



Internationalization and firm performance of SMEs: The moderating effects of CEO attributes

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ABSTRACT

This paper examines the impact of CEO attributes on the internationalization–performance relationships of SMEs. Based on the upper echelons and information processing theories, we argue that CEOs play an important role in the internationalization of SMEs. Furthermore, some of the attributes of CEOs who have a greater information processing capability have positive moderating effects on the internationalization–performance relationship. Using panel data of 187 Taiwanese SMEs that expanded abroad, we find that age, educational level, international experience, and duality of the CEO have moderating effects on the relationship between internationalization and firm performance.

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1. Introduction

The expansion into international markets and the use of resources from foreign sources by small- and medium-sized enterprises (SMEs) have increased dramatically (Fliess & Busquets, 2006; Lu & Beamish, 2001). International expansion provides firms with the opportunity for growth and the ability to access knowledge in foreign locations, but at the same time, it produces high costs and uncertainties (Contractor, Kumar, & Kundu, 2007). Although there is a vast body of literature on the internationalization–performance relationship, many unanswered questions remain (Hitt, Tihanyi, Miller, & Connelly, 2006). Previous research has examined the internationalization–performance relationship by focusing on firms' endogenous factors (e.g., product diversification, size, and firm-specific assets) and exogenous factors (e.g., culture and institutions) (for reviews, see Hitt et al., 2006; Li, 2007). Few studies, however, have directly examined how top executives influence the operation of a firm's internationalization and subsequent performance.

In a study of internationalization and firm performance, Hennart (2007) argued that prior research underplays the roles of management. Vermeulen and Barkema (2002) proposed that the characteristics of senior management influence the organizational absorptive capacity and moderate the performance of a firm

during international expansion. Sapienza, Autio, George, and Zahra (2006) suggested that managerial competence plays an important role in internationalization because managers are able to draw upon their competencies and experiences as they facilitate the establishment and operation of new offices, and they are able to decide how to organize activities dispersed across the world (Daily, Certo, & Dalton, 2000). Therefore, without taking into consideration the context of managerial competence in the internationalization–performance model, the findings remain incomplete.

This study attempts to fill the research gap by incorporating the effect of the attributes of chief executive officers (CEOs) into the internationalization–performance relationship. When firms move into new international markets, information-processing demands increase and become more complex (Roth, 1995; Sanders & Carpenter, 1998; Tihanyi & Thomas, 2005). At this time, a firm's CEO plays an important role as his/her attributes exert a critical influence on the firm's ability to process the information associated with internationalization (Roth, 1995). Information processing theory posits that, if a firm's information processing capacity meets or exceeds its information processing demands, firm performance is enhanced (Tushman & Nadler, 1978). The upper echelons theory also proposes that, to manage international complexity and ambiguity, managers should possess characteristics that enable them to process information effectively (Herrmann & Datta, 2002, 2006; Nielsen & Nielsen, 2011). Therefore, based on the upper echelons and information processing theories, this study builds a theoretical argument as to why and how the attributes of CEOs matter.

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Building and managing an international business is a complex task (Ghoshal & Bartlett, 1990). Top executives confront many diverse and often ambiguous stimuli. Because of the limits of the human intellectual capacity, humans attempt to reduce cognitive effort using heuristics and cognitive schemas to integrate pieces of information into a single judgment when making a decision (Schwenk, 1988). Hambrick and Mason (1984) suggest that CEO characteristics greatly influence their interpretation of strategic decision-making situations and, in turn, affect the firm's outcome. Herrmann and Datta (2005) argue that under higher uncertainty in an ambiguous environment, top executives who are flexible and open to change exhibit greater tolerance for ambiguity. Those who possess superior information processing abilities can manage the complexities of international business effectively. Research based on the upper echelons theory found that several attributes of top executives, such as international experience (Daily et al., 2000; Kirca, Hult, Deligonul, Perry, & Cavusgil, 2012), educational level (Herrmann & Datta, 2005; Tihanyi, Ellstrand, Daily, & Dalton, 2000), age (Herrmann & Datta, 2005; Tihanyi et al., 2000), positional tenure (Herrmann & Datta, 2005) and duality (Roth, 1995; Sanders & Carpenter, 1998), can be proxies for their cognitive orientation, knowledge base and information processing abilities and, consequently, have an impact on the firm's internationalization behavior. This study uses CEO age, positional tenure, educational level, international experience, and duality as moderator variables to examine the association between internationalization and firm performance.

