.4
Transportation equipment	49	14.0
Electronic equipment and components	30	8.6
Oil and gas exploration	18	5.2
Food and kindred products	17	4.9
Other industries	136	39.0
Total	349	100.0

economies (Foreign Direct Investment Statistics, OECD Data, Analysis and Forecasts, 2011). We then identified 349 IJVs (henceforth: focal IJVs) formed by the 132 European firms from *Factiva, SDC Platinum, Thomson One Banker*, and annual reports. The focal IJVs are equity strategic alliances that entail the formation of an independent legal entity in which two or more European and local partners share assets and profits (Kogut, 1988, 1989). Tables 1a and 1b present the breakdown of the focal IJVs by emerging economy and industry.

To model the alliance network the sample firms are embedded in we proceeded in two steps. The modeling of alliance portfolios, i.e. ego-networks, requires making choices concerning what is included and what is not (Wassmer, 2010). In our alliance ego-network modeling approach we build on the prior literature that has taken an IJV perspective (Reuer, Park, & Zollo, 2002; Reuer & Ragozzino, 2006). First, we modeled the alliance ego-networks of the 132 sample firms in any of the three focal IJV formation years (i.e., 1995–1997) by identifying all of the sample firms' active IJVs in any given year (Bae & Gargiulo, 2004; Vanhaverbeke, Gilsing, Beerkens, & Duysters, 2009). New IJV formations in year *t* were included in the IJV ego network of year *t + 1*. Moreover, we built on prior IJV research, which assumes a seven-year IJV lifespan (Kogut, 1989, 1991; Meschi & Riccio, 2008; Park & Russo, 1996; Shi, 1998), and also included IJVs in a sample firm's IJV ego network that were formed during the seven-year period prior to the focal IJV's formation year (e.g., IJVs formed during the period 1988–1994 when the focal IJV formation year was 1995; 1989–1995 when the focal IJV formation year was 1996, etc.). For the 132 sample firms, we gathered 1431 IJV records for the study period (i.e., an average number of 11 IJVs per sample firm) involving 385 unique partner firms.

Next, since we are interested in the ties between firms from the same region of origin, we modeled the aggregate network of ties between the 132 sample firms. Here, we considered the following two types of ties. First, we modeled the direct ties between a sample firm and another sample firm, i.e., IJVs between the two firms. Second, we also modeled indirect ties between two or more sample firms through a shared local partner, i.e., scenarios when two or more sample firms were tied to the same partner through independent IJVs. The connections between the sample firms were computed as binary adjacency matrices. Lastly, we constructed time-varying adjacency matrices (Bae & Gargiulo, 2004) and obtained three sets of adjacency matrices, one corresponding to each year of the time period 1995–1997.

3.2. Dependent variable and event history procedure

Our dependent variable is the *Likelihood of IJV Failure*, defined as the likelihood that a sample firm's stake in a focal IJV is either dissolved (through closure or liquidation) or sold off abruptly. We utilized a three-step event history procedure[4] (Allison, 1984) to operationalize this variable. In the first step, we performed a longitudinal record of the change of each focal firm's IJV stake during a period at risk ranging from the IJV formation date to early 2011. We used various databases such as *Factiva, SDC Platinum*, and *Thomson One Banker* to track the change of each focal European firm's IJV stake over this period at risk. We also collected additional data by phone and e-mail inquiries concerning each focal European firm's change in the IJV

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[4] Event history analysis is used to examine the impact of covariates (independent and control variables) on the occurrence (or non-occurrence) of a focal event over a specific time period (called "period at risk").

stake. 27 foreign investors dissolved their IJVs and 79 sold off their stake to the local partner or to a third party before the end of the period at risk. In the second step, we created a dummy variable (0 for the focal European firms whose stake did not change as well as those which bought out the IJV and 1 for those whose stake changed because they had dissolved or sold off the IJV).

