



RESEARCH NOTE

A relational view on the performance effects of international diversification strategies

H. Emre Yildiz¹,
Sergey Morgulis-Yakushev²,
Ulf Holm³ and
Mikael Eriksson^{2,3}

¹Mälardalen University, Box 883,
72123 Västerås, Sweden; ²Stockholm School of
Economics, Box 6501, 11383 Stockholm, Sweden;
³Uppsala University, Box 513, 75120 Uppsala,
Sweden

Correspondence:
HE Yildiz, Mälardalen University, Box 883,
72123 Västerås, Sweden
e-mail: emre.yildiz@mdu.se

Abstract

International diversification is a fundamental pillar of multinational corporations' (MNCs) growth strategies. Consequently, there is a considerable body of research on the performance implications of MNCs' international diversification strategies. We extend this literature by adopting a relational view where we compare the diversification profiles of firms in an inter-organizational context. We argue that the relative characteristics of firms' and their partners' diversification profiles is an indicator of parties' resource bases and thereby can explain if and when inter-organizational ties yield optimum performance outcomes. We examine these relative characteristics and propose a conceptual refinement by differentiating between the *degree* and *content* dimensions of international diversification. Analyzing data from 202 manufacturing firms from the S&P 500 list, we find that firms achieve optimum performance when their partners have moderately higher degrees of international diversification and a moderate overlap of presence in foreign markets.

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INTRODUCTION

There has been significant academic interest in the antecedents and performance implications of international diversification strategies of multinational corporations (Wan, Hoskisson, Short, & Yiu, 2011). The leitmotif of this research has been how multinational corporations (MNCs) can maximize returns from their resources and capabilities by diversifying into different geographic markets (Mayer, Stadler, & Hautz, 2015; Tallman & Li, 1996). Performance effects of international diversification derive from achieving scale/scope economies, increased market power, cross-leveraging core competencies across multiple markets, spreading risks, and reduction in transaction costs (for a review, see Hitt, Tihanyi, Miller & Connelly, 2006). In this regard, extant research has predominantly focused on the duplication and transfer of resources and capabilities across different business units within MNCs and performance

implications of diversification (e.g., Alessandri & Seth, 2014; Mayer et al., 2015; O'Brien, David, Yoshikawa, & Delios, 2014).

We extend the aforementioned stream of research by studying how resources and capabilities could flow *between* organizations with different international diversification profiles. This idea primarily stems from the view that no firm is an island and that firms engage in a complex web of relationships and resources exchanges inside inter-organizational networks (Håkanson & Snehota, 1990). We build on the notion that a firm's diversification profile could be seen as the reflection of intangible resources and capabilities it develops over time (see Soda & Furlotti, 2017). In the words of Zahra, Ireland and Hitt (2000: 928), "exposure to, and direct involvement with, businesses and customers in multiple countries is an important means of 'learning by doing.'" Based on this, our main point of departure is that when firms diversify into different markets, they will develop different kinds of resources that are specifically suited to the characteristics of the markets in which they have expanded (Yeoh, 2004). These inter-organizational differences in terms of resource bases will in turn create the opportunity for firms to learn from each other's varied experiences. Accordingly, we claim that an MNC can benefit from diversification-driven capabilities and resources of its network partners, which in turn can have positive effects on its performance. Opportunities for learning and higher performance through inter-organizational resource transfer may be realized to the extent that partners' expansive resource repertoire provide richer and/or non-redundant information and insights about doing business in foreign markets. However, too much divergence between firms could make it difficult for focal firms to identify and absorb knowledge from network partners, which could in turn hamper opportunities for learning and resource transfer. Therefore, co-examining diversification profiles of firms could identify the particular conditions under which inter-organizational relationships can lead to optimum performance for the focal firms.

As a corollary of our relational view on diversification, we extend the existing research by identifying two distinct aspects of a firm's international diversification profile: degree and content (Figure 1). The *degree* dimension refers to the extent to which firms' operations are spread across different countries. The degree of diversification can thereby capture the quantitative *gap* between the

knowledge bases of network partners. This is essential to identify whether a focal firm could achieve higher performance when establishing relationships with partners with a lower, the same, or a higher degree of diversification. On the other hand, the *content* dimension refers to which foreign markets the firm and its partners have expanded into and indicates if they conduct business in similar or different geographic markets. In other words, the content dimension identifies the qualitative *overlap* between focal and connected firms in terms of the domain of their knowledge and capabilities. This makes it possible to specify if optimal inter-firm relationships occur when firms have extracted their resources and capabilities from similar or dissimilar market contexts.

Our relational approach to diversification contributes to the literature by introducing an alternative conceptual view – and practical use – for firms' diversification strategies. Specifically, diversification profiles could be considered an overt signal that guides potential partner selection. Earlier research on partner selection has focused chiefly on indicators of match quality (e.g., trust, status, culture) that are hard, if not impossible, to assess *ex ante*. Mitsuhashi and Greve (2009) note that this has "led to neglect of observable criteria, which are also fundamental in [partner] matching." We argue that the diversification profile of a prospective partner, as a visible manifestation of its resources and capabilities, functions as a helpful and directly observable decision criterion that facilitates potential partner evaluation and relationship development.

