Innovation alliances: Balancing value creation dynamics, competitive intensity and market overlap

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Abstract

When created and captured value is unbalanced in innovation alliances, instabilities may emerge. Competitive tensions between the partners may further destabilize the value creation process. How these dynamics affect the outcomes of innovation alliances is still far from clear. This study focuses on expert power, relative private and common benefits, and perceived competitive intensity as well as structural market overlap between partners. While direct effects of expert power or the (im-) balances in intra-alliance innovation-related value dynamics do not emerge, we find that these effects are strongly moderated by the level of competition. When perceived competitive intensity is high, the partner's expert power turns out to be less beneficial, and imbalance towards private benefits becomes detrimental for value creation. On the other hand, when the market overlap between the partners is high, the expert power of partners, as well as common benefits become more beneficial to innovation-related value creation.

Keywords: Value creation dynamics; Innovation alliances; Expert power; Coopetition

1 Introduction

Grounded in the resource-based view and knowledge-based view theories, innovation alliances involve partners who use complementarities of resources for new technologies, products and services (e.g. Barney, 1991; Grant, 1996; Harrison, Hitt, Hoskisson, & Ireland, 2001; Kale, Singh, & Perlmutter, 2000; Nonaka, 1994). Such relationships are far from harmonious – rather, they are full of instability, bargaining, and imbalances in private and common benefits (Bouncken & Fredrich, 2012). Accordingly, there is increasing interest on how value is created and captured within innovation alliances (Ritala & Hurmelinna-Laukkanen, 2009, 2013; Ozmel, Yavuz, Reuer, & Zenger, 2017). Some alliance partners are able to squeeze more benefits than others due to power differences from expertise (Bouncken & Fredrich, 2016; Maloni & Benton, 2000) or differences in intra-alliance value capture strategies (Lavie, 2009). Uneven balance might lead to alliance failure and lowered performance (Inkpen & Beamish, 1997; Fredrich, Bouncken, & Kraus, 2019). Alliance relationships also involve tensions from the competitive positioning of partners (Das & Teng, 2000). Competitive tensions come in different forms, and can include perceived competitive intensity but also merely structural market overlap (Chen, Kuo-Hsien, & Tsai, 2007). Market overlap, as such, can have advantages as it potentially helps knowledge diffusion through the improved relative absorptive capacity between partners from a similar background (Fredrich et al., 2019; Lane & Lubatkin, 1998).

While we know that imbalances in private and common benefits as well as competitive tensions can be detrimental for alliance relationships, we still do not fully understand the intra-alliance dynamics (Bouncken, Clauß, & Fredrich, 2016; Dyer, Singh, & Hesterly, 2018). Our article contributes to this gap by examining how alliance partners' expertise, the distribution of private and common benefits, and competitive positioning of the alliance partners affect the overall value created in the innovation alliance. Value creation in innovation alliances benefits from expert power partners, but suffers from imbalanced distribution of private benefits. Furthermore, we argue that competitive intensity between alliance partners negatively moderates the positive effects of partner expertise and common benefits, while structural market overlap has a positively moderating role.

We find mixed support for our hypotheses in a sample of N=347 dyadic innovation alliances. Expert power partners and distribution of private and common benefits are not directly significant. However, under high levels of perceived competitive intensity, partners' expert power turns out to be negative for innovation-related value creation, while the opposite occurs under high levels of market overlap. Similarly, competitive intensity and market overlap have opposite consequences for innovation-related private and common benefits.

Overall, we provide novel findings on the intra-alliance dynamics of partner expertise, and the distribution of private and common benefits, helping to better understand the "value capture rights" (Ozmel et al., 2017) or "value capture strategies" (Lavie, 2009). Furthermore, we support Chen et al. (2007) in that perceived competitive intensity and structural market overlap can have different consequences.

2 Theoretical background

The resource-based view and the knowledge-based view sparked research on resource complementarities in alliance research (e.g. Barney, 1991; Grant, 1996; Harrison et al., 2001; Kale et al., 2000; Nonaka, 1994). Resource complementarities create value for allying parties. *Value* is defined as the *willingness to pay* by the end customers (Garcia-Castro & Aguilera, 2015). Firms engage in alliances when the partners expect to create more value than what they could achieve alone (Das & Teng, 2000). Lavie (2009) defines *value-creation strategies* as those that generate benefits that are shared by the partners, and *value-capture strategies* as those that determine how these collective benefits are split. Both are interdependent processes, but also involve dynamics. Firms not only care about the absolute value capture, but also total value creation and their relative inputs and relative value capture (Fernandez, Le Roy, & Gnyawali, 2014; Lavie, Haunschild, & Khanna, 2012). The result is a constant oscillation between bargaining and control, where the partners continuously evaluate, adapt, and negotiate inputs to value creation and gains from value capture (Khanna, Gulati, & Nohria, 1998; Lavie, 2009; Zeng & Chen, 2003).

In innovation alliances, these dynamics are even more critical because of uncertainty over the outcomes (Bouncken, Fredrich, & Kraus, 2019) that rely on the integration of complementary resources, most importantly knowledge (Dhanaraj & Parkhe, 2006; Grant & Baden-Fuller, 2004). Partners with a strong knowledge base and expertise ("expert power", Maloni & Benton, 2000) – also possess high bargaining power (Clauss & Bouncken, 2019). Thus, firms with high access to relevant knowledge have a strong ability to affect value creation and capture (Ozmel et al., 2017).

