

The impact of the top management teams' knowledge and experience on strategic decisions and performance

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Abstract

This paper explores whether top management teams' (TMTs) knowledge and experience are significant predictors of a firm's strategic decisions and organization outcomes. The existing research throws little light on how firms with limited resources embedded in TMTs, particularly in emerging markets, innovate and achieve success in foreign countries. We focus on the impact of TMTs' functional background heterogeneity and international experience on innovation and internationalization, as well as examine the relationship between innovation, internationalization and performance. The proposed relationships are empirically investigated in a sample of Taiwanese-listed companies operating in the electronics industry. The results demonstrate a positive association between a TMT's functional background heterogeneity and a firm's innovation. Moreover, a TMT's international experience relates positively to a firm's innovation and internationalization, therefore firms with a higher level of innovation achieve a higher level of internationalization.

Keywords: top management team, functional background heterogeneity, international experience, innovation, internationalization

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INTRODUCTION

Firms from emerging markets are often latecomers to the global market, and their limited resources make it difficult to compete with entrenched rivals (Luo & Tung, 2007). Top management teams' (TMT) experience and knowledge create vital managerial and strategic resources and capabilities for all firms. These capabilities play a critical role in these firms' allocation of resources, impacting in turn the firms' rates of growth (Athanassiou & Nigh, 1999; Hutzschenreuter & Horstkotte, 2013). The upper echelons theory proposes that the demographic characteristics of a firm's top executives are associated with strategic choices and performance (Hambrick & Mason, 1984). The executives' demographic backgrounds shape their perception, cognitive value and preferences, which informs the TMTs' knowledge and skills. The success or failure of a firm entering a foreign market depends on the TMTs' knowledge, experience and ability to identify market opportunities (Sambharya, 1996; Carpenter & Fredrickson, 2001).

TMTs influence important strategic decisions relating to activities such as innovation investments, diversification, strategic alliance formation and internationalization—each of which will have important impacts on performance (Bantel & Jackson, 1989; Tihanyi, Ellstrand, Daily, & Dalton, 2000;

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Carpenter & Fredrickson, 2001; Cabrera-Suárez & Martín-Santana, 2013; Wang, 2015; Xie, Wang, & Qi, 2015). Prior studies have focused more on evaluating the effect of TMTs on innovation and internationalization in the context of developed countries (e.g., Finkelstein & Hambrick, 1990; Wiersema & Bantel, 1992; Hambrick, Cho, & Chen, 1996; Tihanyi et al., 2000; Carpenter & Fredrickson, 2001; Herrmann & Datta, 2005). Scholars have argued that the literature on the role of TMTs in the strategic decisions of firms from emerging countries remains underdeveloped (Carpenter & Fredrickson, 2001; Lee & Park, 2006; Barkema & Shvyrkov, 2007). These findings of firms from developed markets may not be relevant to firms from emerging markets, since such firms are often in the early stage of internationalization. Compared with large firms from developed countries, firms from emerging markets frequently cope with limited resources and low levels of innovation.

The difference in composition and assumption between TMTs from emerging countries and those from developed countries reveals a need to study the influence of TMTs on strategic decisions, concentrating on firms from emerging markets. First, TMTs in developed countries benefit from greater diversity in terms of ethnicity, nationality and gender than firms from emerging markets (Heijltjes, Olie, & Glunka, 2003). The decision-making process in firms from emerging markets tends to exhibit characteristics of high-power distance and uncertainty avoidance (Hofstede, 1980; Carpenter & Fredrickson, 2001). We argue that the benefit of the TMTs heterogeneity on multiple perspectives and information processing will be more apparent under a Chinese context, which typically emphasizes group orientation and interpersonal harmony (e.g., Tjosvold, Poon, & Yu, 2005). Qian, Cao, and Takeuchi (2013) also demonstrate that the development of *guanxi* and interpersonal relationships are prized in a Chinese society. TMTs with a diverse background value harmony, which leads to less aggressive debate and interpersonal conflict in the strategic decision-making process. A significant association between TMT diversity and conflict should not be assumed under a Chinese context. Instead, TMTs are likely to provide multiple perspectives and viewpoints in a harmonious decision-making process. Firms in emerging markets typically have limited managerial, human and financial resources, therefore a TMT's knowledge and experience is crucial for innovation and internationalization (Tan & Meyer, 2010). Their managerial experience guides the firms' allocation of resources and influences the firms' rate of growth in emerging markets (Luo & Tung, 2007).

The existing research throws little light on how firms from emerging markets can innovative and achieve success in the global market despite the limited resources embedded in TMTs. Taking the perspective of firms from emerging markets, we explore how the TMT's knowledge and experience affect strategic decisions related to innovation and internationalization. Moreover, this study investigates the association between innovation and internationalization in order to evaluate how these two factors affect a firm's performance. In this study, we highlight those two strategic decisions because we focus on the Taiwanese electronics industry. Previous literature found that these firms operate in relatively short technology and product cycles; therefore they are forced to carve out market share quickly in order to survive in a highly competitive industry. They also enhance their innovative capabilities and improve their competitive position through entering global markets (Mitchell, Shaver, & Yeung, 1992). Internationalization provides firms with opportunities to gain technological knowledge and achieve sales growth (Autio, Sapienza, & Almeida, 2000; Zahra, Ireland, & Hitt, 2000). Since firms from emerging markets, such as Taiwanese companies, are latecomers in the global market and have to compete with large firms from developed countries, investment in research and development (R&D) and tapping into foreign markets is a critical strategy to exploit new business opportunities (Leonidou & Katsikeas, 1996; Coviello & Munro, 1997), and this is especially true for high-technology firms (Autio, Sapienza, & Almeida, 2000; Santos, Doz, & Williamson, 2004). Recognizing that the efficient allocation of resources is required to ensure effective internationalization and innovation (Kor & Mahoney, 2005), we concentrate on how TMT experience and knowledge affect internationalization and innovation.