THEORY AND HYPOTHESIS

Research on strategic alliances and networks has shown that inter-organizational ties enable firms to access and use each other's complementary assets and resources (Das & Teng, 2000). In this paper, we examine a specific type of network tie – i.e., interlocking directorates, which are established "when a person is on the board of directors of two or more corporations, providing a link or interlock between them" (Fich & White, 2005: 175). Accordingly, in the present study, we refer to network partners to denote those firms with which the focal MNC has established at least one interlocking directorate tie. Drawing on resource dependence and organizational learning theories, research has shown that board interlocks can give access to diverse and unique information held by other

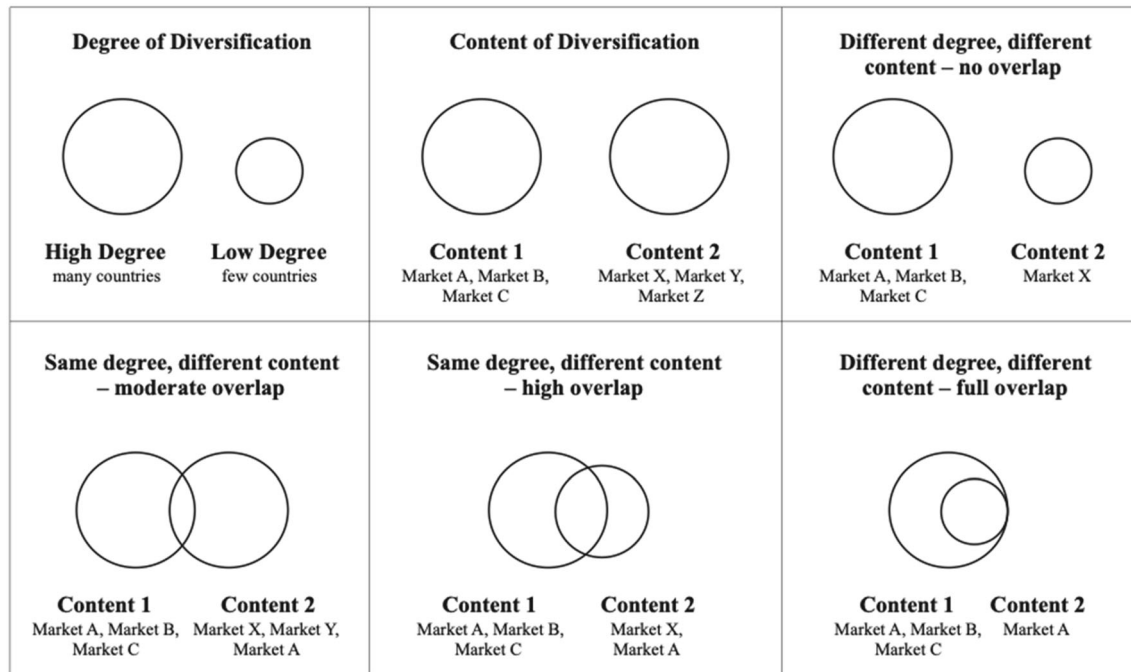


Figure 1 Conceptual distinction between the degree and content of diversification.

companies (Beckman & Haunschild, 2002; Howard, Withers, & Tihanyi, 2017). Hence, interlocking directorates facilitate vicarious learning between organizations and reduce uncertainty about strategic choices (Connelly, Johnson, Tihanyi, & Ellstrand, 2011; Tuschke, Sanders, & Hernandez, 2014). This becomes possible in several ways. First, by sending executives to the board of another firm and enabling them to participate in the decision-making processes of partners, a focal firm can more closely observe other firms’ strategies in situ. This would, in turn, further a focal firm’s capabilities to identify emerging trends, discover overlooked possibilities, learn new ways of dealing with existing problems, and tap into complementary information and skills to solve new problems (Haunschild & Beckman, 1998).

Similarly, outside directors can be valuable participants/advisers in a focal firm’s board discussions due to their experience with successful and failed strategies pursued at other firms (Mizruchi, 1996). Westphal, Seidel, and Stewart (2001: 717) find that interlocking ties facilitate “the imitation of an underlying decision process or script that can be adapted to multiple policy domains.” In a similar vein, Beckman and Haunschild (2002: 93) note that the “interlock network [...] has been shown to affect firms’ decisions because directors bring their experiences with similar decisions in other

companies to bear on the current decision.” Furthermore, interlocking directorates can help firms better integrate with their environment and gain legitimacy by assisting focal organizations to use their interlocking ties to establish relationships with relevant third-party stakeholders (Martin, Gözübüyük, & Becerra, 2015). Empirical studies have largely corroborated these contentions and shown that joint board members can foster the provision of resources to the focal company (Hillman & Dalziel, 2003), advise top management during strategic decision-making (Kor & Sundaramurthy, 2009), and enhance the human and social capital of the focal firm (Basuil & Datta, 2017).

Relative Degree of Diversification

Successful international growth requires *general internationalization knowledge*, which refers to organizational routines to manage overseas operations (Johanson & Vahlne, 1977). Among other things, such routines include “abilities to search for information, to identify and evaluate opportunities, screen country markets, evaluate strategic partners, and manage customs operations and foreign exchange” (Fletcher & Harris, 2012: 632). Eriksson, Johanson, Majkgård and Sharma (1997: 345) highlight the non-location-bound nature of this knowledge by noting that “accumulated experience in internationalization is neither specific to a country

nor a mode of entry.” Casillas and Moreno-Menéndez (2014) emphasize that general internationalization knowledge accrues from increased variation and requires extensive experience in heterogeneous countries (see also Eriksson et al., 2000). Therefore, the level of general internationalization knowledge is directly related to the degree of international diversification. This stands to reason that those outside directors who come from highly diversified firms can provide valuable resources drawn from heterogeneous contexts. Inter alia, these resources might include knowledge about technological patterns and commercial opportunities (Mizruchi, 1996), tacit knowledge about formal and informal rules of doing business (Caiazza, Cannella, Phan, & Simoni, 2019), strategic insights about future trends (Howard et al., 2017), relational embeddedness in different institutional environments (Zona, Boyd, & Haynes, 2019), efficacy and legitimacy of strategies used within particular contexts (Haunschild & Beckman, 1998), and experiential knowledge, skills, and best practices developed about the established strategy in corresponding product segments and foreign markets (Tuschke et al., 2014). This would help a focal MNC to manage risks and complexities of internationalization by developing internationalization capabilities required to coordinate, manage, and harmonize a firm’s relationships with different subsidiaries, suppliers, and customers in various country contexts (Chen, Hsu, & Chang, 2016).