In support of the existing argument that IJV exits (dissolutions and sell-offs) indicate IJV failure, we collected additional information in the annual reports of the 132 sample firms. Whenever this information was available, we checked whether the country expansion associated with each (terminated or surviving) IJV was described as success or failure (Nadolska & Barkema, 2007). We then used a Cox regression to model the relationship between this success-failure categorization and our dependent dummy-coded variable. The coefficient estimate for the success-failure categorization (= +2.27) is significant (at $p > 0.001$) and indicates that IJV exits (dissolutions and sell-offs) have a likelihood of failure which is more than 8 times higher than that of surviving IJVs and IJV internationalizations.

In the last step of the event history procedure, we computed the annual duration of each focal firm's IJV stake. After computing this duration, we expanded the sample of 349 focal IJVs to include all annual observations. This expansion yielded a panel dataset of 3564 focal IJV-year observations. In the third step, we estimated the hazard rate of the focal European firm's IJV stake at time t within the period at risk as follows:

$$h(t)\lim_{\Delta t \to 0} \frac{P(t, t + \Delta t)}{\Delta t} \text{ where } 0 < h(t) < 1,$$

where $P(t, t + \Delta t)$ is the probability that a sample firm would dissolve the IJV or sell off its stake to the local partner following a failure within a time period ranging from t (the beginning of the period at risk) to $t + \Delta t$. We used a Cox proportional hazards model to examine the impact of covariates on the hazard rate. This model in which time is measured in years is defined as follows:

$$H(t) = h(t) \exp(\beta X_t),$$

where $h(t)$ is an unspecified baseline rate, X_t is the vector of covariates (independent and control variables) at the time t within the period at risk and β is the associated vector of regression coefficients. Because we had repeated IJVs per sample firm, we specified the Cox proportional hazards model with robust standard errors that correct for clustering of sample firm effects.

3.3. Independent and control variables

We performed two series of Cox regressions: one for the entire sample of IJVs and one for the sub-sample of IJVs with embedded firms. In the first Cox regression series, we introduced the independent variable *Network Embeddedness* of the focal European firms. This variable is a dummy variable measuring whether a focal European firm and its local partner are embedded in the same alliance network (coded 1) or not (coded 0). Focal firms and local partners which are embedded in the same network may be linked together either through direct or indirect ties. On the basis of this variable, we then constructed a sub-sample (comprised of 184 IJVs with embedded European firms and 2003 focal IJV-year observations) restricted to IJVs with embedded firms only. In the second series of Cox regressions conducted for the sub-sample of IJVs with embedded firms, we included the following three independent variables. (1) *Network Density* of the alliance network, which we operationalized by dividing the number of existing ties in the network by the maximum number of possible ties between network members. (2) *Degree Centrality* of the embedded focal European firms, for which we calculated degree centrality scores using *Ucinet* and the adjacency matrix corresponding to each alliance network. The degree centrality score corresponds to a focal firm's number of ties within the network. We normalized this score which ranges from 0 (very few ties) to 1 (a large number of ties). (3) *Betweenness Centrality* for which we calculated betweenness centrality scores using *Ucinet* and the adjacency matrix corresponding to each alliance network. The betweenness centrality score measures the probability of a focal firm being present on the geodesic (i.e., the shortest path between two network members) of the different members of an alliance network. We also normalized this score with ranges from 0 (low probability) to 1 (high probability).

We also included various control variables that prior IJV research has identified as determinants of IJV termination and failure (Delios & Beamish, 2004; Hennart et al., 1998; Leung, 1997; Nakamura, 2005; Polidoro et al., 2011; Valdés-Llaneza & García-Canal, 2006; Yamin & Golesorkhi, 2010). These variables include the *IJV Contract Amount* (measured in $US million and logarithmically transformed), the *Number of Partners* in the IJV, the focal European firm's *IJV Stake* (measured in %), and *Country Experience* (measured as the logarithmically transformed cumulative number of IJVs formed by a focal firm in the host country over a 10-year window prior to the IJV formation date), the *Cultural Distance* between European and local partners using the index developed by Kogut and Singh (1988) on the basis of the Hofstede's four cultural dimensions, and the annual *GDP Growth* of the host country (measured as a time-varying covariate with a one-year lag).