Prior research suggests that small firms are preferred when investigating the effects of CEO attributes on organizational outcomes (Miller & Droge, 1986; Roth, 1995). Small firms are less hierarchical in structure and are less constrained by organizational inertia. Furthermore, CEOs of small firms are often the central decision-makers and may even control the composition of their firms' senior decision-making team. In addition, small firms have limited resources and capabilities in the area of information systems. As a result, the information processing demands of foreign operations may be greater for CEOs in smaller firms (Tihanyi & Thomas, 2005).

Based on the upper echelons and information processing theories, and using panel data from 187 Taiwanese SMEs that expanded abroad, we developed and tested hypotheses with respect to the moderating effects that CEO attributes have on the internationalization–performance relationship. Consistent with our expectations, this study found that a firm's performance not only depends on its degree of internationalization but also on the characteristics and information processing capability of its CEO.

2. Literature

2.1. Internationalization and firm performance

Internationalization is an important growth strategy for firms whose home country market is limited since it enables firms to realize economies of scale and scope (Caves, 1996), increase their market power (Kogut, 1985), and reduce input costs (Dunning, 1988). It also allows firms to exploit their firm-specific assets, especially intangible ones, in international markets (Caves, 1996; Delios & Beamish, 1999). Firms with subsidiaries in different countries have the opportunity to access host-country-specific advantages and, subsequently, to increase their knowledge base, capabilities, and competitiveness through experiential learning (Barkema & Vermeulen, 1998; Ghoshal & Bartlett, 1990).

Expansion into new geographic markets presents an important opportunity for firm growth and value creation. The implementation of such a strategy involves high costs and many challenges

that are often associated with the liabilities of foreignness (Hymer, 1976; Zaheer, 1995) and newness (Stinchcombe, 1965). Additionally, the management of subsidiaries in foreign countries is complex and requires significant internal coordination. One source of complexity arises from the great diversity among cultures, customers, competitors, and regulations. When a firm enters a new location, its managers must invest time and effort in establishing the firm's presence. Senior managers with a domestic managerial mindset are often unfamiliar and unprepared for cultural diversity, thus pressuring management to fragment their attention geographically (Ghoshal & Nohria, 1989). Therefore, moving into a highly institutional, distant country may negatively affect a firm's performance. Another source of complexity for internationalizing firms is that of competitive pressure. Firms competing worldwide must extract synergies across products and markets, develop the capacity to reconcile system and subsystem priorities, and develop a sense of community within the organization's global web of subsidiaries (Bartlett & Ghoshal, 1989). To be successful, these complexities and internal coordination processes increase the workload and the information processing demands placed on senior managers.

Past research regarding the impact of internationalization on a firm's performance has resulted in a vast body of literature. While some studies show a positive effect (e.g., Bausch & Krist, 2007; Pangarkar, 2008), others show a negative (e.g., Collins, 1990; Geringer, Tallman, & Olsen, 2000), U-shaped (e.g., Lu & Beamish, 2001; Ruigrok & Wagner, 2003), inverted U-shaped (e.g., Chao & Kumar, 2010; Hitt, Hoskisson, & Kim, 1997), or S-shaped (e.g., Contractor, Kundu, & Hsu, 2003; Lu & Beamish, 2004) effect. Some scholars argue that the inconsistent findings result from a lack of uniformity in the key dependent (performance) variables and the doubtful validity of the independent (internationalization) variables (Hitt et al., 2006). Lu and Beamish (2004) suggest that the conflicting findings may result from the changes in the benefits and costs during the time that it takes to execute an internationalization strategy. Contractor et al. (2007) argue that the inconsistent results are not actually contradictory but merely represent different stages of the three-stage theory rendered significant in the statistical analyses.