Beyond a certain point, the variety of resources available in the network may eventually be detrimental to performance because of the higher costs of integrating heterogeneous knowledge. Hamel (1991: 97) argues that “if the skill gap between partners is too great, learning becomes almost impossible,” since the recipient firm may find it difficult “to identify, if not retrace, the intermediate learning ‘steps’ between its present competence level and that of its partner.” If the knowledge gap among interlocking counterparts is too large, the focal firm might find it challenging to establish relevance between its own learning needs and the existing knowledge of the latter (Cummings & Teng, 2003). This idea is also corroborated by earlier studies on absorptive capacity, which attests that firms’ ability to identify, understand and utilize new knowledge is a function of prior cumulative knowledge (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998). More recently, Vasudeva and Anand (2011) theorized that moderate heterogeneity in the portfolio of partnerships facilitates access

to unique external capabilities that could foster innovation and reduce uncertainty. They find support for their curvilinear hypothesis and show that high variation among partners minimizes the potential for synergies and imposes additional demands to integrate capabilities, which in turn causes the costs to exceed the potential knowledge utilization benefits from partners.

Based on the above, we develop the following hypothesis:

Hypothesis 1: The gap between the focal MNC’s and its partners’ degrees of international diversification has an inverted U-shaped relationship with the focal MNC’s performance.

Relative Content of Diversification

The content dimension captures the extent to which firms’ diversification strategies are directed towards similar or different overseas markets and thereby generate compatibility or complementarity between firms. In the case of *compatibility*, congruence of management practices, operating systems, and cultural values is required to realize the synergistic potential of partnership (Sarkar, Echambadi, Cavusgil, & Aulakh, 2001). Thus, the similarity between partners lowers coordination costs, alleviates potential misunderstandings, maintains good communication, and develops trust-based working relationships (Vissa, 2011). The similarity in terms of capabilities and skills would also increase the relevance between partners’ knowledge, which in turn help them to identify, assimilate, and use each other’s knowledge and capabilities (Lane & Lubatkin, 1998). On the other hand, *complementarity* suggests that inter-organizational relationships can yield benefits when partners have different resources and capabilities, which could be combined to create synergies and collective value (Mitsuhashi & Greve, 2009). Partner firms are more likely to develop complementary (i.e., non-redundant) resource repertoires if they diversify into dissimilar (i.e., non-overlapping) foreign markets.

By combining mechanisms of compatibility and complementarity, we claim that extreme cases of similarities (overlap) and dissimilarities (non-overlap) between partners’ resource compositions undermine potential gains from director interlocks and divert the focal MNC away from optimal performance. The focal MNC can benefit from interlocked partners’ varied experiences in different geographic markets with idiosyncratic characteristics. Interlocking ties with internationally

diversified organizations can increase the focal MNC's social capital and embeddedness across different geographic markets (Chen et al., 2016). This way, it can "readily draw on [partners'] existing foreign relationships with customers, partners, suppliers, government officials, and intermediaries" (Elango & Pattnaik, 2007: 546). However, such relational resources might be more beneficial if they are drawn from host countries that are contextually similar to those host markets where the focal MNC currently operates and/or intends to expand into. This is because to manage their overseas operations strategically, firms rely on market-specific knowledge, which generally refers to "knowledge about characteristics of the specific national market – its business climate, cultural patterns, the structure of the market system" (Johanson & Vahlne, 1977: 28). Given that partners' market-specific knowledge and relational assets are context-dependent, the focal MNC can benefit from these resources when its operations are located in host countries that are contextually similar to the country portfolio of its partners. Therefore, the applicability and usefulness of market-specific knowledge and resources would depend on the degree of overlap between the focal MNC's and its partners' international diversification profiles.

In sum, we expect to observe a non-linear relationship between the level of resource overlap and the realization of network benefits. Accordingly, we hypothesize that:

Hypothesis 2: The overlap between the focal MNC's and its partners' content of international diversification has an inverted U-shaped relationship with the focal MNC's performance.

METHODOLOGY

Data Sources and Sample

Our sample consists of firms listed in Standard & Poor's (S&P) 500. The S&P 500 list covers a variety of industries and thus allows a broader generalization of the results to the population of US MNCs. To define our sample frame, we first selected MNCs that are listed for the year 2017, had operations in all three major regions (i.e., North America, Europe, and Asia-Pacific), and had a share of sales and assets located in these regions that were not lower than 10% (cf. Osegowitsch & Sammaritano, 2008). Second, we chose to focus on manufacturing firms

(designated by Standard Industrial Classification [SIC] code 2000–3999). This resulted in a final sample of 202 MNCs (37.41%). On average, the share of foreign to total sales of these MNCs was 44.9%, which was distributed across different continents as follows: Africa (6.73%), Asia (14.03%), Australia (0.61%), Europe (14.84%), North America - excluding the US (4.95%) and South America (2.93%). The average number of foreign countries operated by each selected MNC was 75 (min. 8 and max. 173).

Financial data and other firm-level variables were retrieved from the Orbis and Compustat databases (including Compustat Capital IQ and Compustat Segments). Foreign sales data on the country level were retrieved from the Orbis database. To identify the network partnerships, we selected all firms that had at least one interlocking tie with the focal MNCs included in our sample. The interlocking network comprised both domestic and cross-border ties formed between focal firms and their partners. Interlocking directorates data were taken from BoardEx – North America and Orbis, which includes detailed information about common board memberships. Our sample of network firms consists of 1479 interlocking partners, of which 7% were international and 93% were domestic. The average number of partners per focal firm was 7.42.

Dependent and Independent Variables

We used return on assets (ROA) as an accounting-based measure of focal *firm performance*. Data for calculating the dependent variable were obtained from the Compustat database, which was measured at the last available year ($t = 2017$), while all the remaining variables were measured with a 1-year lag ($t - 1 = 2016$).