This study contributes to a better understanding of how TMTs' experience and knowledge influences strategic decisions in emerging markets, building on the empirical findings of prior studies that dealt with the role of TMTs in strategic decisions in firms from developed countries. This expands our comprehension of how such firms, despite possessing fewer resources and capabilities, are able to successfully innovate and internationalize.

The paper is structured as follows. In the next section, we review the extant research related to the association between the TMTs' characteristics and strategic decision making. We then formulate our hypotheses. The method and empirical findings are described in the third and the fourth section, respectively. We discuss the results in the fifth section and provide a conclusion in the final section.

RESEARCH BACKGROUND AND HYPOTHESES

Previous studies stated a variety of perspectives to explain the influence of managers' knowledge and experience on a firm's strategic decisions. Several studies applied prospect theory to propose that decision makers tend to be risk-averse in a domain of gains (Kahneman & Tversky, 1979). Managers with a long tenure are generally more knowledgeable about the firms' prospects (Kor, 2006). This long experience, however, may also indicate that decision makers are more likely to be risk-averse because they are psychologically and tangibly invested in the firm (Simsek, 2007). Long-tenured managers are more likely to commit themselves to the *status quo* and have a lower willingness to embrace strategic change (Cyert & March, 1963; Hambrick & Fukutomi, 1991). In addition, Simon (1957) also proposed bounded rationality to refer to the concept that the managers make satisficing choices rather than pursuing optimizing strategies due to limited information, time and intellectual abilities. For the research, we apply the upper echelons theory developed by Hambrick and Mason (1984) to explain that the executives' experience represents their cognition, values, skills and knowledge base, which affects the firms' strategic choices. The organizational outcomes of strategies and effectiveness reflect the values and cognitive bases of the executives in the organization (Hambrick & Mason, 1984; Carpenter, Geletkanycz, & Sanders, 2004). The individual characteristics of the top managers determine their perception of the environment, and this perception informs their strategic decisions. We also employ this theory to explain how the functional experience and international experience of the TMTs influences innovation and internationalization and performance.

According to the upper echelons theory established by Hambrick and Mason (1984), the TMTs' characteristics, previous experience and psychological beliefs influence the firms' behaviors and strategic decisions (Kor & Mahoney, 2005). A TMT's demographic heterogeneity, such as age, gender, tenure, functional background and educational background, represents its awareness, preferences, experiences and skills, which benefit innovative thinking and strategic outcome (e.g., Wiersema & Bantel, 1992; Hambrick, Cho, & Chen, 1996; Tihanyi et al., 2000; Carpenter & Fredrickson, 2001). Research demonstrates that diverse cognitive perspectives are rooted in distinct knowledge and experience, which, in turn, promote constructive debate and strategic innovation (e.g., Hambrick & Mason 1984; Tihanyi et al. 2000; Xie, Wang, & Qi, 2015). Access to a diversity of information sources provides heterogeneous TMTs with the broad range of options required to resolve complicated problems (Certo, Lester, Dalton, & Dalton, 2006).

Another research line, resource-based theory, stresses that a firm with resources that are valuable, scarce, inimitable and nonsubstitutable can outperform other firms (Barney, 1991). TMTs' backgrounds and experience, such as international experience and network relationships, represent the firm's scarce, inimitable and nonsubstitutable resources (Athanasios & Nigh, 2000; Castanias & Helfat, 1991, 2001). Such knowledge is critical to the firm because the TMT's decisions impact resource allocation and deployment (Kor & Mahoney, 2005) and influence the firm's strategic choices (Athanasios & Nigh, 1999). Furthermore, the nonsubstitutable experience and knowledge of the

TMTs enable them to recognize market opportunities. Therefore, the specific resources embedded in TMTs affect the firms' investments and how effectively these strategic investments are managed (Kor & Mahoney, 2005). As a result, the superior allocation of resources is a critical competitive advantage for firms.

TMT's functional background heterogeneity

Functional background heterogeneity refers to the accumulated knowledge and skills by executives from prior work experiences (Ancona & Caldwell, 1992). Diverse functional backgrounds enhance the managers' task-related knowledge and awareness of market trends, as well as affect the way problems are defined, information is processed and strategic choices are made. Since innovative decisions are actualized based on the manager's ability, knowledge and experience, innovation is more likely to occur when people of diverse disciplines, backgrounds and areas of expertise share ideas (Walsh, 1988). Diversified and multiple sources of information benefit the process of solving complex problems (Milliken & Martins, 1996; Certo et al., 2006). The multiple perspectives and knowledge of TMTs tend to produce a variety of opinions and interpretations when assessing alternatives, thereby facilitating creativity and innovative decision making (Auh & Menguc, 2005; Boone & Hendriks, 2009). Studies have indicated that TMTs with a variety of characteristics tend to receive information from a wide range of sources and are more likely to propose innovative ideas (Bantel & Jackson, 1989; Wiersema & Bantel, 1992). However, the other stream argues that the diverse values and backgrounds may cause conflicts which will hinder information-sharing (O'Reilly, Snyder, & Boothe, 1993; Smith, Smith, Olian, Sims, O'Bannon, & Scully, 1994; Jehn, Northcraft, & Neale, 1999).

Adopting the positive side, this study demonstrates that diversity will fuel innovation due to the benefit of multiple information sources and perspectives from heterogeneity. We argue that the positive effect will be more obvious under a Chinese context, which typically emphasizes interpersonal harmony (Tjosvold, Poon, & Yu, 2005). Qian, Cao and Takeuchi (2013) also state that in a Chinese context, society cares more about the development of *guanxi* and interpersonal relationships. In this paper, we propose that, under a Chinese context, TMTs tend to provide multiple perspectives and viewpoints in a harmonious decision-making process and avoid aggressive forms of debate and interpersonal conflict in the strategic decision-making process. Thus, diversity contributes to innovation instead of damaging creativity.

