

# **The Influence of Top Management Team International Exposure on International Alliance Formation**

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**ABSTRACT** This study examines the effect of top management team (TMT) international exposure on the formation of international alliances. We develop our arguments based on relational capital theory to suggest that top executives with international exposure are critical to firms' international alliance formation. Supporting this view, we find that TMT international exposure is positively associated with the formation of international alliances. Moreover, we find evidence to suggest that the effect of TMT international exposure on international alliance formation is more positive as the level of environmental uncertainty increases. We discuss implications and directions for future research.

## **INTRODUCTION**

In the past two decades, international alliances have received much attention from both academic researchers and business practitioners alike (Hitt et al., 2000; Lane et al., 2001). International alliances can be defined as collaborative organizational arrangements between firms located in different countries (Inkpen, 2001). While previous research has examined a variety of factors that influence the formation of international alliances such as organizational structures, processes, and strategies (Doz and Hamel, 1998; Glaister and Buckley, 1996), noticeably absent is the effect of top executive characteristics on international alliance formation. Doz and Hamel (1998) suggested that one of the most important aspects of 'alliance readiness' is the characteristics and mindsets of individual top executives. Additionally, Dickson and Weaver (1997) emphasized the importance of individual-level influences on decisions by top executives to use alliances. However, the increasing complexity and uncertainty in the competitive landscape have made it difficult for firms to rely solely on the capabilities of the individual top executives. Rather, it is the combined capacity of top management teams (TMTs) that influences value creation and long-term success (Finkelstein and Hambrick, 1996; Greening and Johnson, 1996).

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Previous studies have examined the relationship between TMT international characteristics and firm globalization (Reuber and Fischer, 1997; Sambharya, 1996). More recently, Tihanyi et al. (2000) showed that TMT average tenure, education, international experience, and tenure heterogeneity were positively associated with international diversification. Additionally, Carpenter et al. (2003) found that technology-based initial public offerings (IPO) firms pursued globalization strategies when the TMT and board members possessed international experience. Indeed, the 'dominant trend in recent research involves extension of the original upper-echelons model to the global arena' (Carpenter et al., 2004, p. 10). The focus on TMT international exposure is important because firms need a cadre of global leaders to navigate successfully in today's global environment (Black et al., 1999). Accordingly, our study continues with this important line of research by investigating the effect of TMT international exposure on international alliance formation. More specifically, our study examines the following two research questions: (1) Will firms with greater TMT international exposure form more numbers of international alliances? (2) Will this relationship be more pronounced when the firm faces greater environmental uncertainty? To address these questions, we use the literature on relational capital to develop our theory and hypotheses.

The effect of TMT international exposure on international alliance formation can be both direct and indirect. With regard to direct effects, TMTs are often the conceptualizers of alliance strategies and key sources for providing a set of potential alliance partners (D'Avicni, 1990). In addition, TMTs often serve as the chief negotiators of the alliance agreement (Krishnan et al., 2006). Thus, for an alliance to be formed, a firm's TMT must conceptualize and develop a broad alliance strategy before operating managers can implement them (Arino and Reuer, 2004; Eisenhardt and Schoonhoven, 1996; Reuber and Fischer, 1997). With regard to the indirect effects of TMTs on alliance formation, previous research has suggested that TMT members influence the formation of international alliances through such factors as organizational structures, processes, and cultures (e.g. Doz and Hamel, 1998; Finkelstein and Hambrick, 1996). Accordingly, while the actual implementation of international alliance formation may be conducted at the operating manager level, we argue that the TMT members will influence the formation of international alliances.

Our study contributes to the literature on international alliance formation by suggesting that top teams with greater international exposure facilitate the formation of international alliances. In so doing, we extend and develop relational capital theory to the area of top management teams and international alliances. While recent studies have examined various antecedents to international alliances (e.g. Reuer and Ragozzino, 2006), they did not explicitly examine TMT characteristics as an important antecedent to international alliance formation. By focusing on the capabilities and reputational effects of TMTs on international alliance formation, our study complements previous research.

Finally, to examine our theory, we used an extensive panel data consisting of 263 US firms in 14 industries during the period 1988 to 1995. Panel data approaches offer a number of advantages, including controlling for unobserved heterogeneity, improving statistical estimates by enlarging the sample size, and capturing both average effects

across individual units and dynamic effects across the entire sample (Hitt et al., 1998a; Kmenta, 1986).

## THEORY AND HYPOTHESES

Compared to tactical decisions, strategic decisions are more complex, ambiguous, rare, and important (Mintzberg et al., 1976). This argument stems from the Carnegie School of decision theory in which they argue that 'strategic decisions' result from behavioural outcomes rather than economic optimization because managers are boundedly rational (Cyert and March, 1963; March and Simon, 1958). Based on these prior works, Hambrick and Mason (1984) developed the upper-echelons approach. This literature states that top executives structure decision situations to match their view of the world. In other words, top managers make strategic choices on the basis of their cognitive base and the organization becomes a reflection of its top managers (Finkelstein and Hambrick, 1996). Particularly relevant in the upper-echelons literature is that it emphasizes that 'organizational outcomes are partially predicted by managerial background characteristics' (Hambrick and Mason, 1984, p. 193).