Most prior studies investigated the internationalization–performance relationship in the context of organizational internal capability or industry effect, but few studies have examined the moderating effects of the characteristics of top executives. In contrast, we argue that the attributes of CEOs influence a firm's implementation and processing of the information associated with internationalization, which, in turn, moderate the aforementioned benefits and costs of the firm's internationalization.

2.2. Upper echelons and information processing theories

Hambrick and Mason (1984) propose that the paths to organizational outcomes reflect the values and cognitive bases of top managers in the organization. According to the behavioral theory of the firm (Cyert & March, 1963), the experiences, backgrounds, and characteristics of top managers shape their cognitive perspectives and the differences in the affects of the strategic decision-making process, including issue identification, information seeking, and information processing. According to the upper echelon perspective, as managers begin to experience information overload, ambiguous cues, and competing objectives, they use their existing cognitive schemas to organize information efficiently and simplify their decision-making processes (Shaw, 1990). Therefore, the cognitive base of executives influences the decision-making process by directing their field of vision, filtering their perceptions, and interpreting the information (Hambrick, 2007; Hambrick & Mason, 1984).

The information processing theory argues that the capabilities of the manager to deal successfully with burgeoning information associated with organizational growth limits the development of a new firm (McGaffey & Christy, 1975). When complexity arises from the integration and coordination of dispersed activities, increasing the capacity of a firm to process information is likely a critical design strategy (Egelhoff, 1991). Therefore, when firms expand internationally, managers must develop information-processing mechanisms capable of coping with international complexity, that is, mechanisms that are able of ensuring the efficient gathering, and processing of relevant information (Tushman & Nadler, 1978).

The information processing theory has been applied at the individual (e.g., Leonard, Scholl, & Kowalski, 1999; Wang & Chan, 1995) and organizational levels of analysis (e.g., Egelhoff, 1991). Consistent with our approach to CEO attributes as an individual level construct, the current study applies the information processing theory at the individual level. An individual's information processing capability can be represented in terms of the cognitive abilities of the organizational members to learn about, make sense of, and make decisions for an organization. This processing capability can be influenced by the psychological and social psychological characteristics (e.g., values, beliefs, and culture) of the organizational members (Wood & Bandura, 1989). In addition, as previously mentioned, the upper echelons theory proposes that top executives often confront more information than they can fully comprehend. Because of the limits of human intellectual capacities, top executives employ their existing cognitive schemas and heuristics to simplify the decision-making process (Shaw, 1990). Hence, the upper echelons theory suggests that the characteristics of the CEOs shape their cognitive perspectives, thus affecting their abilities to tolerate ambiguity and integrate complexity, which are in turn associated with their information processing capability (Dollinger, 1984). As Cho and Hambrick (2006, p. 453) argue, "the upper echelons theory is principally a theory of information processing, with managers acting on the basis of their filtered construals of the situations they face".

Internationalization may provide SMEs with several opportunities, but capitalizing on these opportunities poses significant organizational challenges. The top two constraints faced by SMEs in internationalization are managerial competence and the lack of information (Karagozoglu & Lindell, 1998). Therefore, we expect that CEO attributes that are associated with their information processing capability play an important role in the international operations of SMEs. For example, Herrmann and Datta (2005) found that younger managers have an open mind and a greater willingness to adapt to new environments than do their older counterparts, which can enhance an SME's information-gathering capability. Sambharya (1996) argued that international experience may prove advantageous as top executives integrate the learned culture and face the uncertainties associated with international operations. Daily et al. (2000) also found that the international experience of the CEO has a significant positive effect on the relationship between international diversification and firm performance. Thus, we propose that CEOs who have a greater information processing capability are able to strengthen the association between internationalization and firm performance.