Industry position and related *competitive dynamics* play an important role in the value dynamics of innovation alliances. Relatedly, "coopetition" research shows that collaboration with competitors can provide positive and negative implications for firms' innovation (Bouncken, Fredrich, Ritala, & Kraus, 2018; Park, Srivastava, & Gnyawali, 2014; Ritala, Kraus, & Bouncken, 2016). Coopetitors may integrate, share and learn knowledge more effectively (Ritala & Hurmelinna-Laukkanen, 2009). However, the firms' competitive position is a source of tensions. The implicit rivalry might lead to over-protectiveness and more selective sharing of knowledge, as well as instability, tension, and suboptimal innovation outcomes compared to non-rivals (Bouncken et al., 2019; Das & Teng, 2000; Nieto & Santamaría, 2007; Raza-Ullah, Bengtsson, & Kock, 2014).

3 Conceptual framework and hypotheses

Our model (see Fig. 1) aims to explain intra-alliance dynamics related to knowledge-based bargaining positions as well as "net value capture" between partners (Ozmel et al., 2017). Furthermore, we examine the role of competitive overlap for innovation (Nieto & Santamaría, 2007; Kraus, Meier, Niemand, Bouncken, & Ritala, 2018). Previous literature has provided inconsistent results over the role of competition and its innovation-related mechanisms in alliances (Bouncken, Gast, Kraus, & Bogers, 2015). The inconsistency might be attributable to how *competitive tension* differs between different pairs of firms. Some firms perceive their competitors as a more direct threat than others (Gnyawali, He, & Madhavan, 2006). Perceived tension is important, since it is the managerial perception of competition (Chen et al., 2007). *Market overlap* is a structural feature related to the industry, and reflects the alliance partners' competitive positioning (i.e. to which extent collaborating

firms operate in the same markets). Market overlap and perceived tensions need not necessarily go hand in hand. Market overlap is a structural feature in the firms' relative positioning, while perceived tension is the mechanism that drives actual competitive behavior.

Fig. 1

French Jr. and Raven (1959) describe *expert power* as the power source's access to knowledge and skills desired by the power target. Expert power partners have market reputation or technological expertise related to the problem and may provide further informational advantages (Stern, Dukerich, & Zajac, 2014). Innovation-related value creation improves through the access to partners' expertise and abilities, and indirectly via legitimation and reputation associated with powerful partners (Maloni & Benton, 2000). Expert power partners can increase isolating mechanisms against other firms outside the relationship (Lavie et al., 2012). Isolating mechanisms (accompanied by rare, inimitable, non-substitutable, and valuable resources, see in the RBV) establish imitation barriers and drive value creation and capture. Thus, collaboration with an expert power partner will increase the innovation-related value created in alliances.

> ***Hypothesis 1:*** *Expert power of a focal firm's alliance partner is positively associated with innovation-related value creation in the alliance.*

However, when the stakes in the alliance grow higher in terms of competitive tensions, see for example the alliance between Samsung and Sony (Gnyawali & Park, 2011), we expect that partner expertise is less beneficial, given the rising instabilities in the alliance. Strong bargaining power (e.g., with respect to interdependence or accessibility of alternatives) allows to (re-)negotiate the terms of alliance contracts, to skew clauses to their benefit, and to directly influence the outcomes (Lavie, 2007; Ozmel et al., 2017). The incompleteness of contracts and the dynamics that follow alliance formation allow for further bargaining (Reuer, Zollo, & Singh, 2002). In case of competitive tension, the higher power of the partner creates a risk of lowering total value creation because the power holder might limit their inputs to value creation. Lavie (2007: 1187) points out: "the relative bargaining power of partners in the alliance portfolio constrains the firm's appropriation capacity, especially

when many of these partners compete in the focal firm's industry." Indeed, the expert partner might be perceived as a threat in situations with high competitive intensity, and accordingly, the focal firm might scope down its knowledge sharing and value creating efforts.

Hypothesis 2a: *Perceived competition intensity negatively moderates the relationship between alliance partner's expert power and innovation-related value creation in the alliance.*

While the prospect of collaborating with a strong partner under high competitive tension may be harmful, such tensions are perceptional and not necessarily related to the structure of the industry (Chen et al., 2007). A partner with a similar industry profile does not necessarily bring negative tensions. Horizontal market overlap provides understanding of shared technologies, institutional issues, and customer preferences (Gnyawali & Park, 2011). This improves innovation-related value creation. First, an expert power partner allows to shift the typical scale advantages towards scope advantages (Dussauge, Garrette, & Mitchell, 2000), increasing the prospects of inter-firm learning and knowledge creation. Second, the benefit of an expert power partner's legitimacy increases in situations with high market overlap. The partner's expertise can help build legitimacy in the field in which innovation will be introduced (Ansari, Garud, & Kumaraswamy, 2016).