Moreover, we included two sets of dummy variables to control for unobserved effects related to host countries (*Country Dummies*) and industries (*Industry Dummies*). For *Country Dummies*, we dummy-coded the most prevalent countries of IJV

Table 2
Descriptive statistics and correlation matrix.

Variables	Mean	Std dev.	1	2	3	4	5	6	7	8	9
1. Network embeddedness	0.533	0.499									
2. Network density	0.121	0.272	–								
3. Degree centrality	0.168	0.276	–	0.975***							
4. Betweenness centrality	0.127	0.159	–	−0.033	0.173*						
5. IJV contract amount	161.133	488.964	0.199***	−0.105	−0.101	−0.013					
6. Number of partners	2.283	0.613	0.171***	0.109	−0.095	0.054	0.260***				
7. IJV stake	0.512	0.140	−0.066	0.150*	0.123†	−0.136†	−0.194***	−0.471***			
8. Country experience	1.510	3.453	0.271***	0.073	0.121†	0.126†	0.014	0.103†	0.109*		
9. Cultural distance	2.437	1.095	0.052	−0.092	−0.090	0.063	0.060	0.070	0.033	0.098†	
10. GDP growth	5.202	5.154	−0.045	−0.065	−0.069	0.039	−0.079	−0.002	−0.086	−0.293***	−0.218***

$n = 3564$ IJV-year observations (total sample) and 2003 IJV-year observations (sub-sample of IJVs with embedded firms).
† $p < 0.1$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$ (two-tailed tests).

investment, namely China and India (see Table 1a). For *Industry Dummies*, we dummy-coded the most prevalent IJV 2-digit SIC codes, namely chemicals and allied products, transportation equipment, and electronic equipment and components (see Table 1b).

4. Results

Table 2 presents the descriptive statistics and the correlation matrix. The highest correlation is observed for *Network Density* and *Degree Centrality*. Colinearity between variables is not an issue. Variance inflation factor (VIF) tests were well within the limit of 3, indicating that collinearity did not bias the coefficient estimates.

Table 3 reports the results of Cox proportional hazard models with *Likelihood of IJV Failure* as the dependent variable. Model 1 serves as the baseline model and consists of the control variables only. Model 2 tests the impact of *Network Embeddedness* of the focal European firms on the *Likelihood of IJV Failure*. Model 3 examines the linear effect of *Network Density* on the *Likelihood of IJV Failure*. Model 5 tests the impact of the embedded firm's position in the network on the *Likelihood of IJV Failure*. All models in Table 3 display very good statistical fit (at $p < 0.001$).

Table 3 shows that *Network Embeddedness* of the focal European firms has no significant impact on the likelihood of IJV failure. Hypothesis 1 is thus not supported. Concerning the impact of network density on the likelihood of IJV failure, we developed competing hypotheses: Hypothesis 2a builds on the *network closure* stream of research and predicts a negative impact while Hypothesis 2b, builds on the *structural holes* stream and predicts a positive impact.

Table 3
Cox regression results.[a]

Variables	Model 1	Model 2	Model 3	Model 4
Network embeddedness		0.070 (0.264)		
Network density			−1.496 (0.274)**	
Degree centrality				−1.301 (0.416)**
Betweenness centrality				0.189 (1.045)
IJV contract amount[b]	0.164 (0.139)	0.151 (0.132)	0.189 (0.127)	0.196 (0.132)
Number of partners	−0.206 (0.216)	−0.215 (0.215)	−0.258 (0.214)	−0.261 (0.215)
IJV stake	−1.267 (0.799)†	−1.268 (0.797)†	−1.680 (0.937)†	−1.688 (0.945)†
Country experience[b]	−0.472 (0.337)†	−0.507 (0.384)	−0.713 (0.568)	−0.667 (0.603)
Cultural distance	0.033 (0.095)	0.031 (0.095)	0.055 (0.125)	0.051 (0.125)
GDP growth[c]	−0.010 (0.033)	−0.010 (0.033)	−0.012 (0.043)	−0.012 (0.043)
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Log pseudo-likelihood	−571.251	−571.201	−261.764	−261.972
Wald chi-square	35.56***	36.71***	34.65***	38.24***
n (IJV exits/failures)	349 (106)	349 (106)	184 (55)	184 (55)
IJV-year observations	3564	3564	2003	2003