However, some scholars have criticized the upper-echelons approach and its reliance on demographic characteristics to predict organizational outcomes (Certo et al., 2006; Priem et al., 1999). The main concern is the need to access the 'black box' to better understand the intervening mechanisms between TMT characteristics and organizational outcomes. While we acknowledge this limitation of the upper-echelons literature, we would note that there is an abundance of research that has relied primarily on TMT characteristics that have led to significant findings (see Carpenter et al., 2004 for a good review). Therefore, we rely on the basic premise of the upper-echelons literature that managerial background characteristics are important for organizational outcomes.

### TMT International Exposure

While previous research has examined the link between various TMT demographic characteristics and organizational outcomes, scholars have only relatively recently begun to explore the implications of top executive international backgrounds for firms' strategic choices (Carpenter et al., 2004). For example, previous studies have found a positive relationship between TMT international experience and a firms' internationalization (Carpenter and Fredrickson, 2001; Tihanyi et al., 2000). Carpenter et al. (2001) emphasized the importance of developing and nurturing global leaders in order for firms to succeed in the highly competitive global environment.

In the present study, we define TMT international exposure as the extent to which the top management team consists of members with overseas assignment experience, foreign nationalities, and foreign education. Consistent with the upper-echelons perspective, we argue that the international exposure of the top management team is important in organizational settings because top executives' career backgrounds affect their cognitive structures, skills, knowledge, and competencies. In turn, the experiences of executives can have a significant influence on the kinds of actions that they take (Finkelstein and

Hambrick, 1996). Specifically, TMT international exposure captures the top executives' background in terms of the experiences, knowledge, and relational capital associated with international environments. For example, a top team with members that have greater international exposure will likely have greater knowledge of international markets, larger overseas network ties, and an increased understanding of foreign cultures compared to a TMT without such exposure. As Sambharya (1996) states, international experience is a proxy for the reduction of uncertainty and a surrogate for knowledge of international markets. As such, international experiences contribute to 'organizational learning and build a reservoir of expertise resulting in a global mindset' (p. 741).

### **TMT International Exposure and International Alliance Formation**

International alliances have become a highly important part of firms' strategy in recent years. The benefits of alliances include facilitating quick entry into international markets, gaining access to low cost labour and materials, managing uncertainty, sharing risks and costs, and learning from cross-border partners (Barney, 2002; Inkpen and Beamish, 1997; Osborn and Hagedoorn, 1997). These benefits notwithstanding, many alliances in general are not successful and international alliances in particular have high dissolution rates (Hennart et al., 1998). The factors that contribute to the high failure rates in international alliances include shifting bargaining power (Yan and Gray, 1994), engaging in cheating (Gulati and Singh, 1998), increasing rivalry between partners (Kogut, 1989), creating severe conflict (Ding, 1997), and differing strategic intent of partners (Harrigan and Newman, 1990). Among the many ways to mitigate these negative aspects of international alliances, two of the most important ways are choosing the appropriate partner and establishing a mutually beneficial contract (Arino and Reuer, 2004; Hitt et al., 2000).

Choosing the appropriate partner is one of the most important determinants of success in international alliances since a good partner helps the alliance achieve its goals and is unlikely to opportunistically exploit the alliance (Hitt et al., 2000). Establishing a mutually beneficial contract is equally important because it will reduce the risk of opportunism by both alliance partners resulting in longevity and stability of the alliance (Arino and Reuer, 2004; Gulati and Singh, 1998). Herein, we build on relational capital theory to argue that a top team with greater international exposure can facilitate the formation of international alliances by directly and indirectly influencing the process of alliance partner selection and the contract negotiation.

Scholars have increasingly acknowledged the importance of relational capital for firm value creation (Adler and Kwon, 2002; Nahapiet and Ghoshal, 1998). An important aspect of relational capital is that it is essentially a quality of individuals because it contributes to an individual's human capital (Burt, 1997). Building on previous research, we argue that firms can leverage the knowledge and relational capital of their top executives to implement the firms' strategy.

A TMT with greater international exposure will have a much deeper understanding and knowledge about international environments and will have likely developed a broader external network and relational capital with foreign firms (Bloodgood et al., 1996; Hitt et al., 2002; Roth, 1995). Such attributes of top executive international exposure can provide firms with greater sources of valuable information about potential

partners and have a larger pool of foreign firms for selecting potential partners (Collins and Clark, 2003). Additionally, a TMT with greater international exposure will also be better able to help its firm establish a mutually beneficial contract with its potential partner because a top team with international exposure is better able to convey to operating managers the differences of perspectives that are likely to occur in negotiating international alliance contracts (Arino and Rcuér, 2002; Bleeke and Ernst, 1993).

International alliances are often fraught with many potential conflicts because the partners cannot anticipate and specify all future contingencies in advance (Das and Teng, 1998; Kale et al., 2000). Given that a certain amount of conflicts is expected, TMT international exposure can act to reduce the conflict between the alliance partners. TMT international exposure may provide reputational information to potential foreign partners that the firm has a global mind-set, is more easily to cross-culturally interact with, or is more likely to adequately consider the foreign partners' interests. Such reputational effects may induce the foreign company itself to contact the focal firm. In sum, we argue that TMT international exposure can facilitate the formation of international alliances through its relational capital and reputational effects.

*Hypothesis 1:* TMT international exposure will be positively associated with the formation of international alliances.