Hypothesis 2b: *Market overlap between the focal firm and the alliance partner positively moderates the relationship between alliance partner's expert power and innovation-related value creation in the alliance.*

Alliance partners can face imbalances between how much input and output is allocated to different partners and relatedly how much private and common benefits are pursued (Zeng & Chen, 2003). We regard *private benefits* as a directional asymmetric situation where either of the partner firms captures a relatively larger share of the value than it should capture based on its inputs to the value creation. Alliance partners will notice disproportionate capturing of value. *Common benefits* refer to the relative "fairness" or equality in the distribution of inputs to the value creation and the abilities to capture the created value. Ideally, an alliance involves a fair distribution of benefits where different

actors capture value based on their inputs, or, in other words, 'get what they deserve' (Khanna et al., 1998; Luo, 2008).

Firms can vary in their relative inputs for creating and capturing innovation-related value (Brandenburger & Nalebuff, 1996; Dyer, Singh, & Kale, 2008). When one partner's individual value creation inputs are substantially higher (or lower) than the perceived outputs, firms perceive an imbalance towards private benefits; thereby lowering the total innovation-related value creation. As the imbalance intensifies, the alliance might move into a downward spiral, especially reducing the relatively underperforming partner's motivation to contribute to value creation. Such imbalances are an important source of negative dynamics, which can lower the overall alliance performance (Inkpen & Beamish, 1997; Das & Teng, 2000; Zeng & Chen, 2003).

Hypothesis 3a: *An increase in private benefits leads to lower innovation-related value creation.*

Yet, when firms perceive a balancing act where the value created and captured follows the logic of common benefits, they are more likely to engage in knowledge sharing and other types of value creating exchanges, leading to improved innovation outcomes.

Hypothesis 3b: *An increase in common benefits leads to higher innovation-related value creation in the alliance.*

The potential for a downward spiral increases under highly perceived competitive intensity. The uneven capture of value suggests an unfair outcome of the value creation process, but also as a rival bargaining context. Such dynamics might lead to firm-level sub-optimization: advantages might fade away due to learning races (Hamel, 1991), dysfunctional governance (Smets, Langerak, & Tatikonda, 2016), and lowering the priority and scope of a specific alliance (Oxley & Sampson, 2004). Rivalry might create further conflicts over value distribution, alliance goals, and alliance vision which lead to withholding of innovation related-knowledge (Bouncken & Kraus, 2013). Furthermore, we expect that perceived competition intensity will also restrict the value creation when alliance partners perceive a fair distribution of value (i.e. common benefits). The more intense the perceived competition, the more reserved the partners will be in contributing valuable knowledge and

capabilities in the alliance (Khanna et al., 1998). Even if partners capture an equal amount of value from the alliance, competitive issues create tensions that reach beyond the alliance context, and might have long-term consequences.

Hypothesis 4a, 4b: *Perceived competition intensity negatively moderates the relationship between (a) private benefits and (b) common benefits and innovation-related value creation in the alliance.*

While competitive intensity complicates value creation in innovation alliances, market overlap can provide advantages (Bouncken et al., 2019). First, the potentially negative effect of private benefits is likely to have less negative consequences in cases of high market overlap. There is more value to be shared or divided, leaving even an actor who is worse off with higher overall value (i.e. the "cake" is larger, see e.g., Ritala & Hurmelinna-Laukkanen, 2009). Second, the similar positive contingency applies to alliances where common benefits exit. Then, the market overlap improves the relative absorptive capacity and knowledge flow between alliance partners, enabling them to create more value in a way that is distributed equally.

Hypothesis 5a, 5b: *Market overlap between the focal firm and the alliance partner positively moderates the relationship between (a) private benefits and (b) common benefits and innovation-related value creation in the alliance.*

4 Methods

4.1 Sample

This study's population consists of one of five international trade fairs hosted in Germany from 2014–2016 (e.g., service providers, manufacturers of electronics and medical devices with SIC codes 3679, 3841, 7371). Following a key-informant approach, we personally invited firm representatives from top and middle management to fill out a paper-and-pencil questionnaire on *one specific alliance* that they were most knowledgeable. We gathered a total of N=2,060 t_0-questionnaires at a 29% raw

response rate. We recollected data at the same trade fairs a year later during 2015–2017. After researching missing secondary data and excluding unknowledgeable respondents or non-innovation alliances, our final sample consists of N=347 t_1-innovation alliances with one-year-lagged dependent information and no significant deviations from the overall population's firm characteristics (with P>.10 for countries of origin, firm sizes, and firm ages).

Despite a representative sample in t_0, a subsample self-selection may occur in t_1 (e.g., survival bias). Therefore, we applied a binary t_1-selection model for countries of origin and all model-implied variables yielding a weakly significant overall selection prediction (χ^2=79.95, df=62, P=.06), mostly attributable (χ^2=24.21, df=2, P<.001) towards a home country effect of overrepresented German exhibitors (t_0: 36% vs. t_1: 43%) and underrepresented Chinese exhibitors (t_0: 16% vs. t_1: 10%) that experience greater geographical distance and intertemporal fluctuation. Apart from these expected shifts, there is no evidence for further selection biases. On average, responding firms were founded in 1982, employed a staff of 625, and achieved sales revenues of € mn. 196 with R&D intensity of 15.4%.