Some researchers criticize the demographic approach to develop proxy measures for individual information processing capabilities because it does not access the 'black box' (Lawrence, 1997). Based on the objectivity and availability of demographic data, Hambrick (2007) and Carpenter, Geletkanycz, and Sanders (2004) argue that the demographic characteristics of executives are valid proxies of executives' cognitive frames for developing predictions of strategic actions. Thus, we adapt that approach here.

3. Hypotheses

3.1. CEO age

Age has been linked to capacity for information processing and analysis. Researchers argue that older executives possess less physical and mental stamina and are more risk-averse (Child, 1974) than younger managers. Hambrick and Mason (1984) suggest that younger managers are more likely to seek growth through novel and innovative strategies in an effort to seize perceived opportunities than are older managers. These authors also argue that managerial age is negatively associated with the ability to integrate information when making decisions. Older managers are less able to organize information effectively, which may result in a poorer performance with respect to decision-making (Taylor, 1975) than younger managers.

When an SME goes global, it must learn how to operate in new institutional and cultural settings. Each newly formed subsidiary leads to a firm and its managers being confronted with new experiences in terms of customers, competitors, and stakeholders (Barkema, Bell, & Pennings, 1996). Managers are simultaneously required to adapt their home-grown mental maps and, consequently, the structures, systems, and processes rooted in these maps to fit a new international setting (Nohria & Ghoshal, 1994). Older managers, having less physical and mental stamina, may not be able to change their mental maps easily, thus resulting in a lesser degree of information processing capability than younger executives (Herrmann & Datta, 2002; Taylor, 1975). This may limit their understanding of foreign cultures, consumer behavior and local regulations and may reduce the benefits of internationalization. Building on the above set of arguments, we advance the following hypothesis:

Hypothesis 1. CEO age negatively moderates the relationship between the internationalization and the performance of an SME.

3.2. CEO position tenure

In the literature of the upper echelons theory, researchers and theorists often consider tenure as an indicator of a manager's ability to gather and process information. As Finkelstein and Hambrick (1996) posit, new executives with short tenures bring in fresh, diverse information and are willing to take risks, but over time, they rely more on past experience and develop a narrower frame of reference. Miller (1991) proposes that executives with a longer firm tenure often have restricted sources of information and engage in less information gathering and analysis than managers with shorter tenure.

Prior research found that managers of most SMEs do not perform global scanning. They may lack the information necessary to exploit international opportunities (Buckley, 1999), especially when different environments present different stimuli and information. International diversification is associated with the need for extensive gathering and processing of information. Longer-tenured top executives are less likely to adapt to new environmental settings and be enthusiastic about actively seeking such diversification information than their younger, less-tenured counterparts. Based on the belief that the information processing requirements are likely greater and more complex in an internationalizing firm, we expect the fresh knowledge, skills, and theory of a shorter-tenured CEO to be a prerequisite for the effective management of change (Finkelstein & Hambrick, 1996). Therefore, in view of the cognitive and information processing abilities of a CEO, the decisions of longer-tenured executives likely impair the relationship between internationalization and firm performance. Thus, we propose the following hypothesis:

Hypothesis 2a. CEO position tenure negatively moderates the relationship between the internationalization and the performance of an SME.

In contrast to our hypothesis, based on organizational familiarity, some empirical studies found that CEO tenure has a positive effect on the internationalization–performance relationship. Gupta and Govindarajan (1986) suggest that CEOs with longer tenure may be more familiar with organizational markets, technologies, people, processes, and cultures, which can help them to develop a more accurate shared cognitive structure regarding new environments. Michel and Hambrick (1992) also suggest that longer tenures of top managers may produce social cohesion and shared cognitive structures, and these attributes may enhance socialization and lead to better firm performance.