TMTs that draw experience from the members' different functional backgrounds are more open to innovative ideas and novel strategies, which is the foundation of innovative solutions. A diversity of information predicates high levels of creativity (Williams & O'Reilly, 1998). Moreover, when TMTs have a diverse background, it stimulates debate and improves judgment. This situation is particularly relevant to the application of creative ideas to solve complex problems during the innovative process (Hambrick & Mason, 1984; Simons, Pelled, & Smith, 1999).

Since innovation entails environmental change, a heterogeneous TMT enables a firm to approach problems from various perspectives in a way that reduces uncertainty (Herrmann & Datta, 2005). A TMT with a diverse functional background will have a higher tolerance toward risk during environmental change, and is more willing to invest in innovation (Bantel & Jackson, 1989; Camelo-Ordaz, Hernández-Lara, & Valle-Cabrera, 2005).

TMTs that have heterogeneous functional backgrounds can contribute to their firms' knowledge base while fostering the ability to identify risk and opportunities inherent in environmental change (Jackson, 1992). Bantel and Jackson (1989) studied the banking industry and found that TMTs with more heterogeneous functional backgrounds bring greater administrative innovation. Recognizing a relationship between functional background and TMT openness, we proposed that greater functional

background heterogeneity would result in a TMT that emphasizes innovative strategic decisions. Thus

Hypothesis 1a: A TMT's functional background heterogeneity will be positively associated with the firm's level of innovation.

Functional background heterogeneity also affects the firms' internationalization process. Firms entering a foreign market typically face high uncertainty, ambiguity and substantial environmental change (Herrmann & Datta, 2005). Studies have demonstrated that the functional background diversity of TMTs strengthens the ability of firms to deal with the environmental complexities within internationalization (Tihanyi et al., 2000; Carpenter & Fredrickson, 2001; Herrmann & Datta, 2005; Rivas, 2012).

Research suggests that the executives' prior experience provides firms with positional advantages that may be leveraged to grow operations (Sapienza, Autio, George, & Zahra, 2006; Boone & Hendriks, 2009). Furthermore, executives provide advice for firms dealing with complex decisions arising from internationalization (Athanassiou & Nigh, 1999).

The TMTs' valuable external networks contain local connections and social capital that improve access to foreign markets (Hitt, Bierman, Shimizu, & Kochhar, 2001). Experience that spans various functional backgrounds helps firms to identify critical external factors, and then integrate a diversity of resources and skills that enable them to evaluate and make effective international investment decisions. During the internationalization process, TMTs with more heterogeneous functional backgrounds are especially capable of observing opportunities and threats in foreign markets, and then responding flexibly to such environmental uncertainties. Thus

Hypothesis 1b: A TMT's functional background heterogeneity will be positively associated with the firm's level of internationalization.

TMT's international experience

The behavior and characteristics of TMTs are primary determinants of success in the global environment. International experience acquired while studying or working abroad shapes the executives' perceptions, cognition and personalities (Herrmann & Datta, 2005). Top managers with international experience are more likely to possess the vision required to develop innovative products than managers with less international experience. Studies have also suggested that international experience is a crucial determinant of executives' strategic visions, which are related to the companies' innovation (Camelo-Ordaz, Fernández-Alles, & Valle-Cabrera, 2008).

Innovation requires long-term, rather than short-term strategic investment. Global mind-set training provides executives with a high tolerance for environmental uncertainty (Carpenter & Fredrickson, 2001). TMTs with a global mind-set are particularly sensitive to environmental change and market opportunities, and possess the flexibility required to develop innovative ideas. This implies that a higher tolerance of market risk drives executives to aggressively devote resources to innovative activities. International experience also brings a broader range of information from external networks, enabling executives to rapidly become familiar with changing environments. In summary, the TMTs' international experience helps firms to assess innovative sources and build innovative capabilities. Thus

Hypothesis 2a: A TMT's international experience will be positively associated with the firm's level of innovation.

The international experience and knowledge gained from prior studies or work experience gives the executives a more global view and cultivates an open attitude (Sambharya, 1996). In addition,

a TMT's knowledge of the international environment helps it to perceive lower risk while evaluating international investments (Carpenter & Fredrickson, 2001). Firms that enter foreign markets are confronted with a different economic, cultural and institutional environment where the acquisition of foreign knowledge is required to succeed. This understanding of other cultures, regulations and market risk helps TMTs surmount the obstacles of operating in foreign markets.

When entering foreign markets, firms face complexity and a highly competitive environment. International experience increases the managers' ability to exploit organizational capabilities and deploy resources efficiently to succeed in foreign markets (Tihanyi et al., 2000; Carpenter & Fredrickson, 2001). The accumulation of international experience can also reduce the time required to become familiar with a foreign market.

Individuals that study or work abroad create a network of foreign partners, which provides firms with windows into new markets, as well as greater opportunities to cooperate with foreign firms (Bloodgood, Sapienza, & Almeida, 1996; Hitt, Lee, & Yucel, 2002). Such experience also facilitates access to potential foreign suppliers and customers. International cooperation enables firms to access local resources and local market information in a way that facilitates a firm's entry into foreign markets (Carpenter & Fredrickson, 2001). Thus, firms have a higher level of internationalization when the TMTs have more international experience:

Hypothesis 2b: A TMT's international experience will be positively associated with the firm's level of internationalization.

Innovation and internationalization

In previous research, scholars have raised a number of arguments about the relationship between innovation and internationalization. Some have advocated that innovation can create a monopoly for firms, enabling them to leverage this competitive advantage in other countries (Teece, 1980). Others have advocated that international expansion produces opportunities for multinational companies to gain new resources and knowledge in new markets (Kotabe, 1990; Hitt, Hoskisson, & Kim, 1997). In our study, we propose that innovation is positively associated with internationalization. Faced with constraints, such as a shortage of capital and managerial talent, firms based in emerging markets must concentrate their limited resources on several innovative products and services to target niche markets (Luo & Tung, 2007). Otherwise, many firms in emerging markets first enter the global market as subcontractors for foreign brands.