4.2 Measures and analyses

We adapted a scale from Lee and Colarelli O'Connor (2003) to the alliance context. Our dependent measure labeled as *alliance innovation value* (AIV) reflects the novelty of the total innovation-related value generated in terms of technology and the market. This measure shows composite reliability (CR_{t0}=.89, CR_{t1}=.87), convergent validity (average variance extracted, AVE_{t0}=.72, AVE_{t1}=.70), and strong parallels to the superiority of product innovation (Lee & Colarelli O'Connor, 2003).

We used a scale by Maloni and Benton (2000) to assess the *partners' expert power* that refers to the perception of the partner's firm holding information or expertise that is valued by the firm (CR=.79, AVE=.56). We reviewed several objective dyadic competition measures (Baum & Korn, 1999; Wu, 2014). Instead of SIC-code similarity, we focus on sales overlap to account for highly diversified firms that share the same SIC codes but not necessarily high sales percentages from the same markets. Log-standardization of sales percentages (mean=29%, median=20%) yielded an almost bell-shaped

measure of *market overlap* by *objectively-oriented competition intensity* (=C_{obj} with skewness S=|–.80|<2 and kurtosis K=|.03|<7; West, Finch, & Curran, 1995). Subjectively *perceived competition intensity* (=C_{sub}) reflects the competition intensity within the innovation alliance under study (originally labeled as *coopetition intensity*; e.g., Bouncken & Kraus, 2013). Both competition measures indicate a highly significant overlap (rho_{mlr}=.26, P<.001; non-parametric Spearman rho=.20, P<.001).

For intra-alliance value creation–capture dynamics, we asked respondents to evaluate (1) "*Whose relative input/effort for these values is stronger?*" and (2) "*Who is relatively better at capturing the value?*" relating to each item of the AIV scale. We calculated two additional variables (–1='partner', 0='equal/ly', +1='we') for '*relative capture*' (ranging from –3 to +3) and '*relative creation*' (ranging from –3 to +3) as well as a standardized difference score labeled as '*firm A's relative private benefits*' (*PB=relative capture–relative creation*; S=.29, K=2.80). Thus, deviations from zero express the magnitude of *directional asymmetry* towards (negative) firm B or (positive) responding firm A. We further calculated a count variable for '*(symmetric) common benefits*' (*CB* ranging from 0='*non-directional asymmetry*' to 6='*maximum symmetry*' if all six items are '0=equal/ly'; S=–.15, K=–1.48). We distinguished *directional* from *non-directional asymmetry* because it is less ambiguous: Highest scores on the CB scale are zeros on the PB scale, but not vice versa. Zeros on the PB scale can take on any value on the CB scale (rho_{mlr}=.04, P=.36).

We controlled for firm- and relationship-specific characteristics. *Firm size* expresses structural determinants of innovation value creation and capture (Chandy & Tellis, 2000). *Firm age* may reflect accumulated business experience and improve efficiency through learning-by-doing routines (Zollo, Reuer, & Singh, 2002). *Relationship duration* accounted for partner-specific experiences, different stages, and accumulated total value generated within the innovation alliance (Jap & Ganesan, 2000). *R&D intensity* reflects a firm's potential to create new value within alliances and its absorptive capacity (Cohen & Levinthal, 1990). We further controlled *alliance termination* before t_1 and the initial level of the *alliance innovation value* in t_0 to reduce endogeneity from sample selection bias and omitted causes of innovation.

For hypotheses testing, we used covariance-based structural equation modeling (CB-SEM) implemented in Mplus 7.4. We used scaled log-likelihood ratio tests to evaluate global model fit under maximum likelihood robust (MLR) estimation (Muthén & Muthén, 1998–2017). Table 1 reveals latent and manifest correlations after running a confirmatory factor analysis.

Table 1
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5 Results

5.1 Hypotheses results

Table 2 provides results based on MLR estimations for nested models.

Table 2

AIV_{t0} greatly predicts AIV_{t1} demonstrating the necessity to control for it. We have to reject H1 which postulates a positive influence of a partner's expert power on AIV_{t1} (model A: β=.02, P=.87). H2a assumes a negative moderation of the main effect for linearly growing levels of C_{sub} within the alliance. Model B supports this hypothesis (H2a: β=–.35, P=.01). H2b suggests an opposite positive moderation of the main effect by log-linearly growing levels of C_{obj}. We find support for H2b (model C: β=.19, P=.04). Both competition intensities show no direct effects on AIV_{t1}. Model D shows results of relative private and common benefits and their interactions with both competition intensities. Neither linear shifts on the private benefits (H3a: β=–.08, P=.19) nor the common benefits scale show significant direct effects on AIV_{t1} (H3b: β=–.00, P=.99), rejecting hypotheses 3a and 3b. Symmetric combinations of relative private benefits and C_{sub} decreased AIV_{t1} significantly, supporting H4a (β=–.20, P=.05). Consequently, AIV_{t1} favors from asymmetric combinations, e.g. strong private benefits of firm A under low C_{sub}. We have to reject H4b that assumed a negative moderation effect between C_{sub} and common benefits on AIV_{t1} (β=–.13, P=.19). We find no support for H5a that suggested a positive moderation effect between C_{obj} and private benefits on AIV_{t1} (β=–.04, P=.49). H5b postulated a positive moderation effect between C_{obj} and common benefits on AIV_{t1}. Results support H5b (β=.12, P=.03). All results remain consistent in model E after accounting for additional 3-way interactions to

avoid spurious significances (Carte & Russell, 2003). Figure 2 illustrates regions of significance for the average marginal effect (i.e. first derivatives) of partner's expert power on AIV_{t1} (y-axis) for all combinations of C_{obj} (x-axis) and C_{sub} (z-axis).