Organizing an international operation is a complex challenge and is not cost-free. It requires the establishment of effective systems and processes to schedule production and synchronize the dispersed activities (Carroll & Harrison, 1998). It also requires managers to ensure that formal and informal communication channels are in place to enable effective coordination among personnel responsible for the various complementary activities (Bartlett & Ghoshal, 1989). Tihanyi et al. (2000) propose that due to the complex and uncertain nature of international diversification, a shared understanding of the international environment may be critical. Organizational familiarity may enhance a CEO's interpersonal relationships with managers and subordinates, thus reducing the intrafirm communication cost; therefore, CEOs with longer tenure may have a greater familiarity with managing intrafirm information flows, thus enhancing the organizational information processing capacity. Based on organizational familiarity, we propose the following competing hypothesis:

Hypothesis 2b. CEO position tenure positively moderates the relationship between the internationalization and the performance of an SME.

3.3. CEO educational level

Educational level is another important dimension that helps shape an individual's cognitive base because it indicates a person's knowledge, skill base, values, cognitive preferences, etc. (Hambrick & Mason, 1984). Wiersema and Bantel (1992) posit that executives with high educational attainment may have a greater knowledge base and the increased competency required for the systematic evaluation of multiple options. Some studies find that more highly educated executives have a greater cognitive complexity (Herrmann & Datta, 2002, 2005; Hitt & Tyler, 1991) noting that education provides a greater ability to absorb new ideas and an increased capacity to process information. Therefore, high levels of education are associated with an increased capacity for information processing and a greater ability to discriminate among a variety of stimuli (Herrmann & Datta, 2002).

Different countries have unique features in terms of their cultural and institutional characteristics. A high level of internationalization implies that an SME has to learn more about unique national settings. Executives with high educational levels can engage, at times, in a more in-depth analysis of decision-making and thus may possess enhanced information processing capabilities, characteristics that are important for managing a firm engaged in internationalization. Hence, the sociocognitive capacities of executives related to their educational levels, particularly open-mindedness, greater information processing abilities, and flexibility to change, are likely to play important roles in ensuring success in the international context (Herrmann & Datta, 2005). Therefore, we posit that:

Hypothesis 3. CEO educational level positively moderates the relationship between the internationalization and the performance of an SME.

3.4. CEO international experience

The international experience of a CEO is important. The experience of working or living in a different country, with different customs and habits, has an important impact on a manager's cognitive orientation. These experiences may assist the manager in integrating culture and in dealing with the uncertainties associated with international operations (Sambharya, 1996). Greater experience may result in an increased awareness of complex managerial environments, and such knowledge of foreign markets is important in overcoming the psychic distance involved in doing business in foreign countries (Johanson & Vahlne, 1977; Nielsen & Nielsen, 2011). Consequently, international experience can be valuable for the development of a global mindset and for the enhancement of the information processing capability that allows managers to reconcile the tensions between the local and the global (Bartlett & Ghoshal, 1989) and to differentiate between and integrate across cultures and markets (Gupta & Govindarajan, 2002).

Daily et al. (2000) argue that international experience provides CEOs with an inimitable world view as well as knowledge and professional ties that assist them to better manage international operations. Experience in foreign markets allows firms to reduce the integration and coordination cost and enhances the ability to access foreign knowledge, which, in turn, increases the internationalization performance. Therefore, Carpenter, Sanders, and Gregersen (2001) emphasize the importance of developing and nurturing global leaders for firms to succeed in the highly competitive global environment. Building on the above set of arguments, we now advance the following hypothesis:

Hypothesis 4. CEO international experience positively moderates the relationship between the internationalization and the performance of an SME.

3.5. CEO duality

CEO duality describes the situation in which an executive holds the positions of both CEO and chairperson of the board, and its effect on firm performance is a subject of extensive debate. Daily and Dalton (1997) argue that duality may establish unity of command, clarify decision-making authority, and provide a faster response to external events. However, Boyd (1995) suggests that CEO duality may have serious shortcomings, such as a high degree of independence in thought and action, meaning that some CEOs may rule their organization without input from others. This can limit the type and quality of information the CEOs receive about potential opportunities in their industry or their internationalization activities. Buckley (1999) also argues that, due to constraints of management time, SMEs frequently take shortcuts in decision-making and information-gathering, which can be disastrous.