### **The Moderating Role of Environmental Uncertainty**

Environmental uncertainty refers to the degree to which firms' external environment is characterized by an absence of pattern, unpredictability, and unexpected change (Dess and Beard, 1984; Keats and Hitt, 1988). A premise of the upper-echelons perspective is that top executives operate under conditions of high uncertainty. Indeed, Hambrick and Mason (1984) suggested that the more uncertain the decision making environment, the more likely that executive characteristics are reflected in strategic choices. Therefore, we argue that the effect of TMT international exposure on the formation of international alliances will be stronger with environmental uncertainty since the flexibility inherent in international alliances will help firms manage uncertain environments. Under conditions of high uncertainty, firms cannot anticipate in advance the particular strategies to pursue. In such settings, retaining flexibility to move quickly into a particular market or industry is critical for firm success. International alliances provide firms with such flexibility (Barney, 2002). Accordingly, while there are many other benefits of international alliances mentioned earlier, we focus on the importance of the flexibility inherent in international alliances in examining the moderating effect of environmental uncertainty for the relationship between TMT international exposure and the formation of international alliances.

Environmental uncertainty requires that firms develop the capability to accurately predict, understand, and flexibly adapt to environmental changes. Firms need to recalibrate their strategies and use different rules of engagement because the changes in uncertain environments are so frequent and rapid (Evans, 1991). In such environments firms may need to ask a 'new set of questions, to draw on new technical and commercial skills and to employ new problem-solving approaches' (Henderson and Clark, 1990, p.

9). Consequently, firms in uncertain environments need to strengthen their capacity to predict and adapt by obtaining information from a variety of sources and preparing a wider range of alternatives that increase flexibility.

International alliances have been argued to increase a firm's strategic flexibility because they allow quick entry into and exit from foreign markets without substantial costs (Kogut, 1991) and provide firms with the option to take a wait-and-see approach (Gomes-Casseres, 1996; Hitt et al., 1998b; Madhavan, 1996). International alliances allow firms to extend or contract the scope of the partnership, switch to other foreign entry modes, or dissolve the partnership depending on the opportunities and threats in foreign markets (Reuer and Leiblein, 2000).

Top executives with international exposure have the necessary capabilities to consider strategic choices that increase firms' flexibility. As mentioned earlier, a top team with greater international exposure possesses greater knowledge, perspectives, experiences, and network ties (Ancona and Galdwell, 1992). This 'requisite variety' enables the TMT to obtain information from a variety of sources that can positively contribute to the accurate assessment of environmental changes (Ashby, 1956). Accordingly, a firm led by a top team with international exposure can be more flexible in decision-making because it can use the abundant knowledge and relational capital of its members to make novel associations and linkages among the various, often contradictory, requirements in uncertain environment (Nutt, 1993; Sharfman and Dean, 1997). Such flexibility of the top team will allow them to consider strategic choices that increase firms' flexibility such as international alliances in order to manage the variety of changes in uncertain environments in a timely way (Barney, 2002).

However, the capability of a top team with international exposure to predict and adapt by selecting flexible strategic choices depends on the discretion afforded to them. As Finkelstein and Hambrick (1996) state, 'In a high discretion situation — one in which the environment and organization confer wide latitude of action — executive characteristics are likely to be reflected in organizational choices. In situations of low discretion — in which there are constraining forces or simply strong convictions about means/ends connections — executive dispositions do not correspond much with strategic choices' (pp. 113—14). Applying this logic to our context, we argue that in environments with more uncertainty, top executives with international exposure will be afforded more discretion to select strategies that can help firms better adapt to the environment. In contrast, in environments with less uncertainty, firms can more easily anticipate environmental changes, which make TMT international exposure less relevant (Finkelstein and Hambrick, 1990). Accordingly, firms led by a TMT with greater international exposure will have more discretion to utilize their capabilities to predict and adapt by pursuing flexible options such as international alliances when the environment is more rather than less uncertain. Accordingly, we suggest that the effect of TMT international exposure on international alliance formation will be more positive as environmental uncertainty increases, leading to the following hypothesis:

*Hypothesis 2:* The level of environmental uncertainty will positively moderate the relationship between TMT international exposure and the formation of international alliances.

## METHODS

### Sample and Data

The sample for this study consists of 263 US firms in 14 industries. The 14 industries were chosen to test the moderating role of environmental uncertainty. We selected 14 industries that have been identified in previous research as either fairly stable or relatively uncertain. For example, the food, furniture, industrial machines, natural gas, petroleum, and steel industries have been characterized by previous research as stable (e.g. Hambrick and Abrahamson, 1995; Lant et al., 1992; Wholey and Brittain, 1989), and the aerospace, computer, motor vehicles, pharmaceutical, semiconductor, surgical and medical, telecommunications equipment, and telecommunications service industries have been described as relatively uncertain (e.g. Zahra et al., 2000).

Having identified a set of industries, we identified all firms in those industries from *Ward's 50,000 Largest Corporations* and COMPUSTAT for our research period (1988-95). Among these we retained only those firms that operated continuously as independent entities for our research period. Specifically, we excluded firms that were subsidiaries, divisions, or joint ventures, as well as firms that were acquired by other companies during the period. Of the remaining firms, we further narrowed the sample to those firms listed in *Dun and Bradstreet's Reference Book of Corporate Management* because our main data on TMT characteristics are obtained from this source. In addition to *Dun and Bradstreet's Reference Book of Corporate Management*, we collected data on TMT characteristics from *Standard and Poors Register of Corporations, Directors, and Executives*, *Who's Who in Finance and Industry*, *Who's Who in America*, company annual reports, and proxy statements. Data on environmental uncertainty and control variables were obtained from COMPUSTAT. Finally, we used only those observations that had complete data at the firm-year level for all variables, resulting in a total of 1875 observations (firm-years).