Fig. 2

The profile at the bottom of Fig. 2 shows regions of significance at 5%. Significantly negative/positive regions (–/+) emerge for upper/lower bounds of the 95% confidence interval being negative/positive. Sign changes indicate insignificant regions (n.s.). C_{obj}@0.0 and C_{sub}@0.0 marks the sample-specific insignificant average marginal effect of EXPOW on AIV_{t1}. Equation 1 shows model C estimates extended by a linear 3-way interaction of EXPOW×C_{sub}×C_{obj}:

$$\frac{d(AIV\ t1)}{d(EXPOW)} = -.01 + .21^{*} \times Cobj + -.48^{***} \times Csub + .05 \times Cobj \times Csub \quad (1)$$

Regions of significance indicate that partner's expert power diminishes AIV_{t1} under high C_{sub} and below average C_{obj}. Contrarily, collaborating with expert power partners with above average C_{obj} will improve AIV_{t1} under below average C_{sub}.

5.2 Robustness testing

Several post-hoc robustness tests support our results and increase generalizability. We reduced common method variance (CMV) by following recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003). We used multiple sources and a time-lagged dependent variable. As scalar measurement invariance is a precondition to examining latent variables, we checked the sensitivity of results by language-based standardization of all Likert-type items, yielding consistent results. We evaluated a potential single-source bias by comparing consulting (t_0: 36%, t_1: 31%) vs. non-consulting respondents (t_0: 64%, t_1: 70%) and found no meaningful differences (all P>.10, Atuahene-Gima, Slater, & Olson, 2005). In dealing with unobservable sources of CMV, we constrained all Likert-type items to equally load on an uncorrelated confirmatory common method factor, yielding insignificant global model improvement.

We also checked for potential endogeneity from omitted variables and non-random sample selection. Following recommendations by Semadeni, Withers, and Trevis Certo (2014), we applied an instrumental variables approach with (1) strongly relevant and (2) truly exogenous instruments. (3) Insignificant pairwise Durbin-Wu-Hausman tests show no statistical signs of endogeneity.

6 Discussion

Strategy and innovation research has started to unlock the dynamics of value creation and capture in alliances (Dyer et al., 2008; Lavie, 2007, 2009; Lavie et al., 2012), showing that the two are interdependent processes (Dyer et al., 2018). However, it is still unknown how dynamics of value creation and appropriation affect the outcomes of innovation alliances. Our study focused on the expert power of partners, as well as intra-alliance value creation and capture dynamics by private and common benefits. In addition, we examined the focal contingencies in innovation alliances that regulate the aforementioned dynamics: the perceptions of competitive intensity between the partners as well as the structural market overlap (Chen et al., 2007). While we did not find strong evidence of direct effects of expert power or the imbalances in intra-alliance value dynamics for innovation-related value creation, we found that effects are strongly moderated by perceived competition intensity (negatively) and by structural market overlap (positively). When perceived competitive intensity is high, the expert power of a focal firm's partner is less beneficial, and imbalance towards private benefits becomes detrimental to innovation-related value creation. Yet, under high market overlap, expert power of partners as well as common benefits improve innovation-related value creation.

First, our results demonstrate that innovation alliances are an arena of bargaining, imbalances, and instability related to value creation and capture, as suggested in existing alliance research (Khanna et al., 1998; Lavie, 2009; Zeng & Chen, 2003). Firms need a 'balancing act' between inputs to value creation and relative share of value captured. Dynamics may result in negative tensions from perceived competitive actions, or in positive tensions from shared industry background. Potential imbalances will not affect the outcomes as much as in cases with the tensions present. We contribute

to the alliance imbalance and tension literature, which pursue to understand why and when tensions arise and how it matters (Inkpen & Beamish, 1997; Das & Teng, 2000; Zeng & Chen, 2003).

Second, our results provide support for the arguments by Chen et al. (2007) that perceived competition intensity between a particular dyad of firms is an idiosyncratic phenomenon, and not often related to the actual structural market positioning/overlap. Some competitors are seen as more focal than others (Porac, Thomas, Wilson, Paton, & Kanfer, 1995).

7 Conclusion and limitations

Our research brings new insights into the balancing act in coopetition. In providing opposite results for the moderation effects of competition intensity and market overlap, our study introduces a new context (innovation alliances and their value creation–capture dynamics) that backs up these classic arguments in competitive dynamics literature.

Our study has some limitations. Looking at one side of dyadic relationships may be insufficient to fully address the complex dynamics at play. There might be internal motivations of the firms and new structures besides the tensions connected to external tensions (Bouncken et al., 2019; Bouncken, Laudien, Fredrich, & Görmar, 2018). Future research could utilize more holistic approaches to collect alliance-level data. Despite using a lagged dependent variable, future studies could be more explicit about how dynamics evolve over time. Future research might look into other empirical settings with multiple partners in alliance networks or focal firms' alliance portfolios.