Firms with firm-specific or ownership advantages tend to generate more foreign direct investment (Dunning, 1988). Managerial and marketing skill, technology or production differentiation are usually identified as types of firm-specific advantage (Hymer, 1960). Firms exploit such advantages in foreign markets to compete with local firms in the host country (Caves, 1974). Research has found that innovative firms have a greater motivation to progress in internationalization. In the complex and competitive global market, innovative abilities help firms develop new products and assess opportunities to enter new markets.

Innovation affects a firm's productivity, which increases the likelihood of the firm entering a foreign market (Cassiman & Golovko, 2011). Firms increase productivity and bring better products and services that increase competitive advantages to compete with rivals while entering foreign countries. Li (1999) also found that innovation experts have a positive impact on new product performance in foreign markets. Lee and Habte-Giorgis (2004) demonstrated that firms use innovative advantages to earn high profits and acquire market share in a host country. Thus, we propose a positive relationship between innovation and internationalization:

Hypothesis 3: A high level of innovation relates positively to the level of internationalization.

Innovation, internationalization and performance

Innovation represents a firm's ability to develop products and, in turn, to improve its current competitive position (Li, 1999; Zahra, Ireland, & Hitt, 2000). Innovation is associated with lowering costs by enhancing operational efficiency. Upgrading the current base in order to provide customized products and services can earn higher levels of customer satisfaction. Thus, innovative activities improve production and the managerial processes that lead to enhanced product quality, and ultimately increase the firms' competitive positions (Filatotchev & Piesse, 2009).

Innovation provides firms with tacit knowledge and substitutable capabilities, which enable them to rapidly introduce new products and technologies. By adopting innovations in products, technology and administration, firms can compete with rivals and respond to environmental change swiftly. It emerges that innovation allows firms to sustain their competitive advantage, which makes them difficult for rivals to imitate; this in turn allows firms to earn higher profits (Barney, 1991). Innovation helps to increase both market penetration and profitability (Hitt, Hoskisson, & Ireland, 1994; Kim & Mauborgne, 2002). The skillful exploitation of innovative knowledge and technology makes it easier for firms to enter new markets, which will fuel the firm's growth (Autio, Sapienza, & Almeida, 2000). All of the above-mentioned actions help firms achieve higher performance:

Hypothesis 4a: Firms' innovation relates positively to performance.

Numerous studies have examined the relationship between internationalization and performance; however, the findings are inconsistent (e.g., Tallman & Li, 1996; Hitt, Hoskisson, & Kim, 1997; Delios & Beamish, 1999; Gomes & Ramaswamy, 1999; Geringer, Tallman, & Olsen, 2000). Studies that have explored larger companies in developed countries have found a positive relationship between internationalization and firm performance (i.e., Grant, Jammine, & Thomas, 1988; Tallman & Li, 1996). These studies suggest that firms outperform due to stretching their core competences, such as advanced technology, reputation, learning experience and organizational ability, in international markets (e.g., Grant, 1987; Geringer, Beamish, & daCosta, 1989; Kim, Hwang, & Burgers, 1993). They can allocate their intangible resources through networks of headquarters and subsidiaries. Through the process of sharing, integrating and coordinating key resources among headquarters and subsidiaries, firms earn the advantages of economies of scale and achieve higher profitability (Grant, Jammine, & Thomas, 1988).

Research has suggested that firms from emerging markets, with limited management resources and international experience, find that costs exceed benefits in the early stages of internationalization, which creates a negative relationship between internationalization and a firm's performance (Contractor, Kundu, & Hsu, 2003; Contractor, Kumar, & Kundu, 2007). However, firms in emerging markets often use their organizational and strategic innovative capabilities to compensate for a lack of financial and managerial abilities (Mathews & Zander, 2007).

Many firms from emerging markets are affiliations of business groups, so they enjoy shared internal capital and managerial resources that facilitate entry to foreign markets (Contractor, Kumar, & Kundu, 2007). Firms from emerging markets demonstrate strong networking and absorptive abilities that convert constrained managerial resources into a positive performance (Kotabe, Jiang, & Murray, 2010; Musteen, Francis, & Datta, 2010). A highly competitive home country may also lead firms in emerging markets to exploit particular capabilities and knowledge of weak institutional environments to develop unique competences that they can leverage in foreign markets. Thus, we argue that there is a positive relationship between internationalization and firms' performance in emerging markets:

Hypothesis 4b: High levels of internationalization relate positively to firms' performance.

METHODS

Sample and data

We sampled firms from the electronics industry that were listed on the Taiwan Stock Exchange and the Gre Tai Securities Market from 2007 to 2009. The choice of one industry reduced the potential for confounding influences (Tihanyi et al., 2000). We obtained data on innovation and firms' performance from the *Taiwan Economic Journal*, while the demographic profile (including functional background, international experience and size) of TMTs was gathered from the companies' annual reports, which contain the educational background, including the highest level of education and graduated school, and prior job experience of the managers who implement critical decisions in the firm, as well as the prior job title and company name of the manager. Thus, we coded the functional background heterogeneity and international experience based on whether or not the manager had study experience or work experience outside Taiwan. According to the measurement of functional background heterogeneity, the managers' background was categorized according to the criterias and procedures outlined in Wiersema and Bantel (1992). This categorization and measurement was based on prior TMT literature (e.g., Bantel & Jackson, 1989; Tihanyi et al., 2000; Carpenter and Fredrickson, 2001; Carpenter, 2002). Initially, our study sample consisted of 589 listed firms in the electronics industry. Following Carpenter's (2002) suggestion, TMT characteristics from time t were used to predict firm innovation, internationalization and performance at $t + 1$ and $t + 2$ and the control variables were from time t as well. After excluding firms that had incomplete information regarding TMT characteristics, innovation, internationalization and performance, our sample comprised 1,005 observations from 335 companies over a period of 3 years.