The *degree of international diversification* was operationalized by the widely used entropy measure developed by Palepu (1985). Following past research (Hitt, Tihanyi, Miller, & Connelly, 2006), our measure captures both the variation of international operations and the relative importance of each country's market. We therefore introduced a slight modification to the entropy index by accounting for the distance of each foreign market to the US and developed the following formula:

$$ID = \sum M_i \ln \left(\frac{1}{M_i} \right) \cdot GD_i \quad (1)$$

where M_i is the sales at the i th market as a share of the firm's total sales, $\ln(1/M_i)$ is the weight of each

market and GD_i is the geographic distance between the home market (the US) and i th country market. Since Compustat Segments only provided data on global segments at the regional level, it was not suitable for collecting detailed data to capture international diversification. Therefore, we followed the same approach as Chang, Kogut, and Yang (2016) and used the Orbis database to measure international diversification. This database records each firm's ticker symbol along with foreign subsidiary information at the country level, which enabled us to match data from Compustat segments with subsidiary information. Data for geographical distance was collected from the distance matrices available by the Paris-based Centre d'études prospectives et d'informations internationales (CEPII, 2007).

We used Eq. 1 to calculate the degrees of international diversification for both the focal MNC and each firm with which it had a least one interlocking network tie. Next, the average degree of diversification gap was computed by the following formula:

$$GID = \frac{1}{n} \cdot \sum_1^n (ID_k - ID_f) \quad (2)$$

where GID is the average international diversification gap the focal firm has with its interlocking partners, n is the total number of partners, ID_k is the degree of international diversification of k th interlocking partner, and ID_f is the focal firm's degree of international diversification.

For the *overlap in the international diversification content* (OID), we identified the intersection of host markets in which the focal MNC and each partner operated simultaneously. We also considered the number of exclusive host markets in which only the network partner operates, which denotes their unique and non-redundant domains of expertise. Formally:

$$OID = \frac{1}{n} \cdot \sum_1^n \frac{|FM_f \cap FM_k|}{|FM_k|} \quad (3)$$

where FM_f and FM_k represent the set of host markets in which the focal firm and its k th interlocking partner operate, respectively. Accordingly, our measure of content overlap is calculated by the mean ratio of the number of host markets in the intersection to the total number of host markets the network partners operate in. Possible values of OID range between 0 (no overlap) and 1 (full overlap).

Controls

To rule out alternative explanations, we included a set of firm-level (i.e., firm age, international experience, advertising intensity, R&D intensity, capital intensity, and financial leverage) and managerial-level (i.e., CEO age, tenure, duality, and gender) control variables that could influence focal firms' performance. Additionally, we admit that, at the aggregate level, a moderate average diversification gap can mean (1) close-to-average moderate gaps, as well as (2) highly positive and highly negative gaps, also resulting in a moderate average gap. Since we developed our hypotheses according to the first conceptual archetype, we entered the *heterogeneity of the gap* into the regression as a control variable. Our theory implies that extreme deviations from the mean (highly positive and negative gaps) contrast with optimal resource exchange and learning conditions between partners. Therefore, we predict that the heterogeneity of the gaps will reduce the focal firm's performance.

Analytical Method

We used a second-order polynomial regression model to test our hypotheses. To avoid multicollinearity between the first- and second-order terms in the second-order regression, we standardized (mean = 0, standard deviation = 1) the independent and dependent variables. Table 1 shows descriptive statistics and the correlation matrix of all variables. We also examined variance inflation factors (VIF) and found that the maximum VIF is 3.692, lower than the commonly accepted threshold values for multicollinearity (Hair, Anderson, Tatham, & Black, 1998).

To test our hypotheses, we regress the focal firm's performance (Y) on the first- (X) and second-order (X^2) terms of gap and overlap of international diversification between the focal and network firms:

$$Y_t = \beta_1 X_{t-1} + (\beta_2 X_{t-1})^2 + \delta_{t-1} + \text{Controls}_{t-1} + \text{Error} \quad (4)$$

This equation also incorporates industry fixed effects (δ) to account for heterogeneity across industries, where a two-digit SIC code was used for industry classifications (obtained from the Orbis database).

We used lagged explanatory variables, identified as one of the efficient technical solutions to the endogeneity and reverse causality problems (Meyer, Witteloostuijn, & Beugelsdijk, 2017). We further sought to handle endogeneity by conducting two-

Table 1 Descriptive statistics and correlation matrix

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 ROA	0.06	0.07														
2 Gap in degree of international diversification	0.00	1.00	0.17													
3 Overlap in content of international diversification	0.00	1.00	-0.11	0.14												
4 Gap in degree of product diversification (Instrumental Variable)	0.00	1.00	0.07	-0.21	0.07											
5 Overlap in content of product diversification (Instrumental Variable)	0.00	1.00	0.12	-0.04	-0.23	0.05										
6 Firm age	34.09	23.42	-0.12	-0.13	0.11	0.09	-0.09									
7 R&D intensity	0.03	0.11	0.29	0.26	-0.16	0.14	0.16	-0.05								
8 Advertising intensity	0.01	0.02	0.15	0.10	-0.09	0.10	0.11	-0.05	-0.03							
9 International experience	4.94	2.03	0.03	0.02	-0.07	-0.04	-0.04	0.06	-0.02	0.03						
10 Capital intensity	0.07	0.16	-0.04	-0.07	0.11	-0.10	0.04	-0.03	0.07	0.00	-0.01					
11 Financial leverage	0.39	0.18	-0.47	-0.01	0.00	0.02	-0.03	0.03	0.01	-0.02	0.06	-0.01				
12 CEO age	54.83	6.63	0.04	0.03	-0.04	0.03	-0.05	0.07	0.06	0.04	-0.05	0.03	0.01			
13 CEO tenure	6.21	5.84	0.03	0.02	0.01	-0.05	0.03	-0.04	0.09	0.01	0.03	-0.10	-0.06	0.36		
14 CEO duality	0.46	0.48	0.02	-0.05	0.03	0.07	-0.01	0.03	-0.01	0.05	0.11	-0.03	0.06	0.18	0.24	
15 CEO gender	0.22	0.17	-0.01	0.02	-0.04	-0.03	0.00	-0.04	0.03	-0.07	-0.08	0.00	-0.05	0.07	-0.09	0.10