Appendix

Table A1 Confirmatory factor analysis.

N=347 strategic alliances *Construct label and item wording*	Std. loading	T-value (MLR)
Global fit from MLR: χ^2=354.79, d.f.=215, P=.000, scaling correction factor for MLR=1.063, CFI=.919, TLI=.912, RMSEA=.043, SRMR=.063.		
Expert power of partner (CR=.79, AVE=.56, FL=.06).		
Source: Maloni and Benton (2000).		
1. Our partner is an expert in its industry.	.70[a]	13.7
2. Our partner retains business expertise that makes them likely to suggest the proper thing to do.	.88	17.9
3. We respect the judgment of representatives of our partner.	.63	9.8
Perceived competition intensity C_{sub} (CR=.86, AVE=.68, FL=.01).		
Source: Bouncken and Kraus (2013).		
1. Our partner is also our competitor, with whom we pursue a common goal.	.67[a]	17.3
2. We are in close competition with our partner.	.89	37.6
3. We collaborate with this competitor to achieve a common goal.	.89	31.6
Alliance innovation value AIV[b] in t_0 (CR=.89, AVE=.72, FL=.28) and t_1 (CR=.87, AVE=.70, FL=.29).		
Source: Lee & Colarelli O'Connor (2003).		
How much value does the relationship generate in the following fields? (1=no value, 5=very much)		
	t_0/t_1	t_0/t_1
A1. Innovations incorporating technology which is new to customers.	.91[a]/.90[a]	39.9/40.0
A2. Innovations offering benefits new to the customers.	.85/.84	38.6/33.4
A3. Innovations that introduce many completely new features to the market.	.79/.76	27.1/24.0
For each item we additionally ask categorically:		
+1='ours/we', 0='equal/ly', –1='partner's input/partner'		
B1/2/3. Whose relative input/effort for these values is stronger?		
C1/2/3. Who is better in capturing the value?		

[a] Initial loading fixed to 1 to set the scale of the construct.
[b] Unstandardized t_0 and t_1 factor loadings restricted as equal.

IN-TEXT:

Table 1 Bivariate latent and manifest correlations.

Measures	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Alliance innovation value AIV_{t0}	.72	.58***	.27***	–.06	.06	–.00	–.02	–.05	.02	.10†	–.04	.03
2. Alliance innovation value AIV_{t1}	.46***	.70	.13*	–.07	.05	–.05	–.12*	.05	–.04	.11*	–.08	–.03
3. Expert power of partner	.20*	.08	.56	.07	.12*	–.07	.10	–.05	.08	–.08	–.00	–.08
4. Perceived competition intensity C_{sub}	–.01	–.05	.07	.68	.20***	.03	.01	.10	.01	.05	–.00	.08
5. Log market overlap C_{obj}	.03	.02	.06	.26***	1.00	–.01	.02	–.04	.15**	.05	.01	–.03
6. Alliance termination (*binary*)	–.02	–.04	–.06	.04	–.02	1.00	.01	.00	–.04	.02	–.07	–.09
7. Log age of firm A	.00	–.09	.10†	–.00	.00	.01	1.00	.30***	.28***	–.08	.08	.02
8. Log size of firm A	–.02	.07	–.06	.08	–.01	.01	.32***	1.00	.04	.02	.03	–.05
9. Log relationship duration	–.00	–.04	.05	.04	.09†	–.02	.31***	.03	1.00	–.13*	.02	.02
10. R&D intensity of firm A	.16*	.13	–.13†	.03	.03	.04	–.11	.06	–.17**	1.00	–.03	–.01
11. Relative private benefits towards firm A	–.03	–.08	.01	–.03	.04	–.09†	.05	.02	.00	–.10	1.00	.06
12. Balanced common benefits	.04	–.02	.10†	.09	–.03	–.10†	.00	–.03	.01	–.03	.04	1.00

Notes: N=347; diagonals represent average variances extracted, below are MLR estimates of zero-order correlations, above non-parametric Spearman correlations.
†p<.10, *p<.05, **p<.01, ***p<.001.

Table 2 Hypotheses results.