A single CEO cannot be aware of all factors influencing a decision; therefore, excessive centralization may impede a firm's ability to manage the dispersion of activities necessary to effectively implement international strategies (Bartlett & Ghoshal, 1989). In multinational companies, global integration and local responsiveness are important issues. A climate of participation and delegation is an important organizational mechanism. Sanders and Carpenter (1998) argue that in complex environments, such as firms with a high degree of internationalization, firms may require a greater delegation of authority and

division of responsibility. Consequently, more internationally diversified firms may be less likely to consolidate the positions of CEO and chairperson of the board, and the separation of the CEO and chairperson positions may, therefore, be advantageous for international firms.

Hypothesis 5. CEO duality negatively moderates the relationship between the internationalization and the performance of an SME.

4. Methods

4.1. Data collection

There is no generally accepted definition of an SME. A commonly employed approach is the quantitative definition, which uses measures such as the number of employees, total sales, and total assets. According to the Small and Medium Enterprise Administration of the Ministry of Economic Affairs, R.O.C., the definition of an SME in the manufacturing industry is one that employs 200 or fewer workers; hence, firms consisting of 200 or fewer employees are chosen as our sample.

We used the Taiwanese firms that underwent internationalization as the setting for our empirical analyses for two reasons. First, the home markets of Taiwanese firms are small, and firms operate on a non-economical scale in many industries; therefore, internationalization, for a fraction of these firms, powerfully complements the local market size and enables them to achieve economies of scale (Contractor et al., 2007). Second, Taiwanese firms operate in the context of a high power distance culture. Thus, most of the decision-making activities are centralized in the hands of CEOs. We believe that this is a good setting in which to test hypotheses regarding the effects of CEOs on the internationalization–performance relationship.

Some researchers have suggested that future research concerning top executives and firm internationalization must incorporate longitudinal studies (e.g., Finkelstein & Hambrick, 1996; Herrmann & Datta, 2005). Therefore, we used SMEs listed on the Taiwan Stock Exchange Corporation (TSEC) and the GreTai Securities Market (GTSM) between 2000 and 2006 as our research sample. The financial data were drawn from the Taiwan Economic Journal Data Bank. CEO demographic data were manually collected from company annual reports and *The Manager Directory in Taiwan*, published by the China Credit Information Service. Firms were excluded if complete information on financial data or CEO characteristics were not available. The final sample included 187 companies covering eight industries (food and beverage, plastics, textiles, electric machinery, chemicals and biotechnology, rubber, information and electronics, and other miscellaneous industries). Further, following prior studies on the internationalization of SMEs (e.g., George, Wiklund, & Zahra, 2005; Zahra, Ireland, & Hitt, 2000), we used a three-year lag between the dependent variable and the independent variables because it safeguards against a potential reverse causality and allows time for the internationalization efforts of the SMEs to materialize. Thus, values for the dependent variable covered the years 2003–2009, and those for the independent variables covered the years 2000–2006.

4.2. Measures

4.2.1. Dependent variable

Consistent with the literature on traditional internationalization and firm performance, an accounting-based measure of firm performance (ROA) was used as the dependent variable. We adopted this measure for three reasons. First, to ensure that this research is directly comparable with previous work (e.g., Chao &

Kumar, 2010; Lu & Beamish, 2004; Vermeulen & Barkema, 2002), we used the same dependent variable as previous studies. Second, firm internationalization is associated with the search for economies of scope and scale, and ROA is a good indicator of how well such benefits have been achieved (Kim, Hwang, & Burgers, 1989). Third, in this study, we tested the effect of CEO characteristics (the moderator variable) on internationalization and firm performance. Because managers and external analysts frequently use ROA as a measure of management effectiveness and efficiency (Robins & Wiersema, 1995), we used ROA as our measure of performance to test the hypotheses.

4.3. Independent variables

The degree of internationalization of a firm can be measured in several ways. The dimensions of foreign sales and foreign assets address a firm's dependence on foreign markets and resources (Sanders & Carpenter, 1998). Consistent with prior research (Sambharya, 1996; Sanders & Carpenter, 1998), we used the two popular variables of foreign sales to total sales (FSTS) and foreign assets to total assets (FATA) to capture the scale of internationalization. These two variables were highly correlated ($r = 0.87$, $p < 0.01$). Following the procedures of Sanders and Carpenter (1998), we integrated these two variables into a composite measure of internationalization.