stage least squares analysis, which was used in comparable studies in IB literature (e.g., Hashai & Delios, 2012; Hashai, 2015). This technique takes account of the correlation in the disturbance term across equations, thereby producing more efficient estimates (Wooldridge, 2010). Accordingly, in the first stage, we estimated the gap and overlap of international diversification (i.e., independent variables). These estimated values were then used in the second stage for formal hypothesis testing. To address endogeneity problems, it is important to select suitable instrumental variables (IVs) that are correlated with the independent variable but uncorrelated with the dependent variable (Papies, Ebbes, & Heerde Van, 2017). We used first- and second-order terms of gap (overlap) of product diversification as IVs to calculate the estimated values of gap (overlap) of international diversification. To measure the *gap and overlap of product diversification* between the focal and network firms, we followed the same approach with the gap/overlap of international diversification, except that we used product segments (in lieu of foreign markets) in which the focal MNC and its network partners were active. The gap in degree (overlap in content) of product diversification was indeed negatively correlated with gap in degree (overlap in content) of international diversification, but not with ROA (see Table 1). Accordingly, we conclude that our IVs fulfill the relevance and exclusion criteria (Kennedy, 2008).

ANALYSIS AND RESULTS

Tables 2 and 3 present the first-stage regression results. We found that all IVs are statistically significant. The F-values of excluded instruments are all larger than the critical number of 10 proposed by Staiger and Stock (1997), thus corroborating the strength of the chosen IVs and the robustness of the first-stage regressions.

Tables 4 and 5 report the results of the second-stage regression models where firm performance (ROA) was the dependent variable. We followed the three-step procedure suggested by Lind and Mehlum (2010) and Haans, Pieters and He (2016) for a rigorous test of our curvilinear hypotheses. In the first step, we show that the coefficient of the quadratic term is significant and has the expected sign. The coefficients β_2 for the second-order term of gap ($\beta_2 = -0.307, p < 0.001$) and overlap ($\beta_2 = -0.219, p < 0.001$) of international diversification were negative and significant. Second, one must

ascertain that the slope of the curve at both the low end (i.e., X_L) and high end (X_H) of the data range is sufficiently steep. If only one of these slopes is significant, the actual relationship can be represented as a logarithmic or exponential function rather than an inverted U-shaped curve. For the gap of international diversification, the slopes at the low and high end of the data range were 1.917 ($p < 0.001$) and -1.484 ($p < 0.001$), respectively. Similarly, for the overlap dimension, we detected a positive slope at X_L (1.131, $p < 0.001$) and a negative slope at X_H (-1.361 , $p < 0.001$). Thus, the second condition of the inverted U-shaped relationship between X and Y was fulfilled. Lastly, the inflection point must remain within the data range to ensure that the data fully reveal the hypothesized curve. This should be checked by equating the first derivative of Eq. 1 to zero to find the turning point (i.e., $-\beta_1/2\beta_2$), showing that both lower and upper bounds (with 95% confidence interval) for the inflection point are located within the data range. In terms of the gap in degree of international diversification, we found that the inflection point was achieved at 0.313 (i.e., slightly to the right of the zero-gap $X = 0$). The 95% confidence interval of the inflection point [0.140, 0.486] also lies within the data range. The inflection point for the overlap in the content of international diversification was found to be at -0.397 with a 95% confidence interval of $[-0.561, -0.233]$, which also lies

within the data range. Altogether, the results lend statistical support for Hypothesis 1 and Hypothesis 2.

Figures 2 and 3 illustrate the estimated relationships, the confidence interval for the inflection points, and the two lower bounds on the slopes in each endpoint. In preparing these figures, we have used average values for all the controls.

ROBUSTNESS TESTS

We conducted several robustness tests to rule out alternative explanations and assess whether our findings were sensitive to model specifications. First, to confirm that the observed relationship is indeed quadratic, we added a cubic term (X^3) to Eq. 4 to rule out that an S-shaped curve would have fitted better with our data (see Table 6). This did not improve model fit (the change in F_H -statistic was insignificant for both models), and thus there is stronger support for a quadratic relationship. We also omitted the second-order term (X^2) from Eq. 4 to test the model fit of a linear relationship but found that the quadratic term significantly improved the model fit (change in F_L -stat is significant at $p < 0.001$ for both models).

Second, we tested whether our estimates were consistent over different outcome specifications and re-estimated models with alternative performance indicators (i.e., return on sales, return on equity, and Tobin's q). None of the results changed

Table 2 First-stage regression models for the gap in degree of international diversification between the focal and network firms

Variables	Gap in degree of international diversification	Gap in degree of international diversification – squared
Gap in degree of product diversification between the focal and network firms (Instrumental Variable)	-0.263 [0.000]	0.179 [0.000]
Gap in degree of product diversification between the focal and network firms – squared (Instrumental Variable)	0.198 [0.000]	-0.238 [0.000]
Heterogeneity of gaps between the focal firm and network partners	-0.164 [0.000]	0.159 [0.000]
Firm age	0.026 [0.361]	0.017 [0.418]
R&D intensity	-0.045 [0.308]	0.016 [0.435]
Advertising intensity	0.163 [0.002]	-0.159 [0.001]
International experience	0.046 [0.301]	-0.051 [0.274]
Capital intensity	0.127 [0.064]	-0.103 [0.071]
Financial leverage	0.073 [0.182]	0.004 [0.531]
CEO age	0.058 [0.216]	-0.081 [0.205]
CEO tenure	0.062 [0.247]	0.034 [0.294]
CEO duality	0.006 [0.483]	0.091 [0.201]
CEO gender	-0.048 [0.311]	0.027 [0.371]
Adjusted- R^2	0.228	0.215
F-stat	11.859	11.437

The number of observations is 202. Exact p values in brackets.