Path on *alliance product innovation value AIV* in t_1 of N=347 innovation alliances	**Model A** controls + H1	**Model B** + H2a	**Model C** + H2b	**Model D** + H3, H4, H5	**Model E** + all 3ways
AIV in t_0	.44***(.074)	.46***(.072)	.45***(.071)	.46***(.071)	.47***(.073)
Alliance termination (binary)	–.03(.082)	–.01(.083)	.01(.080)	–.01(.077)	.01(.080)
Log firm A size	.11†(.057)	.09†(.057)	.11†(.056)	.08(.056)	.08(.076)
Log firm A age	–.12†(.063)	–.11†(.063)	–.11†(.064)	–.10(.066)	–.09(.093)
Log relationship duration	.00(.061)	–.01(.060)	–.02(.061)	–.01(.060)	–.03(.058)
Log R&D intensity	.04(.072)	.02(.071)	.03(.070)	.03(.069)	.01(.070)
H1: Expert power (EXPOW)	.02(.106)	.02(.105)	.02(.103)	.03(.104)	.01(.113)
Perceived competition C_{sub}		–.03(.090)	–.06(.093)	–.04(.096)	–.13(.095)
Log market overlap C_{obj}		–	.03(.053)	.01(.054)	.01(.060)
H2a: EXPOW×C_{sub}		–.35*(.140)	–.43**(.142)	–.47**(.154)	–.41*(.166)
H2b: EXPOW×C_{obj}		–	.19*(.088)	.20*(.087)	.25*(.104)
H3a: Relative private benefits towards firm A (PB)				–.08(.057)	–.07(.055)
H3b: Balanced common benefits (CB)				–.00(.055)	.00(.055)
H4a: PB×C_{sub}				–.20*(.102)	–.18†(.101)
H4b: CB×C_{sub}				–.13(.096)	–.15(.093)
H5a: PB×C_{obj}				–.04(.057)	–.06(.067)
H5b: CB×C_{obj}				.12*(.052)	.10†(.059)
EXPOW×PB					–.01(.079)
EXPOW×CB					.15(.106)
EXPOW×C_{obj}×PB					.01(.126)
EXPOW×C_{obj}×CB					.11(.088)
EXPOW×C_{sub}×PB					.10(.158)
EXPOW×C_{sub}×CB					.25(.182)
C_{sub}×C_{obj}					.07(.093)
C_{sub}×C_{obj}×PB					–.10(.085)
C_{sub}×C_{obj}×CB					–.00(.089)
EXPOW×C_{sub}×C_{obj}					.14(.130)
Sample-size adjusted BIC	13,442.16	13,441.43	13,442.67	13,448.76	13,465.19
MLR log-likelihood (free parameters)	–6,643.44(58)	–6,640.40(60)	–6,638.35(62)	–6,633.36(68)	–6,628.19(78)
Scaling correction factor	1.126	1.125	1.112	1.100	1.069
Scaled chi-square difference TRd (Δdf):		$\chi^2(2)=5.61^{\dagger}$	$\chi^2(2)=5.62^{\dagger}$	$\chi^2(6)=10.20$	$\chi^2(10)=12.07$
Improvement of MLR model fit:		P=.06	P=.06	P=.11	P=.28

Notes: *** P < .001, * P < .05, † P < .10. df = degrees of freedom, sup. = support, rej. = rejection; MLR standard errors in parentheses.