[a] Numbers in parentheses are robust standard errors that correct for the clustering of sample firm effects. Positive (negative) coefficient estimates indicate greater (lower) likelihood of IJV failure.
[b] Logarithmic transformation.
[c] Time-variant variable.
† $p < 0.1$.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$

Model 3 shows that the coefficient estimate for *Network Density* is negative and significant (at $p < 0.01$). This supports Hypothesis 2a and provides empirical support for the *network closure* arguments. In other words, weakly-tied and sparse networks seem to have a destabilizing effect on IJVs with the embedded firms. Conversely, if the alliance network is densely-tied, then network closure tends to decrease the risk of future IJV failure. Complementary to what we observe in model 2 (see Hypothesis 1) this finding shows that some embedded firms experience a significantly lower likelihood of IJV failure. When analyzed together, results of models 2 and 3 show that being embedded in an alliance network is not enough to significantly reduce the likelihood of IJV failure in emerging economies. The beneficial impact of network embeddedness on IJV performance is observed only for densely-tied alliance networks.

Hypotheses 3a and 3b respectively predicted that the *Likelihood of IJV Failure* was negatively related to *Degree Centrality* and *Betweenness Centrality* of embedded firms. The coefficient estimate for *Degree Centrality* of embedded European partners is negative and significant (at $p < 0.01$) while that for *Betweenness Centrality* is not significant. Thus, only Hypothesis 3a is supported.

5. Discussion

This paper contributes to the IJV outcomes and social network literatures. We extend these literatures by examining a specific alliance network that is relevant from a foreign investment perspective (i.e., IJV ego-network). Applying such a perspective goes beyond both the individual dyadic IJV and the industry-level alliance network unit of analysis. More specifically, we examined how foreign (i.e., European) investors' central network positions and specific structural IJV ego-network features can mitigate collaboration hazards with local partners in emerging economies. In doing so, we followed the recent developments by network researchers who recommend to adopt a "contingency approach" to alliance networks (Vanhaverbeke et al., 2009: 216). Consistent with this approach, we found that the efficiency of alliance networks is dependent on the type of strategy of entry into emerging economies that is implemented by embedded firms.

In addition to these contributions, this study also has implications on the IJV outcomes and social network literatures which we discuss in the next section. We close by highlight the limitations and future research avenues.

5.1. Implications on the IJV outcomes and network literatures

Research has shown that the high rate of early IJV terminations and failures in turbulent environments such as emerging economies is caused by the combination of inherent high transactional, political and economic uncertainty (Burgers & Padgett, 2009; Fang & Zhou, 2010; Yan, 1998). Our paper examined factors that can facilitate positive IJV outcomes by reducing partner-related behavioral uncertainty and decreasing the likelihood of IJV failure. Building on the network literature, our paper set out to explain how network embeddedness of foreign partners can mitigate behavioral uncertainty and IJV failure risks. The main idea we put forward is that IJV longevity and success is a consequence of the embeddedness of the foreign partners in interorganizational networks and the density of these networks as well as the foreign investor's network position.