Measures

Dependent variables

Innovation. In this paper, we used R&D intensity as a proxy of a firm's innovation. R&D intensity was measured as the percentage of R&D expenditure within total sales. R&D intensity is also considered as a proxy measure of innovation in other studies (e.g., Hitt, Hoskisson, & Kim, 1997). Several research studies have argued that R&D intensity is an input measurement of innovation and highly associated with innovative outputs, such as patents (Hitt, Hoskisson, Ireland, & Harrison, 1991) and new product introduction (Hitt, Hoskisson, Johnson, & Moesel, 1996). It thus follows that firms in emerging markets are generally in the early stages of innovation and their innovation output may be limited. Applying innovative output indicators, such as patents and new product introductions, to examine the firms' innovations in emerging markets may not be appropriate. Thus, we followed this approach and employed R&D intensity to measure the firms' innovation.

Internationalization. A number of foreign subsidiaries served as a proxy for internationalization. Previous research has adopted different measures of internationalization, including the number of foreign subsidiaries, ratio of foreign sales to total sales, ratio of foreign revenue to total revenue and ratio of foreign assets to total assets (Geringer, Beamish, & daCosta, 1989; Tallman & Li, 1996). Among these measures, the ratio of foreign sales to total sales (or the ratio of foreign assets to total assets) was widely used in prior research (e.g., Geringer, Beamish, & daCosta, 1989). These studies, however, have focused on firms from developed countries. Firms in emerging markets may have just started to enter foreign markets, consequently they exhibit low ratios of foreign sales to total sales. This situation reflects a different stage of internationalization compared with firms from developed countries, thereby reducing the relevance of adopting this proxy to measure the level of internationalization of firms from emerging markets (Lall, 1996). Thus, the number of foreign subsidiaries is a more

appropriate measurement of internationalization in our study (e.g., Grant, 1987; Geringer, Beamish, & daCosta, 1989; Collins, 1990). Regarding the number of subsidiaries with skewed attributes, we performed a logarithmic transformation in such cases (Russell & Dean, 2000; Hutzschenreuter & Horstkotte, 2013).

Performance. Researchers have adopted a range of measurement of firms' performance. Return on assets is one of the most widely accepted indicators of performance. This measure is useful in assessing the performance implications of business strategies because it captures the firm's ability to manage and perform assets effectively. It is also an objective assessment of a firm's performance.

Independent variables

Prior studies have employed various TMT definitions and obtained mixed results regarding the impact of TMT characteristics on strategic decision making (Certo et al., 2006). For example, several studies have identified the top two tiers of an organization's management as TMTs (i.e., Carpenter & Fredrickson, 2001; Carpenter, 2002). Other studies have defined all executives above the vice president level (i.e., Hambrick, Cho, & Chen, 1996; Tihanyi et al., 2000). In this study, we identified TMTs as the members of the managerial board or the executive committee listed in the firms' annual reports. This definition is broader than that used in previous studies; however, in emerging markets, managers tend to employ a collective decision-making process. These executives were reported in the company annual reports as having power in critical organizational decisions, which also reflect the profile of their firm's strategic decision team.

Functional background heterogeneity. Information about the TMT members' work experience was obtained from the biographies published in the company annual reports. Following the previous studies, we measured functional background heterogeneity and classified the executives' functional background experience into eight categories: general business, engineering, finance and accounting, marketing, R&D, production and operations, legal, and other (Bantel & Jackson, 1989; Tihanyi et al., 2000). Employing Blau's (1977) heterogeneity measure, we evaluate functional background heterogeneity as $1 - \sum(P_i)^2$, where i is the proportion of the team in the i th functional category. A score close to 1 indicated a TMT with a higher level of heterogeneous functional background.

International experience. Based on prior studies, we measured international experience according to the number of TMT members who had studied or worked abroad (Wiersema & Bantel, 1992). This dimension was scored either 1 or 0, where the former indicated that the executive had studied or worked outside Taiwan and the latter indicated that they had not. The final measure was the proportion of members of the TMT who had international experience.

Control variables

TMT size. The TMT's size influences the extent of the firm's managerial resources. Larger TMTs might contain members with more diverse knowledge and skill backgrounds that improve their teams' strategic decision-making abilities (Tihanyi et al., 2000). We measured TMTs' size by the number of TMT members and data that were extracted from the firms' annual reports.

Educational background heterogeneity. Educational background heterogeneity was measured with Blau's (1977) heterogeneity index: $H = 1 - \sum_{i=1}^n S_i^2$, where H is the homogeneity index, S the percentage

of TMT members with dominant educational track i , and n the number of different educational backgrounds (Wiersema & Bantel, 1992). We coded educational background into six categories: arts, sciences, engineering, business and economics, law and other. This indicator varies between 0 and 1, where a value close to 1 represents higher heterogeneity in educational backgrounds and a lower value indicates a uniform TMT educational background.

Firm size. Firm size relates to both a firm's ability to engage in innovative and international activities and its competitive position in the industry (Chatterjee & Wernerfelt, 1991). The larger firms tend to have more diverse TMTs, which also reflect the relationship between the TMTs characteristics and the organizational outcomes (Carpenter, 2002). Thus, we controlled for firm size and measured it as a natural logarithm of the number of employees.

Firm age. A firm's age is related to its experience, knowledge and ability to identify environmental changes and opportunities in international market (Autio, Sapienza, & Almeida, 2000). It potentially influences its experience and ability to make decisions regarding innovation and internationalization. We calculated the log of the number of years that the firm had been operating until 2007 to represent its age.