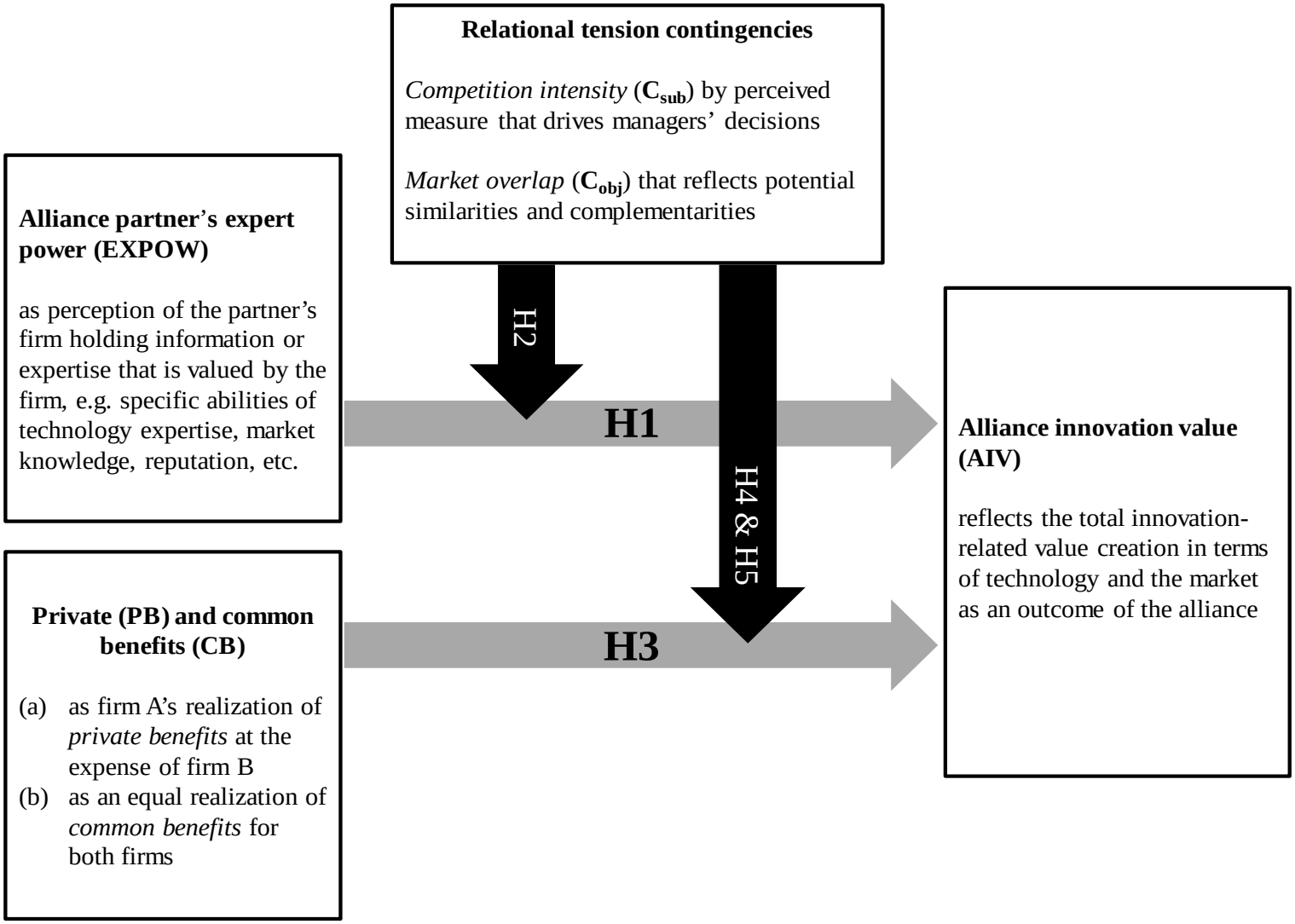

Fig. 1 Research model.

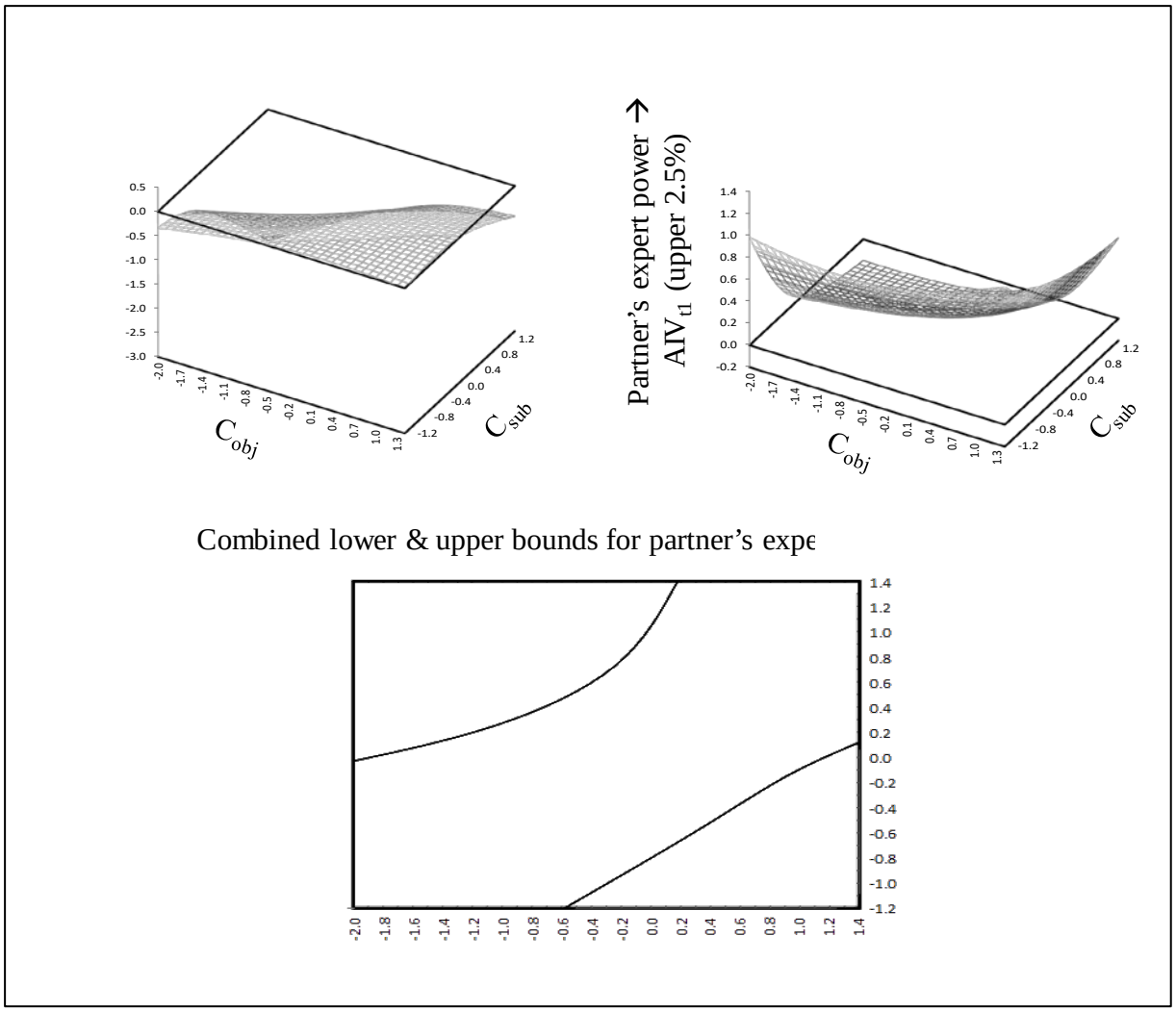

Fig. 2 Marginal effect of partner's expert power on AIV_{t1} under varying competition levels.

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