Table 3 First-stage regression models for overlap in the content of international diversification between the focal and network firms

Variables	Overlap in content of international diversification	Overlap in content of international diversification – squared
Overlap in content of product diversification between the focal and network firms (Instrumental Variable)	– 0.211 [0.000]	0.184 [0.000]
Overlap in content of product diversification between the focal and network firms – squared (Instrumental Variable)	0.203 [0.000]	– 0.199 [0.000]
Heterogeneity of overlaps between the focal firm and network partners	– 0.137 [0.000]	0.168 [0.000]
Firm age	– 0.019 [0.431]	0.032 [0.375]
R&D intensity	– 0.103 [0.214]	0.003 [0.411]
Advertising intensity	0.115 [0.206]	– 0.127 [0.199]
International experience	– 0.031 [0.384]	0.044 [0.316]
Capital intensity	0.105 [0.267]	– 0.092 [0.283]
Financial leverage	0.071 [0.312]	0.016 [0.421]
CEO age	– 0.045 [0.353]	0.031 [0.376]
CEO tenure	0.058 [0.308]	0.034 [0.369]
CEO duality	0.041 [0.337]	0.073 [0.279]
CEO gender	0.003 [0.404]	0.021 [0.324]
Adjusted-R ²	0.212	0.206
F-stat	12.836	11.561

The number of observations is 202.

Exact *p* values in brackets.

Table 4 Second-stage regression models for the relationships between the gap in degree of international diversification and focal firm's performance

Variables	Focal firm's performance
Gap in degree of international diversification between the focal and network firms (<i>X</i>)	0.192 [0.000]
Gap in degree of international diversification between the focal and network firms — squared (<i>X</i> ²)	– 0.307 [0.000]
Heterogeneity of gaps between the focal firm and network partners	– 0.161 [0.000]
Firm age	0.081 [0.218]
R&D intensity	0.003 [0.397]
Advertising intensity	– 0.063 [0.228]
International experience	0.007 [0.350]
Capital intensity	0.046 [0.267]
Financial leverage	– 0.014 [0.306]
CEO age	0.003 [0.412]
CEO tenure	0.006 [0.471]
CEO duality	0.001 [0.503]
CEO gender	0.002 [0.491]
Adjusted-R ²	0.298
F-stat	10.308

The number of observations is 202. Exact *p* values in brackets.

The slope at low end of the data range X_L is $\beta_1 + 2\beta_2 X_L = 1.917$ [0.001].

The slope at high end of the data range X_H is $\beta_1 + 2\beta_2 X_H = -1.484$ [0.001].

The inflection (optimal) point is achieved when $X = -\beta_1/(2\beta_2) = 0.313$.

95% confidence interval of the inflection (optimal) is [0.140, 0.486].

in magnitude or direction with these alternative operationalizations. Third, we re-estimated the models using 2-year lags between the independent and dependent variables. Again, the results were largely in line with what we report in Tables 4 and 5.

DISCUSSION AND CONCLUSION

Received IB research on value creation stemming from knowledge transfer and collaboration in inter-organizational relationships has focused chiefly on vertical and/or lateral ties within the MNC as well

Table 5 Second-stage regression models for the relationships between overlap in the content of international diversification and focal firm performance

Variables	Focal firm's performance
Overlap in content of international diversification between the focal and network firms (X)	-0.174 [0.000]
Overlap in content of international diversification between the focal and network firms – squared (X^2)	-0.219 [0.000]
Heterogeneity of overlaps between the focal firm and network partners	-0.170 [0.000]
Firm age	0.079 [0.225]
R&D intensity	0.004 [0.408]
Advertising intensity	0.013 [0.311]
International experience	-0.051 [0.273]
Capital intensity	0.038 [0.298]
Financial leverage	-0.019 [0.374]
CEO age	0.004 [0.416]
CEO tenure	-0.006 [0.401]
CEO duality	0.002 [0.379]
CEO gender	0.001 [0.421]
Adjusted- R^2	0.274
F -stat	10.783

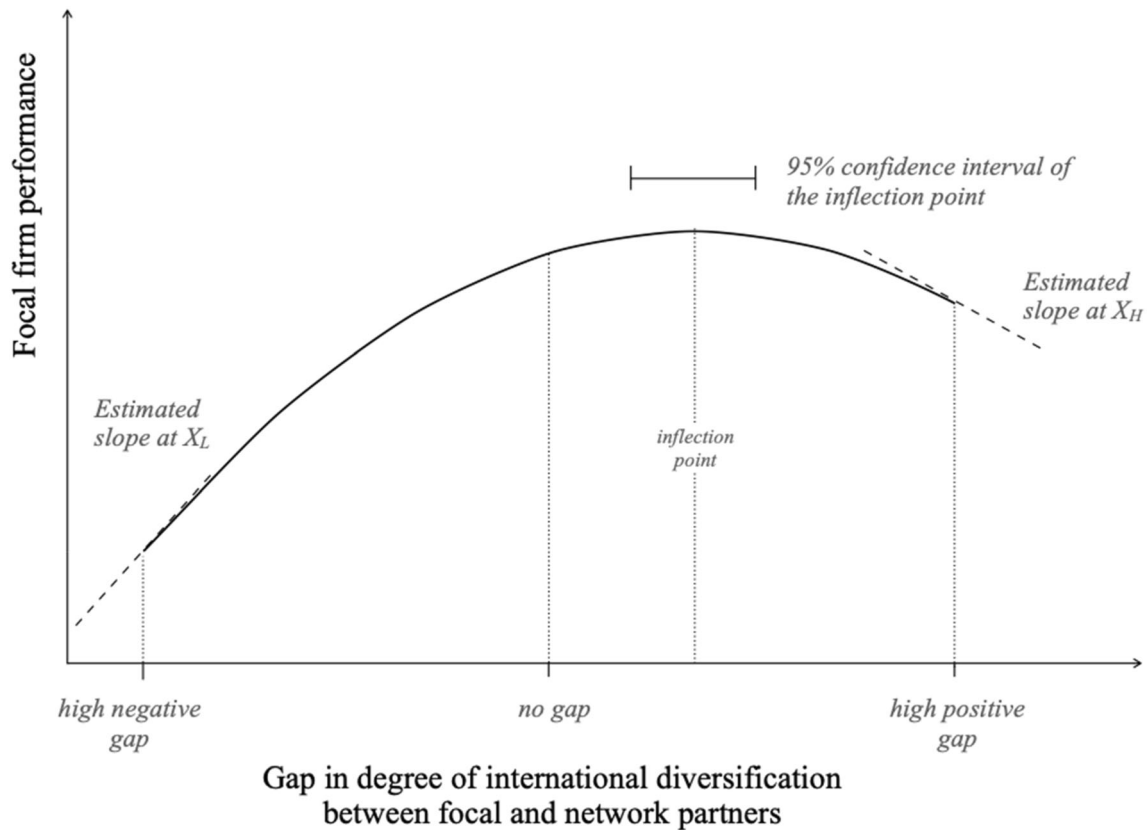
The number of observations is 202. Exact p values in brackets.