Leverage capability. Firms in emerging markets typically exhibit low debt-to-equity ratios in a way that reflects superior levels of unabsorbed slack resources and leverage capability (Tan & Peng, 2003; Chang & Rhee, 2011). Innovation and internationalization require financial investment, which depends on the firm's ability to leverage financial resources (Li & Meyer, 2009). Thus, we included the leverage ability as a control variable and measured it as the ratio of total debts to total assets.

Industry dummy. Innovation and Internationalization may vary across industry factors. As a result, we controlled for the possible effects of the industry and created dummy variables to categorize the firm engaged in manufacturing-oriented activities (code as 0) or service oriented (code as 1).

Year dummy. Year dummy is created (code as 1) if the company is listed in 2007–2009, respectively.

RESULTS

Table 1 lists the descriptive statistics and variables. The firms, on average, owned 6.4 subsidiaries and had an R&D intensity of 6.25%. The average functional background heterogeneity of team managers was 0.566 and the proportion of executives who had studied or worked abroad was 0.167. The correlation table indicates that no two variables exhibited a correlation of >0.5 . Our finding shows a significant positive correlation between firm size and international experience of TMTs (correlation = 0.0810, $p < .01$) but a nonsignificant correlation with functional background heterogeneity of TMT members (correlation = -0.0313 , $p > .1$). It suggests that larger firms tend to recruit more international-oriented executives but this is not associated with prior functional experience diversity. The variance inflation factor was checked respectively for all of the models to lessen the possible of multicollinearity and autocorrelation problem. The variance inflation factor ranged from 1.01 to 1.28, which demonstrates that multicollinearity is not a concern.

Table 2 displays the results of the ordinary least squares regression analysis. Model 1 in Table 2 is the base model while Model 2 examines the effect of the TMTs' characteristics on innovation. The effect of firm size, firm age and debt ratio is negatively related to innovation ($\beta = -0.128$,

TABLE 1. DESCRIPTIVE STATISTICS AND CORRELATIONS

Variables	Mean	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Performance	6.28	12.08	1.00											
2. Innovation	4.84	6.70	-0.08**	1.00										
3. Internationalization	1.49	0.91	0.07**	-0.09***	1.00									
4. Functional heterogeneity	0.57	0.19	0.02	0.06*	-0.05	1.00								
5. International experience	0.17	0.16	0.01	0.229***	0.111***	0.05	1.00							
6. TMT size	6.31	4.22	0.103***	-0.08***	0.411***	0.08	0.115***	1.00						
7. TMT educational heterogeneity	0.47	0.20	0.00	-0.10***	0.116***	0.294***	0.02	0.313***	1.00					
8. Firm size	7.12	1.57	0.188***	-0.227***	0.614***	-0.03	0.08***	0.435***	0.151***	1.00				
9. Firm age	2.93	0.42	-0.05	-0.220***	0.211***	-0.04	-0.161***	0.06**	0.09***	0.185***	1.00			
10. Debt ratio	38.85	17.99	-0.212***	-0.364***	0.185***	0.00	-0.10***	0.195***	0.106***	0.272***	0.09***	1.00		
11. Industry dummy	0.89	0.31	0.03	-0.01	0.04	-0.03	0.06**	-0.07**	-0.124***	0.247***	-0.01	-0.10***	1.00	
12. Year dummy1	0.33	0.47	0.238***	-0.07**	-0.07**	0.04	-0.02	0.02	0.00	0.03	-0.10***	0.01	0.00	1.00
13. Year dummy2	0.33	0.47	-0.02	0.01	-0.06*	-0.07	-0.01	0.02	0.03	-0.02	0.00	0.00	0.00	-0.500***

TMT, top management teams.

*** $p < .01$; ** $p < .05$; * $p < .1$.

TABLE 2. THE EFFECT OF TMT CHARACTERISTICS ON INNOVATION, INTERNATIONALIZATION AND PERFORMANCE

Variables	Model 1 Base		Model 2 Innovation		Model 3 Base		Model 4 Internationalization		Model 5 Base		Model 6 Performance	
	β	t	β	t	β	t	β	t	β	t	β	t
Functional heterogeneity			0.054*	1.81			-0.038	-1.51				
International experience			0.179***	6.16			0.060**	2.4				
Innovation							0.071**	2.65			-0.147***	-4.67
Internationalization											0.005	0.14
TMT size	0.061*	1.81	0.037	1.12	0.183***	6.55	0.172***	6.17	0.052	1.57	0.060*	1.78
TMT educational heterogeneity	-0.053	-1.77	-0.071*	-2.28	-0.033	-1.32	-0.018	-0.69	-0.034	-1.13	-0.041	-1.39
Firm size	-0.117**	-3.32	-0.128***	-3.70	0.545***	18.83	0.544***	18.51	0.275***	7.86	0.255***	6.27
Firm age	-0.177***	-6.03	-0.142***	-4.88	0.087***	3.55	0.108***	4.32	-0.041	-1.40	-0.068**	-2.27
Debt ratio	-0.325***	-10.73	-0.299***	-9.96	0.008	0.31	0.039	1.48	-0.316***	-10.47	-0.364***	-11.51
Industry dummy	-0.027	-0.88	-0.036	-1.18	-0.084**	-3.25	-0.082**	-3.23	-0.059*	-1.93	0.063**	-2.05
Year dummy1	-0.098**	-2.95	-0.085**	-2.62	-0.133***	-4.80	-0.122***	-4.42	0.296***	8.96	0.283***	8.51
Year dummy2	-0.040	-1.23	-0.027	-0.85	-0.115***	-4.18	-0.113***	-4.11	0.133***	4.05	0.128***	3.89
F-value	37.58***		28.73***		122.75***		73.74***		25.29***		27.11***	
R ²	0.1843		0.224		0.425		0.450		0.132		0.214	
Adjusted R ²	0.1794		0.216		0.421		0.444		0.127		0.206	
ΔR^2			0.040***				0.025**				0.082***	

TMT, top management teams.