### Dependent Variable

Since our sample consists of US based firms only, we measure *international alliances* as the number of strategic alliances formed with non-US firms. Our sample consists of firms that have formed alliances as well as those that have not formed alliances during our research period. Our data on international alliances were collected from the *Joint Ventures and Strategic Alliances Database* provided by *Thompson Financial's Securities Data* (TFSD). TFSD is among the most comprehensive and accurate sources of information regarding strategic alliances because the information is obtained from publicly available sources including SEC filings, trade publications, and news and wire sources. Accordingly, previous research has relied on this database (e.g. Kale et al., 2002).

### Independent Variable

We defined the top management team as (1) everyone who has the title above the rank of Vice President (e.g. Chairman, Vice Chairman, Chief Executive Officer, President,

Chief Operating Officer, Chief Financial Officer, Executive Vice President, and Senior Vice President) or (2) a board directorship. This operational definition is consistent with prior studies of top management teams (Michel and Hambrick, 1992).

Most prior studies on the international background characteristics of the TMT have relied on the number of years of international assignments (e.g. Carpenter and Fredrickson, 2001). However, scholars have suggested that a more comprehensive measure should be used to fully capture a TMT's international exposure. For example, Sambharya (1996) measured the international experience of the top management team as the number of years spent abroad on assignments and/or in higher education, or spent in the international division of the firm. The nationality of top team members has also been suggested to be important in shaping how top executives regard organizations and their environments. For example, Black (1997) includes the nationality of the TMT in her measurement of TMT international orientation.

Therefore, we use a comprehensive measure of *TMT international exposure* which includes: (1) the percentage of TMT members educated outside the USA; (2) the percentage of TMT members who had worked abroad in some professional capacity; and (3) the percentage of TMT members born outside the USA. Combining these three captures a TMT's experiences and backgrounds in international environments more completely. After calculating the three measures of international exposure and standardizing them, we summed each of the three measures to form a composite index and then divided it by three. Summing was not a problem because the three measures have the same metric and are highly correlated with one another. To ensure that our measure of TMT international exposure is reliable and valid, we performed two tests. First we validated our measure using factor analysis. The three measures loaded on one factor with a high eigenvalue (i.e. 1.97) and all the factor loadings were above 0.63. Second, the Cronbach alpha was 0.73.

### **Moderating Variable**

Prior literature has discussed and measured the concept of environmental uncertainty. For example, Keats and Hitt (1988) define environmental instability as 'Volatility or difficult-to-measure discontinuities' and use net sales and operating income over a five-year period to measure environmental instability. Dess and Beard (1984) measure environmental uncertainty based on the dispersion above the regression line when net industry sales is regressed on time. More recently, Carpenter and Fredrickson (2001) use a variation of Dess and Beard (1984) to measure environmental uncertainty.

Based on prior works, we measure *environmental uncertainty* in the following way. For each industry, we regress net industry sales on time based on the following regression equation:  $S_t = b_0 + b_1 * t + \epsilon_t$ , where  $S_t$  is the industry sales in year  $t$ , and  $\epsilon_t$  is the residual. Environmental uncertainty is estimated as the standard error of the coefficient divided by average industry sales. The range of environmental uncertainty is between 0.027 and 0.083.

In the case of diversified firms, we measured their environmental uncertainty based on the primary business of the diversified firms. To provide additional support that the

environmental uncertainty in the primary business is representative of the environmental uncertainty of all the businesses in diversified firms, we conducted additional analyses by narrowing our sample to that of single business firms and ran the same analysis. Our analysis suggests almost identical results to those reported in this study.

### Control Variables

Several measures are used as control variables in this study. A frequently examined aspect of TMT composition is TMT diversity (Finkelstein and Hambrick, 1996). While empirical results regarding TMT diversity and organizational outcomes are far from consistent, many studies have shown a positive relationship between TMT diversity and strategic outcomes (Carpenter and Fredrickson, 2001; Tihanyi et al, 2000). Accordingly, we control for the effect of several TMT diversity variables including TMT educational, functional, and tenure diversity. We defined educational and functional experience according to previous research (Carpenter and Fredrickson, 2001; Michel and Hambrick, 1992; Wiersema and Bantel, 1992).<sup>[1]</sup> Since both educational and functional experiences are categorical variables, we develop team level measures of *educational* and *functional* diversity by using a version of the Herfindal—Hirschman index (Bantel and Jackson, 1989; Michel and Hambrick, 1992). This index is calculated as  $H = 1 - \sum S_i^2$ , where  $S_i$  is the proportion of the TMT in the  $i$ -th category,  $H$  will vary between 0 and 1, where values close to 1 indicate higher diversity among the TMT and values close to 0 indicate that the TMT is dominated by one type. *Tenure diversity* was calculated using the coefficient of variation (standard deviation divided by the mean). The tenure for each member of the TMT was calculated by subtracting the year the top executive joined the TMT from the current year. The coefficient of variation is preferable when using data that involve time (Allison, 1978). Carpenter et al. (2004) stated that it is imperative to control for the size of the TMT when studying the effects of TMT composition on organizational outcomes. *TMT size* is measured as the total number of executives on the TMT.