The slope at low end of the data range X_L is $\beta_1 + 2\beta_2 X_L = 1.131$ [0.001].

The slope at high end of the data range X_H is $\beta_1 + 2\beta_2 X_H = -1.361$ [0.001].

The inflection (optimal) point is achieved when $X = -\beta_1/(2\beta_2) = -0.397$.

95% confidence interval of the inflection (optimal) is $[-0.561, -0.233]$.


Figure 2 Gap in degree of international diversification and focal firm performance.

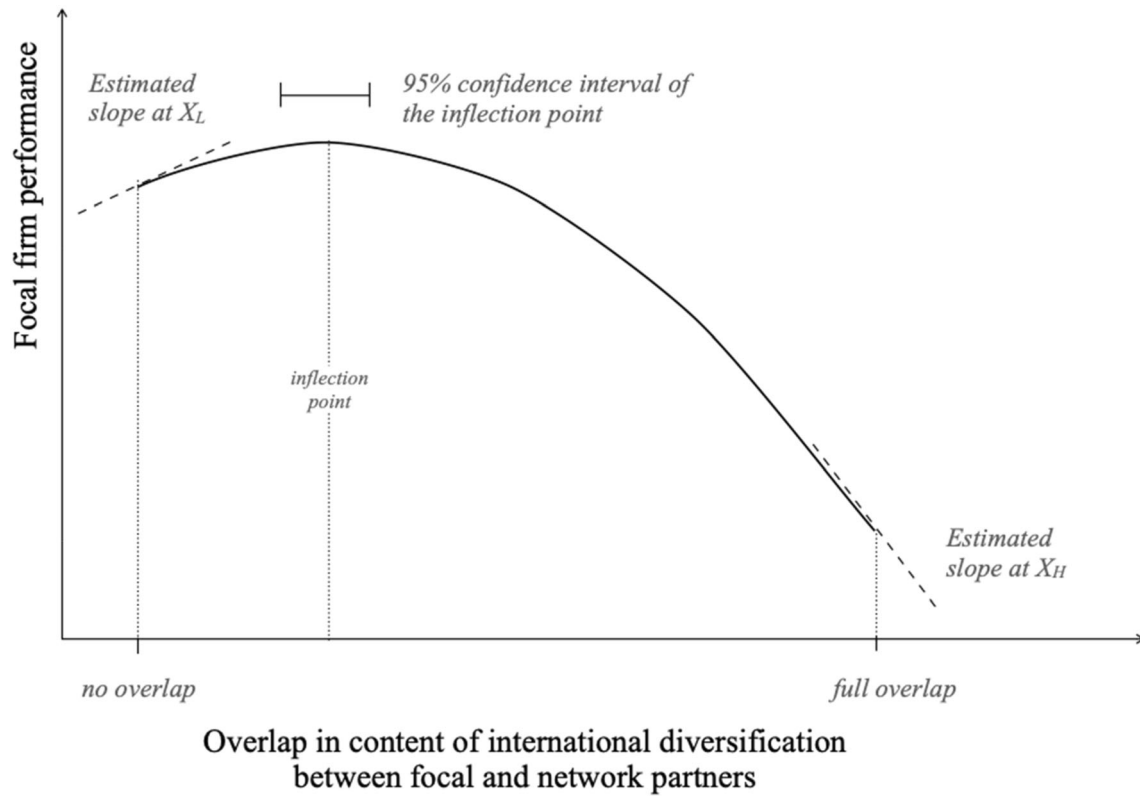


Figure 3 Overlap in content of international diversification and focal firm performance.

Table 6 Second-order model validation

Model	Hypothesis	F_H	F_L
Gap in degree of international diversification	H1	0.093	10.805
Overlap in content of international diversification	H2	0.096	11.284

$n = 202$.

The row labeled F_H contains F -ratios for the test of higher-order terms, which for the quadratic equation include the cubic term X^3 . This condition provides support for the second-order model when their associated statistical test is not significant.

The row labeled F_L contains F -ratios for the test of second-order terms, which include the quadratic term X^2 . This condition provides support for the second-order model when their associated statistical test is significant.

as on business relationships with external partners at the subsidiary level (e.g., Michailova & Mustaffa, 2012). In contrast, the present study has investigated the importance of board interlocked relationships (at the upper echelons) with external partners. We find that the relative international diversification profiles of their network partners affect the performance of focal MNCs. We distinguished two aspects of international diversification – i.e., the gap in degree and overlap in content. Our results show that the relationships between diversification gap and overlap and the performance of focused MNCs follow inverted U-shaped patterns.

In sum, our findings confirm that the effectiveness of utilizing new knowledge through the inter-partner relationships depends on a balance of

moderate differences between partners’ international diversification into foreign markets and shared presence on some markets. This observation relates to studies on absorptive capacity in the IB field, which has predominantly paid attention to the importance of organizational factors as antecedents to successful inter-organizational knowledge absorption (Levinthal & Rerup, 2006; Luo, 2020; Pedersen, Larsen & Dasi, 2020). However, the ideal level of relevance between new and existing knowledge has generally been neglected. Our study strongly indicates the importance of this issue. We confirm that moderate knowledge gaps and overlaps in terms of international diversification will provide bases of relative differences in market knowledge that matter to the performance level of

focused MNCs. When the difference of these knowledge bases is (too) high, we may expect higher organizational challenges to absorb the knowledge, which stands against the fact that knowledge superiority offered in partner relationships can potentially be more attractive. This dilemma should be of interest in studies of how the relations between organizational characteristics and absorptive capacity are moderated by variations in knowledge differences between MNCs and their network partners.