Being part of an alliance network is a necessary but not sufficient condition to enable positive outcomes of IJV-based entries into emerging economies. Our findings show that certain alliance network structures create more positive outcomes than others. Only densely-tied alliance networks seem to offer their members the internal local partner market and base of reliable and relevant information on these partners that provide a basis for long-lasting and successful future IJVs. Thus, alliance network embeddedness as a factor to reduce behavioral uncertainty of potential partners operates at full scale in dense alliance networks: foreign investors embedded in densely-tied alliance networks are less likely to terminate their IJVs in emerging economies than those embedded in sparse networks. As a consequence, our results provide some support to the *network closure* perspective (Ahuja, 2000; Coleman, 1988, 1990; Reagans & Zuckerman, 2001; Uzzi, 1996) which stresses the informational and reputational benefits of dense networks. In the specific context of our paper, it seems that the benefits of the shared and cohesive norms and values resulting from a high network density (i.e., mutual trust, cohesiveness, within-group pressures to fulfill contractual obligations, and speed of information flows) outweigh the pitfalls associated with a closed network (i.e., redundant and non-innovative ideas, information). Another important finding concerns the foreign investor's position in the network and its impact on the likelihood of IJV failure. We did observe statistically significant differences in the likelihood of IJV failure between embedded partners occupying either a central or a peripheral position in the alliance network. In fact, occupying a central position in an alliance network translates into lower rate of IJV failure and more generally into a cooperative advantage for such embedded foreign firms. However, this observation is only valid for when degree centrality is used as the positional measure. On the contrary, betweenness centrality has no significant impact on the likelihood of IJV failure. We can note here that the direct and comprehensive access to network members resulting from a high centrality degree is more beneficial to IJV success than the strong informational control and power associated with high betweenness centrality. This finding highlights the importance of network informational benefits relative to the network control and power benefits for embedded foreign firms aiming at IJV-based entry into emerging economies. Two factors may explain this finding. First, the broker status and powerful position within the network which result from high betweenness centrality are essential to control, transmit, and eventually filter information but not to access a large base of information and knowledge on partnering opportunities in emerging economies and potential local partners' behavioral track records. Alternatively, a large number of direct ties in

the network, which is linked to high degree centrality, seems to be a more efficient way to reduce transactional uncertainty with local partners and increase IJV's chances of success. Second, this finding may be interpreted as the importance of privileging direct ties to guarantee information quality and minimize unreliable information that may be spread out by broker firms within the network (Brass & Burkhardt, 1992).

The issue of network ties is central for understanding and explaining the network-failure relationship regarding IJVs in emerging economies. In social network theory, ties are really at the core of the network, because they constitute the usual means for embedding the network's different members. Our findings underline this pivotal role, as opposed to other network variables such as the betweenness centrality of foreign partners. Ties inside a network facilitate closeness and exchanges of information, experience and knowledge between different members. They contribute to transforming an alliance network into a web of resources in which large flows of reliable and transparent information and knowledge circulate. As a consequence, they facilitate the formation of new ties between firms which are inside and outside the network (Gulati, 1995a, 1995b). However, our findings point out that interorganizational ties and the resulting network embeddedness of firms also have an ambivalent effect on the longevity and success of those new ties formed between firms located inside and/or outside the network. On one side, network ties may have a stabilizing effect on future IJVs: if they are repeated frequently among most of the network members and cover extensively the network, they lead to the formation of tightly-coupled, closed and small networks which in turn have a positive effect on the longevity and success of future IJVs. Such repeated ties among network members may be likened to strong ties (Burt, 1992; Granovetter, 1973, 1985, 1992). By repeating ties with a same partner, whether foreign or local, firms develop a cohesion-exclusion mechanism for their alliances. Thus, repetition of ties produces what Gulati and Gargiulo (1999) have called overembeddedness of partners who develop a unique, strong and symbiotic relationship together. In this network configuration, fewer and fewer alliances are formed with new partners. Even when IJVs are formed with local firms outside the network, their selection process has been often constrained and eventually biased by the cohesion-exclusion filters which result from repeated ties between the same two partners (Baum, Rowley, Shilipov, & Chuang, 2005). However, our results show that in the uncertain and dynamic environment of emerging economies, the densely-tied network benefits, namely trust, commitment and reciprocity among network members, outweigh the negative consequences of overembeddedness. Despite overembeddedness and the associated cohesion-exclusion dynamics, superior flow, quality and reliability of information and knowledge stemming from such dense web of strong ties help embedded foreign firms form long-lived and successful IJVs in emerging economies. In such an environment, protecting current and future IJVs from environment uncertainty in general, and from opportunistic behavior by local partners in particular, is more valued than exploring and experimenting novel entry strategies (with alternative entry modes, local partners, etc.).