Research suggests that firm size can have an impact on various organizational outcomes (Finkelstein and Hambrick, 1996; Wiersema and Bantel, 1992). *Firm size* is measured as the natural log of firm assets. Firm age can also have an impact on international alliances. *Firm age* is measured by subtracting the year of incorporation from the current year. The amount of cashflow and R&D intensity can have effects on a firm's formation of international alliances. *Cashflow* is measured as cashflow divided by sales (Madhavan, 1996). *R&D intensity* is measured as R&D expense divided by the total number of employees (Hitt et al., 1997). Firm performance can influence a firm's rate of international alliance formation. We measure *firm performance* using the return on assets. The level of diversification has been associated with organizational outcomes (Hoskisson et al., 1993). To measure *firm diversification*, we used Palepu's (1985) entropy measure defined as  $EP_{ia} \ln(1/P_{ia})$ , where  $P_{ia}$  is the proportion of firm  $a$ 's sales in business segment  $i$ . Total diversification score of zero indicates a single business, while scores greater than zero indicate higher levels of diversification. A firm with a greater number of alliances will likely form more international alliances. Accordingly, we control for the effect of a firm's *total number of alliances*. Finally, we conducted our analyses with and without industry

dummy variables (Dess et al., 1990). Because both results were identical, we chose to present the results without industry effects in this study.

### Analysis

The database for this study is a panel data set. Scholars in management have encouraged the use of panel samples because they control for unobserved heterogeneity and capture both average effects across individual units and dynamic effects across the entire samples (Hitt et al., 1998a; Kmenta, 1986). It has been suggested that the method of Generalized Least Squares (GLS) is the most appropriate to test panel database because it can overcome the problem of cross-sectional heteroskedasticity and within-unit serial correlation (Dielman, 1980). Thus, consistent with prior research on upper-echelons, we use GLS to test our hypotheses (Finkelstein and Hambrick, 1990).

We developed the following regression model to test our hypotheses:

$$Y_{i,t+1} = \alpha + \beta_1 X_{it} + \beta_2 EU_{it} + \beta_3 X_{it} * EU_{it} + \sum \gamma_j Z_{ijt} + v_i + \varepsilon_{it}$$

where  $Y_{i,t+1}$  is international alliance formed by firm  $i$  in year  $t+1$ ,  $X_{it}$  is the firm's TMT international exposure in year  $t$ ,  $EU_{it}$  represents the environmental uncertainty of industry  $k$  to which firm  $i$  belongs,  $Z_{ijt}$  is control variable  $j$ ,  $v_i$  is the firm-specific residual, and  $\varepsilon_{it}$  is a standard residual (mean zero, homoskedastic, uncorrelated with itself,  $v_i$  and independent variables). The regression model could be analysed by the fixed-effects or the random-effects model. A fixed-effects model assumes that the firm-specific residual has a variance of zero, whereas a random-effects model assumes that the firm-specific residual has a distribution with a variance of  $\sigma_v^2$ . Due to the different assumptions, results generated from the fixed-effects model cannot be extrapolated to a time period outside the sample period, while those from the random-effects model can be generalized to a longer time span (Li and Greenwood, 2004). Additionally, the Hausman specification test confirmed no significant differences between the two models. Hence, we report the results from the random-effects model in this paper.

To ensure the causality relationship between variables, we incorporate temporal precedence by using a lag structure (Finkelstein and Hambrick, 1996). The international alliances of the firm were measured at year  $t+1$  and the remaining variables were measured at year  $t$ . This ensures that the direction of causality is from TMT international exposure to international alliances and not the reverse. The analysis is performed in *STATA* using the program's *xt* family of commands, which are specifically designed to handle panel database.

## RESULTS

Table I contains the descriptive statistics along with the correlation matrix for all the variables included in this study. The raw values for all variables are presented in Table I although standardized values are used in the hypotheses tests. In addition, all variables are checked for normality and those that departed from it are transformed using a

Table I. Descriptive statistics and correlations

Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. International alliances	0.82	2.34													
2. TMT international exposure	0.07	0.11	0.06***												
3. Environmental uncertainty	0.04	0.01	-0.00	-0.06**											
4. TMT educational diversity	0.71	0.22	0.08***	-0.01	0.08***										
5. TMT functional diversity	0.72	0.16	0.12***	-0.03**	0.04*	0.45***									
6. TMT group tenure diversity	0.95	0.42	0.03	0.09***	0.02	0.10***	0.10***								
7. TMT size	5.25	2.69	0.34***	0.07**	-0.13***	0.34***	0.43***	0.11***							
8. R&D intensity	8.14	10.06	0.18***	0.06**	-0.07***	0.12***	0.14***	-0.02	0.14***						
9. Cash flow	0.68	0.09	0.13***	-0.00	-0.04*	0.08***	0.14***	-0.05*	0.19***	0.14***					
10. Firm size	6.44	2.26	0.43***	0.08***	-0.12***	0.14***	0.31***	0.00	0.57***	0.10***	0.34***				
11. Firm age	55.68	34.46	0.11***	0.10***	-0.19***	-0.13***	0.02	0.00	0.20***	-0.20***	0.08***	0.49***			
12. Firm diversification	0.21	0.38	0.07**	-0.02	-0.09***	-0.06**	0.07***	0.01	0.10***	-0.14***	0.02	0.28***	0.26***		
13. Firm performance	0.02	0.12	0.04†	-0.09***	-0.13***	0.02	0.13***	-0.05*	0.14***	0.09	0.27***	0.27***	0.16***	0.08***	
14. Total number of alliances	2.20	7.12	0.90***	0.04†	-0.00	0.08***	0.10***	0.04†	0.32***	0.23***	0.13***	0.37***	0.07**	0.00	0.03

Notes:

†  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

Means and standard deviations are unstandardized values.