From a managerial point of view, our findings suggest that the selection of network partners with which MNCs share interlocked managers is a strategic decision. The fact that the relative gap in number and overlap of markets are observable characteristics (Mitsuhashi & Greve, 2009) suggests that these criteria could guide the process of relationship development through interlocking ties. Network partner selection can partly be based on maintaining a balanced partnership portfolio in terms of firms' relative international diversification profiles. However, one intricate managerial issue stemming from our results is if and how MNCs can uphold their relative diversification profile vis-à-vis its network partners at a stable optimum level? Given that MNCs continuously adjust their international operations by expanding or withdrawing from country markets, which may also be the case of their network partners, the nature of new knowledge change and affect the value of the partners' relationships. Sustaining an optimum partnership portfolio would require continuous adjustments by bringing in relevant outside interlock directors to the boards of the MNCs and careful consideration of where to send their own directors.

The main limitation of our present investigation is that we did not directly measure the transfer of resources and capabilities between firms. Interlocking ties can generate the opportunity for firms to exchange resources. However, such opportunities may not always be realized because of several firm-level (e.g., organizational, and national culture, network position) individual-level (e.g., personal characteristics and/or agenda of top management teams,) and tie-level (e.g., duration, strength, direction) factors, which we kept outside the scope of our study. More importantly, partners' resources could also vary to a considerable extent in terms of their relation to the core capabilities of firms, asset specificity, transferability, etc. Therefore, future research can use alternative empirical designs and

collect primary data that could permit direct measures for the extent *and* nature of resource exchange between network partners. Furthermore, our empirical study focused on a specific, and relatively smaller, population of firms. Therefore, we invite future studies to test the validity and generalizability of our findings. Last, but not least, we only focused on performance as the outcome variable: there might be alternative forms and preconditions of performance such as innovation or growth. For that reason, we would need additional studies to explore these alternatives in a rigorous way.

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NOTES

¹Strategic management research at large has extensively studied the drivers and consequences of product diversification, as well as the interaction between product diversification and international diversification (e.g., Geringer, Tallman, & Olsen, 2000; Hitt, Hoskisson, & Ireland, 1994; Hitt, Hoskisson & Kim, 1997). We acknowledge that motives, processes, and consequences of international and product diversification could differ. However, both types of diversification encapsulate the development of resources apposite to relevant (product and market) segments, which creates the very potential for inter-organizational resource exchange. Since the issue of knowledge development/accumulation that takes place as a result of expansion into new foreign markets lies at the very center of IB research, we test our relational view only on international diversification. Yet, we would encourage future studies to extend this and examine comparable effects in the domain of product diversification.

²In this paper, we use the term "relative" to refer to the comparative aspects of a focal firm's and its partners' diversification profiles. Thus, relative



characteristics of diversification capture the differences *between* firms concerning their diversification strategies. In this regard, we differ from past research on the relatedness of diversification wherein the main consideration is the extent of within-firm variation in terms of foreign markets (and product segments) served.

³Unlike our earlier reasoning about the degree of diversification, complementarity does not necessitate the focal MNC to establish director interlocks with firms that have more comprehensive diversification content. Indeed, research has shown that firms that are technology specialists (i.e., narrow rather than broad niche) could be more likely to get imitated by other firms due to their more profound knowledge in their respective technology domains (e.g., Rhee, Kim, & Han, 2006). This suggests that, even if the partner firm has fewer segments in its

diversification portfolio, it can still offer relevant, non-redundant, and valuable knowledge to the focal firm. We want to thank one of the anonymous reviewers for bringing this issue to our attention.

⁴We would like to thank one of the anonymous reviewers for this suggestion.

⁵For the sake of brevity, we did not include second-order terms in Table 1. The correlation between second-order terms of international diversification and product diversification gap and overlap were -0.257 ($p < 0.001$) and -0.214 ($p < 0.001$), respectively. Furthermore, focal firm ROA was not correlated with squared values of product diversification gap ($r = -0.042$, $p > 0.100$) and overlap ($r = -0.039$, $p > 0.100$).

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ABOUT THE AUTHORS

H. Emre Yildiz is Associate Professor at the School of Business, Society and Engineering, Mälardalen University. His research examines multi-level antecedents of firms' innovativeness, international growth, and performance. His research has been published in leading academic journals such as *Journal of International Business Studies*, *Journal of World Business*, *Global Strategy Journal*, *Management International Review*, and *International Business*



Review. He received his PhD from the Stockholm School of Economics, and is a Turkish citizen.

Sergey Morgulis-Yakushev is a Researcher at Stockholm School of Economics. His current research primarily focuses on adapting Western management theories and practices to achieve success in local country contexts. Sergey's research has published in *Journal of International Business Studies*, *Global Strategy Journal*, and *Journal of World Business*. He received his PhD from the Stockholm School of Economics. Sergey was born in St. Petersburg, Russia, and is a Russian citizen.

Ulf Holm is Chair Professor of International Business at Uppsala University. His research interests focus on the management of multinationals and the international growth of the firm. His research is published in top international journals and he has written several books. He currently studies the effect of interlocking firm directorates on the international growth of SMEs, the relation between managerial experience and internationalization, and the relation between internationalization and democracy.

Mikael Eriksson is Assistant Professor at the Stockholm School of Economics. He is also

affiliated with the International Business sector at Uppsala University, where he earned his PhD in 2016. Mikael's primary research interest concerns IB and strategy-related research, in particular the international growth of MNCs and SMEs, micro-foundational network relations, and their impact on firms' growth and on strategy creation.

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