*** $p < .01$; ** $p < .05$; * $p < .1$.

$p < .01$; $\beta = -0.142$, $p < .01$; $\beta = -0.299$, $p < .01$). The results represent the tendency of smaller and younger firms to have a higher performance on innovation. We can also see that the firms with lower debt ratios are likely to use their own capital prudentially. The year dummy of 2008 also influences innovation ($\beta = -0.085$, $p < .05$). The results in Model 2 indicate that functional background heterogeneity relates positively to firms' innovation ($\beta = 0.054$, $p < .1$). This result supports Hypothesis 1a. We also found a significantly positive relationship between international experience and innovation ($\beta = 0.179$, $p < .01$), thereby supporting Hypothesis 1b.

Model 4 presents the relationship between TMTs' characteristics and internationalization. The effect of firm size and firm age is positively related to internationalization ($\beta = 0.544$, $p < .01$; $\beta = 0.108$, $p < .01$). The results reflect the higher internationalization of larger and older firms. The year dummy of 2007 and 2008 also influenced internationalization ($\beta = -0.122$, $p < .01$; $\beta = -0.113$, $p < .01$). The result also indicates that the effect of functional background heterogeneity on internationalization is nonsignificant ($\beta = -0.038$, $p > .1$). This suggests that the TMTs' functional background heterogeneity does not drive internationalization, which does not support Hypothesis 2a. However, we did discover a positive relationship between international experience and firms' internationalization ($\beta = 0.060$, $p < .05$). Therefore, Hypothesis 2b is supported.

Model 4 also demonstrates the influence of innovation on internationalization. The results also show that the effect of innovation on internationalization is positively significant ($\beta = 0.071$, $p < .05$). This suggests that firms' innovative activities drive internationalization, which supports Hypothesis 3. Model 6 displays the influence of innovation and internationalization on performance. The effect of firm size is positively related to performance ($\beta = 0.255$, $p < .01$), which indicates that larger firms with more resources and capabilities can thereby perform better. Moreover, firm age and debt ratio are negatively related to performance ($\beta = -0.068$, $p < .05$; $\beta = -0.364$, $p < .01$). The results represent the ability of younger firms with a lower debt ratio to achieve a better performance. The year dummy variables also have an influence on performance as well ($\beta = 0.283$, $p < .01$; $\beta = 0.128$, $p < .01$). The results reveal that innovation relates negatively to performance ($\beta = -0.147$, $p < .01$). This suggests that firms' commitment to innovative activities may hamper their performance; this result is contrary to Hypothesis 4a. However, the result indicates a nonsignificant relationship between internationalization and performance ($\beta = 0.005$, $p > .1$). Firms with more international experience achieve superior performance, and this finding does not support Hypothesis 4b.

DISCUSSION

In this study, we examined the influence of TMTs' functional background heterogeneity and international experience on firms' innovation and internationalization. The relationship between innovation, internationalization and performance was also investigated. We found that the TMTs' functional background heterogeneity contributes to the firms' innovation. Moreover, the TMT's international experience relates positively to innovation and internationalization. Firms with higher levels of innovation contribute to higher levels of internationalization. However, the benefit of internationalization on organizational outcome is only shown in the 2-year lag performance.

Our results also reveal a nonsignificant relationship between functional background heterogeneity and internationalization. This result departs from our argument in Hypothesis 2a that the TMTs' diverse functional background would tend to generate firms with greater levels of internationalization. This finding indicates that TMTs with a heterogeneous background do not contribute to internationalization. Both our finding and other studies with samples from Western developed countries discovered a nonsignificant effect of heterogeneous functional background on internationalization (e.g., Tihanyi et al., 2000; Herrmann & Datta, 2005). The explanation of this finding may be that the success in operation of international business needs to be combined with other

experience, such as industry experience and operational experience related to the host country, and bundled with local contexts, (Meyer, Mudambi, & Narula, 2011) in order to have a higher predictability on the influence on internationalization. Tihanyi et al. (2000) suggest that the lack of an association may be due to the industry selected. Industries with a dynamic environment, such as the electronics industry, would be likely to attract executives with similar functional backgrounds.

Furthermore, according to our findings of the positive effect of international experience on innovation and internationalization, we determined that the positive effect of international experience is confirmed both in firms from Western developed countries and emerging markets (e.g., Bantel & Jackson, 1989; Carpenter & Fredrickson, 2001; Tihanyi et al., 2000; Herrmann & Datta, 2005). Our results extend these earlier findings from developed countries to emerging markets. This study suggests that the strategic decisions of innovation and internationalization are associated with the TMT's international experience.

Contrary to our expectations, we found that high levels of innovation neither contribute to nor hamper performance. A possible explanation is that firms in emerging markets are in the early stage of innovation. R&D spending is an unconvertible investment, and the contribution to superior performance may need a longer period of time. Prior study also demonstrated that R&D investments convert into revenue-generating products typically within a period of 3 years (Kor & Mahoney, 2005). In a highly competitive industry, such as the electronics industry, the firms' superior performance quickly dissipates in the extremely volatile environment. Thus, in our study, innovation causes a negative impact on performance for firms from emerging markets.

Finally, we did not find a link between internationalization and performance, which may reflect the lag effect of internationalization on performance. We employed a 2-year lag between internationalization and performance to check if the positive effect of internationalization on superior performance appears 2 years later. This approach allowed enough time for the potential benefit of internationalization to become apparent ($\beta = 0.086$, $p < .05$). The finding indicates that firms with a higher level of internationalization tend to have a superior performance 2 years later. The explanation may be that firms from emerging markets usually have less managerial experience and resources and are latecomers to the international environment (Luo & Tung, 2007). They need more time to accumulate experience and knowledge of the international environment (Lu & Beamish, 2001). Even if the firms set up subsidiaries in foreign countries, an improved performance may not appear immediately. Therefore, a firm's engagement in international activities and leverage of resources from the international environment may not yield any significant rise in revenue generation.