Box—Cox transformation. To check for multicollinearity, we calculate the variation inflation factors (VIF) and they are within acceptable ranges. The VIFs for all the variables were substantially lower than the recommended cut-off of 10 suggested in prior research (Neter et al., 1996). These results suggest that multicollinearity is not a serious problem.

We now turn to the results of formal hypotheses tests. Table II presents the GLS regression results for both main and moderated effects. Model 1 is a baseline model

Table II. Results of GLS regression analysis (dependent variable: international alliances)

Variables	Model 1	Model 2	Model 3	Model 4
TMT international exposure		0.033* (0.016)	0.033* (0.016)	0.048** (0.017)
Environmental uncertainty			-0.000 (0.020)	-0.010 (0.021)
TMT international exposure* Environmental uncertainty				0.051* (0.020)
TMT educational diversity	0.011 (0.015)	0.011 (0.015)	0.011 (0.015)	0.007 (0.015)
TMT functional diversity	0.013 (0.016)	0.016 (0.016)	0.016 (0.016)	0.021 (0.016)
TMT group tenure diversity	-0.008 (0.011)	-0.009 (0.011)	-0.009 (0.011)	-0.008 (0.011)
TMT size	-0.038* (0.016)	-0.040* (0.016)	-0.040* (0.016)	-0.040* (0.016)
R&D intensity	-0.034* (0.013)	-0.036** (0.013)	-0.036** (0.013)	-0.035** (0.013)
Cash flow	-0.010 (0.017)	-0.009 (0.017)	-0.009 (0.017)	-0.004 (0.017)
Firm size	0.128*** (0.022)	0.125*** (0.022)	0.125*** (0.022)	0.121*** (0.022)
Firm age	-0.016 (0.019)	-0.019 (0.019)	0.044** (0.016)	0.044** (0.016)
Firm diversification	0.042** (0.016)	0.044** (0.016)	-0.019 (0.019)	-0.020 (0.019)
Firm performance	-0.011 (0.010)	-0.009 (0.010)	-0.009 (0.010)	-0.007 (0.010)
Total number of alliances	0.907*** (0.012)	0.907*** (0.012)	0.907*** (0.012)	0.908*** (0.012)
Constant	0.012 (0.016)	0.011 (0.016)	0.011 (0.016)	0.012 (0.016)
$\sigma_u$	0.217	0.217	0.217	0.216
$\sigma_e$	0.368	0.368	0.368	0.368
$\rho$	0.257	0.258	0.258	0.256
Wald chi-square	5953.45	5958.57	5952.23	5990.36

Notes:

Numbers are standardized regression coefficients.

Numbers in parentheses are standard errors.

†  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

consisting of control variables only. Model 2 adds the variables of interest to test the main effects. In Hypothesis 1, we argue that TMT international exposure is positively related to the formation of international alliances. Model 2 displays that TMT international exposure is statistically significant and positive (0.033,  $p < 0.05$ ). This result provides support for Hypothesis 1.

In Hypothesis 2, we predict that environmental uncertainty moderates the relationship between TMT international exposure and international alliance formation. To test this hypothesis, we add to Model 3 a multiplicative interaction term between the TMT international exposure variable and environmental uncertainty. The results are shown in Model 4. We find support for the moderating effect of environmental uncertainty for the relationship between TMT international exposure and international alliances. Specifically, we find the interaction between TMT international exposure and environmental uncertainty is significant and positive (0.051,  $p < 0.05$ ), supporting Hypothesis 2.

To determine support for the direction of the hypothesized relationships, we divide our sample into two groups based on the degree of environmental uncertainty. Using the mean value of environmental uncertainty, we define dynamic industries ( $N = 914$ ) as those with values above the mean and stable industries ( $N = 961$ ) as those below the mean. We retest Hypothesis 1 for each industry group and present the results in Table III. Models 1 and 2 show the effects of TMT international exposure on international alliances for dynamic industries whereas Models 3 and 4 represent the corresponding results for stable industries. For dynamic industries, TMT international exposure is positive ( $p < 0.01$ ). In contrast, for stable industries, TMT international exposure is not significant. This result leads to strong support for Hypothesis 2, because the hypothesized relationship between TMT international exposure and international alliance formation is stronger in dynamic industries than in stable ones. We discuss the implications of these findings in the next section.

To further substantiate the evidence in Table III, we relied on the procedure reported in Jaccard et al. (1990). First, for each of the two industries (i.e. stable and dynamic), we divided our sample into two groups in terms of the TMT international exposure variable (i.e. lower mean and higher mean groups). Second, for each group, we calculated the mean values for the lower and higher mean groups, respectively. Finally, we used the results in Models 2 and 4 of Table III to develop plots for international alliance formation. As shown in Figure 1, the relationship between TMT international exposure and international alliance formation is positive in dynamic industries, whereas such a relationship remains unchanged in stable industries. Accordingly, the interaction graph presented in Figure 1 provides further support for Hypothesis 2.