On the other side, network ties may have a destabilizing effect on future IJVs: if they connect loosely (too) many members, they lead to the formation of vast, open and often inoperative networks which in turn, have a negative effect on the longevity and success of future IJVs. Such a network provides the embedded firms with not enough reciprocal obligations and too many information about potential partners and collaborative options. Embedded firms are confronted with an information overload and trapped in an under-embeddedness process, which does not help them mitigate the inter-partner tensions and conflicts as well as all the collaborative hazards occurring during the IJV lifecycle.

In a more managerial perspective, our findings suggest that forming and multiplying embedded ties are not a guarantee of success for foreign investors entering into emerging economies through IJVs with local firms. In fact, a rich, reliable and easily accessible base of information and knowledge on potential partnering opportunities and local firms' behavior will not automatically emerge from all alliance networks. Second, for a potential investor which is not embedded in any alliance network, it is worthwhile privileging the formation of ties with firms that are already densely-connected with each other. Alternatively, a potential investor which is already embedded in a network has to "induce bilateral commitments from its partners" (Bae & Gargiulo, 2004: 857) to foster the emergence of a densely-tied alliance network.

5.2. Limitations and future research

This study is conditioned by a number of limitations. Our ego-network, i.e. alliance portfolio, modeling approach, only takes the sample firms' IJVs into account. This may limit the generalizability of our findings in that some firms may also have non-equity collaborations in their portfolio through which they may obtain access to valuable information. Second, the alliance network under study here is only identified and analyzed at the time of the focal IJV formations. This cross-sectional approach to examining the effect of foreign partners' network embeddedness on the likelihood of IJV failure in emerging economies does not take into account the modifications of the network composition and boundaries over time. During the lifecycle of the focal IJVs, alliance networks may evolve following either the creation of new ties with outside firms and/or the severance of ties with exiting network members. Thus, future research could adopt a more dynamic longitudinal approach to alliance networks and examine the impact of such time-varying webs of ties on IJV failure. This would offer a more complete and robust view of the cooperative advantage of alliance networks for embedded firms considering IJV-based entry into emerging economies. The interpretation of the empirical results of this study is also conditioned by another limitation, which can be also addressed in future research. The results of this study may be influenced by the particular characteristics of the chosen empirical setting, i.e. the specific emerging economies and the industries of the focal European firms. Thus, the results presented in this study may not apply to other geographical contexts and industries. Future research may therefore address this concern by focusing on different geographical settings.

6. Conclusion

We started this study by noting that there is scarce empirical evidence on how alliance networks affect the failure likelihood of IJVs. Especially, little seems to be known about network-specific factors such as network density, degree centrality, and betweenness centrality. Therefore, this study set out to address these gaps in the literature by providing new theory and empirical evidence to better understand the role that foreign investors' alliance networks play in the outcomes of IJVs formed with local firms in emerging economies. Our empirical analysis suggested that two network-specific features are crucial to reduce IJV failure rates: (1) a foreign investor's embeddedness in densely-tied alliance networks and (2) a foreign investor's central position in the alliance network.

We submit that the contribution of this study rests in two main areas. First, we have drawn on an important stream of literature central to social network research and developed an alliance network perspective of IJV failure. Second, this study also addresses the broader question: do alliance networks matter in explaining outcomes of IJVs? The answer is yes they do matter, because they provide foreign firms not only with opportunities for obtaining valuable and abundant information about potential partners prior to the IJV's formation phase but also suggest that different network structures provide different informational and reputational benefits. To sum up, our theoretical and empirical analysis contributes to two important streams of international business and strategy research, namely the role of alliance networks in IJV-based market entry decisions (Polidoro et al., 2011) as well as outcomes of IJV (Hennart et al., 1998; Leung, 1997; Nakamura, 2005; Valdés-Llaneza & García-Canal, 2006; Yamin & Golesorkhi, 2010). We are confident that this study provides a useful perspective and further the understanding of some of the issues that foreign firms face upon IJV-based entry into emerging economies.

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