According to the findings of the control variables, smaller and younger firms with lower debt ratio have a better innovation performance. Compared with large companies, smaller and younger firms have a greater willingness to take risks during the innovative process. Employing greater flexibility while engaged in innovative process, they tend to have higher innovation. Companies with lower debt ratios tend to evaluate risky innovative activities more cautiously, and thereby have more innovative outcomes. The findings also suggest that larger and older companies tend to have higher internationalization, which may reflect the companies' greater resources and knowledge related to international environment. They also possess the confidence required to face the uncertainty of global market. Thus, they tend to have a higher level of internationalization. The findings also show that young larger firms with lower debt ratio have a better performance, which indicates that young firms have a higher willingness to embrace risk and uncertainty. They also possess more managerial and financial resources, and thereby perform better than other companies.

Particularly, according to the findings of the influence of control variables on performance. Carpenter (2002) found that firm size is negatively related to firm performance but our finding shows that firm size contributes to performance. This finding also supports the argument from prior literature that firm size is related to both a firm's resources and capabilities to engage in innovative and

international activities and to enhance its competitive position in the industry (Chatterjee & Wernerfelt, 1991). However, Carpenter (2002) concluded that a heterogeneous educational background is positively related to performance but we obtained a nonsignificant finding. Our sampling of the firms in the electronics industry demonstrated that the executive's educational background is more uniform. Given the fast-changing environment in the electronics industry, the knowledge learned from school contributes less to performance. Thus, we obtained a nonsignificant effect of educational background heterogeneity on performance.

Finally, we found the year dummy has an influence on innovation, internationalization and performance. The findings reveal that the TMTs characteristics have less influence on innovation and internationalization in the year after 2007. A possible explanation is that the 2008 financial crisis lowered the TMTs' willingness to engage in innovation and internationalization. The financial crisis may have driven the TMTs to adopt a more conservative attitude and detailed evaluation toward innovation and internationalization that contributes to enhanced performance.

CONCLUSIONS

Our study extends previous research that focused on examining the role of TMTs on firms in developed countries, to consider the role of the TMTs' strategic decisions in emerging markets. We investigated how the TMTs' functional background heterogeneity and international experience impacts strategic decisions towards innovation and internationalization for firms in emerging markets. In this study, we also considered the relationship between internationalization and innovation with respect to the firms' performance.

Theoretical implications

According to our results, higher levels of TMTs' functional background heterogeneity and international experience are associated with the firms' higher level of innovation (Hypotheses 1a and 1b). This supports the notion that the TMTs' diverse information sources and knowledge accumulated from functional background and international experience provide firms with more opportunities and time to develop innovative thoughts and ideas (Carpenter & Fredrickson, 2001).

We also found support for the positive relationship between the international experience of TMTs and internationalization (Hypothesis 2b), which provides evidence that the TMTs' international experience is a critical driver of international strategic decisions for firms in emerging markets. International-oriented TMTs benefit firms by allowing them to overcome the challenge of uncertainty and complexity in international markets. While other studies have found that TMTs' international experience relates to the firms' international involvement, they have focused on the context of firms in developed markets (e.g., Sambharya, 1996; Tihanyi et al., 2000). Our study contributes to revelations that the TMTs' international experience is also important for smaller firms and those with fewer resources in emerging markets when making decisions about international investments. This highlights the importance for firms to cultivate their executives' knowledge of international markets.

Our finding of the positive impact of TMTs' innovation on the level of firms' internationalization (Hypothesis 3) is also consistent with previous studies. Innovation can create a competitive advantage and build an intangible asset that will result in a higher competitive position in the international environment (Caves, 1974).

We contribute to the literature by addressing the application of the upper echelons theory to emerging markets. The results demonstrate that the executives' international experience is highly associated with achieving high levels of innovation and internationalization. The findings provide

evidence to generalize the importance of TMTs' international experience to firms from emerging markets. For firms from emerging markets, developing executives with a global mindset and diverse functional experience is critical for success in international markets.

Managerial implications

The TMTs' international experience helps executives to accept novel situations, which creates an environment conducive to innovation. For Taiwanese firms, developed countries are a vital export market. The higher international experience of executives enables them to develop innovative products and services that match the preferences of foreign customers. Thus, innovation-oriented firms should target candidates with international experience when recruiting managers. Providing job rotation opportunities also helps executives to accumulate more international experience. We found that functional background heterogeneity is not positively related to internationalization. We suggest that firms provide learning opportunities for the managers to better understand the resources and institutions in a local context, in order to gain more localized knowledge related to practical operation and industry experience.

Research limitations

This study had several limitations. We only used objective archival data to measure the TMTs' experience and knowledge, therefore we suggest that future studies employ survey data to identify the managers' experience and knowledge. It also useful to combine and compare with the multiple data sources from published data and survey data respectively, and provide a more reasonable explanation about the influence of the TMTs attributes on strategic decision and performance. Future studies can gather the TMTs' cognitive variables, such as power relationship and trust between members, through survey data to acquire a more in-depth understanding of the cognitive processes in strategic outcomes. Second, we only focused on examining the effect of the TMTs' experience and on internationalization and innovation. Future studies can expand the focus to investigate the different influence on other strategic decision options, such as designing and planning strategies, mergers and acquisitions, internal reorganizations, disinvestments, making and buying options, to better comprehend the effect of the managers' experience and knowledge on the strategic decision-making process.

Furthermore, we concentrated on firms from emerging markets that are in the early stage of innovation and are latecomers to innovation. We recommend that future studies use survey data to collect various types of innovation, such as technological innovation, product innovation or administration innovation, which may cause different innovative effects on performance. Finally, the sample employed in this study consisted of listed companies in the electronics industry. We suggest that future research expand this study into other industries in order to compare types of innovative and international activity. We also did not consider other innovative performances, such as patents and new product development, as potential factors affecting firm performance. Future research could regard new product development as another measurement of innovation.

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