## DISCUSSION

This study examined the effects of TMT international exposure on firms' formation of international alliances. Drawing on relational capital theory, we argued that firms led by top teams with greater international exposure would lead to a greater number of international alliance formation. Additionally, relying on the upper-echelons perspective that the more uncertain the decision making environment, the more likely that executive characteristics are reflected in strategic choices, we argued that the impact of TMT

Table III. Results for GLS regression analysis in dynamic and stable industries (dependent variable: international alliances)

Variables	Dynamic industries (N = 914)		Stable industries (N = 961)	
	Model 1	Model 2	Model 3	Model 4
TMT international exposure		0.066** (0.020)		-0.010 (0.019)
TMT educational diversity	0.008 (0.018)	0.001 (0.018)	0.005 (0.019)	0.004 (0.019)
TMT functional diversity	0.006 (0.021)	0.022 (0.021)	0.006 (0.020)	0.006 (0.020)
TMT group tenure diversity	-0.007 (0.014)	-0.007 (0.014)	0.002 (0.014)	0.003 (0.014)
TMT size	-0.072*** (0.019)	-0.076*** (0.019)	-0.021 (0.020)	-0.020 (0.020)
R&D intensity	-0.23 (0.017)	-0.023 (0.017)	-0.072*** (0.015)	-0.71*** (0.015)
Cash flow	-0.023 (0.031)	-0.012 (0.031)	-0.036 (0.017)	-0.035 (0.017)
Firm size	0.142*** (0.025)	0.133*** (0.024)	0.094*** (0.025)	0.094*** (0.025)
Firm age	-0.025 (0.021)	-0.029 (0.021)	-0.044* (0.021)	-0.044* (0.021)
Firm diversification	0.038† (0.019)	0.041* (0.019)	0.026 (0.021)	0.026 (0.021)
Firm performance	-0.004 (0.014)	0.001 (0.014)	-0.010 (0.013)	-0.010 (0.013)
Total number of alliances	0.920*** (0.016)	0.922*** (0.016)	0.922*** (0.015)	0.922*** (0.015)
Constant	0.010 (0.019)	0.009 (0.019)	0.012 (0.017)	0.012 (0.017)
$\sigma_u$	0.154	0.150	0.130	0.131
$\sigma_e$	0.346	0.345	0.367	0.367
$\rho$	0.166	0.160	0.111	0.112
Wald chi-square	4111.80	4215.22	4298.74	4287.34

## Notes:

Numbers are standardized regression coefficients.

Numbers in parentheses are standard errors.

†  $p < 0.10$ , \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

international exposure on the formation of international alliances would be more positive as the level of environmental uncertainty increases. Taken together, the results of our study suggest support for our arguments.

Specifically, we suggested that top teams with greater international exposure would have developed important relational capital with foreign firms. Such relational capital is crucial not only in influencing the selection of alliance partners but also in helping in the contract negotiation process. Accordingly, a top team with greater international exposure can 'push' to gain more international alliances by utilizing their capabilities accom-

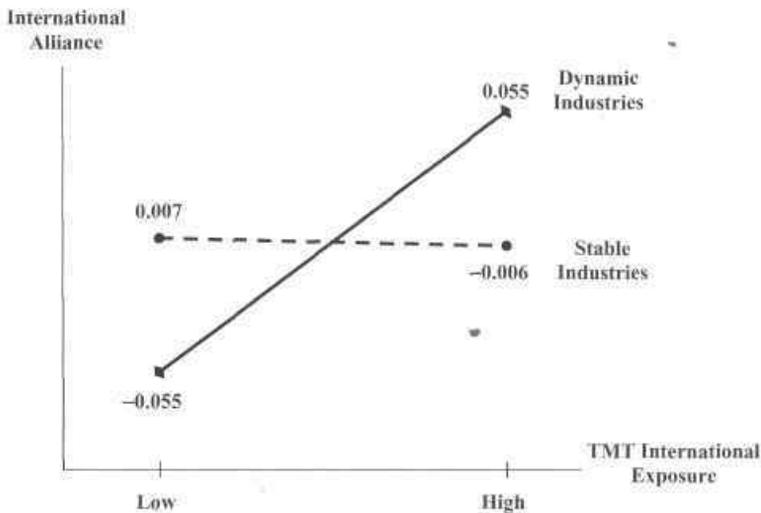


Figure 1. The moderating effect of environmental uncertainty

panying international exposure. Moreover, the international alliance formation process does not always have to be initiated by the US firm. Rather, top teams with greater international exposure are more likely to provide information to potential foreign firms that they have a global mind-set, are amenable to cross-culturally interact, and are likely to consider the foreign partners' interests. Consequently, the international alliance formation may be 'pulled' by potential foreign partners. As initial support for our arguments, TMT international exposure showed a positive and significant relationship with the formation of international alliances. Therefore, our study provides some preliminary evidence for the importance of the reputational effects of top executives in the formation of international alliances.

Additionally, we argued that a top team with greater international exposure will be more valuable for firms in forming international alliances in dynamic as opposed to stable environments. As we noted earlier, top teams with greater international exposure possess greater knowledge, perspectives, and network ties which enhance the flexibility of their decision making (Nutt, 1993; Sharfman and Dean, 1997). Such capabilities allow the top team to see and consider flexible strategies such as international alliances to proact and adapt quickly to uncertain environments. Moreover, uncertain environments provide top teams with the greater discretion to facilitate the formation of international alliances. We found that the relationship between TMT international exposure and the formation of international alliances becomes more positive with increases in environmental uncertainty, providing support for our arguments. However, when we divided our sample into dynamic and stable groups (as noted earlier), we found that the positive relationship between TMT international exposure and the formation of international alliances does not hold for all environments. Specifically, we found that the relationship between TMT international exposure and international alliances is positive in dynamic industries whereas nonexistent in stable ones. Such findings suggest that firms operating in dynamic industries need flexible options that international alliances provide to adapt

quickly to the environment. In uncertain environments, top teams with international exposure will not only have the necessary capabilities to see the value of international alliances but also have the discretion to implement international alliances. However, top executives that operate under stable environments may not have the necessary discretion and/or see the value of International alliances.

### **Contributions**

The findings of the present study suggest several important contributions for research and practice. First, recent studies have examined the antecedents to international alliances. For example, Reuer and Ragozzino (2006) investigated such firm level factors as inside ownership, financial leverage, multinationality, and acquisitions that can impact international alliance formation. While their study is important, they did not examine TMT characteristics as a possible antecedent to international alliance formation. In comparison, our study complements that of Reuer and Ragozzino (2006) by focusing on the capabilities and reputational effects of TMTs on international alliance formation.

Second, this study extends recent research on the importance of the international backgrounds of top executives (Carpenter et al, 2001, 2003; Daily et al, 2000) by developing theory and evidence for the effect of TMT international exposure on the formation of international alliances. In a recent study, Levy (2005) examined the effects of top executives' attention patterns on firms' global strategic posture. She found that firms were more likely to develop a more comprehensive global strategic posture when their top executives paid attention to the external rather than the internal environment. Our findings complement those of Levy's in that there may be a positive relationship between top executives' international exposure and their attention patterns.

Third, our findings highlight the importance of context in explaining the effect of TMT international exposure on international alliance formation. Because international alliances provide firms with flexible options and these are more important in uncertain environments, a TMT with greater international exposure has the capability to see the value of engaging in international alliances and the discretion to implement such strategies in dynamic environments. On the other hand, firms in stable environments encounter few environmental changes and those changes are readily predictable. Accordingly, in such environments, firms led by top executives with international exposure may not see the need for international alliances that provide flexible options. Additionally, these teams may not be afforded the discretion needed to implement international alliances. Therefore, increases in TMT international exposure may not increase the formation of international alliances in stable environments.

### **Limitations and Future Research Directions**

Although care was taken to achieve rigour, this study has several limitations. One limitation of this study pertains to the sample used. More specifically, the sample for this study consists of US firms only. Because of the sample limitation, the generalizability of the findings of this study to non-US companies is questionable and begs the question whether our findings hold for firms headquartered outside the United States. For

example, the international exposure of the top team among Asian or European firms may be vastly different from that of US firms. Thus, a direction for future research would be to test the hypotheses in this study using non-US firms.

Second, while our measure of TMT international exposure is more comprehensive than that of previous studies, we acknowledge that the differences among top team members' international exposure must be considered in future research. For example, it may be important to address whether international exposure per se is valuable or whether the quality of international exposure is more important (e.g. top executives' work experience in reputable organizations or education in prestigious schools). While this is an important research question to address, we were unable to examine this issue empirically because of data limitations. Hence, the quality of TMT international exposure should be addressed in future research.

Third, with regard to international alliances, we acknowledge that there are many different characteristics of international alliances including level of ownership, scope of cooperation, and degree of cultural dissimilarity between partners. When aggregating all of these different types of alliances, ideally we should incorporate the many different facets of each of the alliances. While this issue is important, we regret that we cannot address this issue in this study because of data limitations. Future research examining TMT international exposure on international alliances at the alliance level should attempt to incorporate such different aspects of international alliances. However, we can aggregate all the international alliances in addressing the research questions in this study because our research questions concern the relationship between TMT international exposure and the number of international alliance formation.

Finally, this research has addressed the importance of context by incorporating the moderating role of the environment for the relationship between TMT international exposure and international alliances. However, future research should work to address other contexts that may have important implications for these relationships. For example, a fruitful avenue for future research would be to explore social contexts and try to capture the process that top teams go through when deciding on whether to form international alliances. One possible argument might be that the association between TMT international exposure and international alliances may be more pronounced when the top team is more behaviourally integrated (Hambrick, 1994). By incorporating other types of contexts, we will be able to capture the enactment process that takes place in the organization as top teams contemplate various kinds of strategies including, the formation of international alliances.

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## NOTE

- [1] Educational experience is defined as the executives' academic majors in their highest level of education. We use five educational specializations including arts, sciences, engineering, business and economics,

and law to categorize each TMT member's educational experience. TMT functional experience is defined as the area in which the TMT member had the most experience, as measured by the number of years spent in that area. We categorize functional experience into the following eight functional tracks: (1) production operations; (2) R&D and engineering; (3) accounting and finance; (4) management and administration; (5) marketing and sales; (6) law; (7) personnel and labour relations; (8) others.

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