As in prior studies (George et al., 2005; Tallman & Li, 1996), we also used the number of countries in which the firm's foreign subsidiaries operate to measure the degree of internationalization. This variable captures the scope of internationalization and provides an indication of the cultural and institutional variety (Sanders & Carpenter, 1998).

4.4. Moderators

For moderating variables, we selected some of the more common CEO demographic attributes including *CEO age*, *tenure*, *educational level*, *international experience* and *CEO duality*. CEO age was measured as the number of years from the date of birth (Herrmann & Datta, 2002, 2006). CEO tenure was measured as the number of years for which the firm's CEO has been in that position (Herrmann & Datta, 2002, 2006). Similar to past research (Herrmann & Datta, 2002), CEO educational level was measured on a seven-point scale, reflecting the highest level of education attained (1 = elementary school, 2 = junior high school, 3 = high school, 4 = two-year college, 5 = four-year university, 6 = master's degree, 7 = Ph.D. degree). CEO duality was measured using a dummy variable (i.e., 1 if the CEO of the firm is the board chair, 0 if not).

CEO international experience was measured by three international exposure proxies. (1) Experience of working abroad: the CEO has expatriated experience or has worked outside Taiwan in some professional capacity (Herrmann & Datta, 2005; Reuber & Fischer, 1997). (2) International sales experience: the CEO has been responsible for a firm's international market (Herrmann & Datta, 2005; Reuber & Fischer, 1997). (3) International education: the CEO was educated outside Taiwan (Herrmann & Datta, 2002, 2006; Sambharya, 1996). We used these three proxies to gauge the international experience of CEOs and measured it using a dummy variable. These variables were highly correlated. Following Reuber and Fischer (1997), we added them together to form a single measure of CEO international experience.

4.5. Control variables

This study employed several control variables including firm size, debt ratio, R&D intensity, product diversity and sub-industry

effect. First, following prior research (Hitt et al., 1997; Lu & Beamish, 2004), we controlled for firm size through net sales transformed by the natural logarithm. Second, we included debt ratio (total liabilities to assets) as a control. The debt ratio may affect a firm's ability to expand and impact its performance. Third, following prior research (Vermeulen & Barkema, 2002), we controlled for the level of product diversity of a firm. We computed product diversity as a Herfindahl measure. Fourth, we also controlled for R&D intensity (R&D expenditures to net sales), as it has been argued that R&D intensity affects a firm's internationalization and performance (Delios & Beamish, 1999).

To control international complexity, we also controlled institutional and cultural distance. Following Chao and Kumar (2010), we employed the scores for regulative and normative distance previously used by Xu, Pan, and Beamish (2004). Cultural distance was computed by using Kogut and Singh (1988) composite index of culture dimensions and scores (Hofstede, 2001). Finally, we also used industry and year dummy variables to control for all unmeasured industry and performance year effects.

4.6. Analysis

As this study used the panel data to test the hypotheses, the potential heteroskedasticity between panels and the autocorrelation within panels must be taken into account. The generalized least squares (GLS) method is the most appropriate method because it can overcome the problems of cross-sectional heteroskedasticity and within-unit serial correlation (Kmenta, 1986). Consistent with prior research on upper echelons (Herrmann & Datta, 2006) and internationalization and firm performance (Lu & Beamish, 2004), we used the GLS method to test our hypotheses. In this study, some of our variables (e.g., industry dummies) were very stable over time for our sample firms. For this reason, a random-effects approach can be used. Hausman testing revealed no significant correlations between our independent variables and the firm-level fixed effects. Hence, we used random-effects models to test our hypotheses. Additionally, following the recommendation of Aiken and West (1991), all the variables in the moderated regressions were centered by subtracting their mean value to reduce potential multicollinearity problems.

5. Data analysis and results

The descriptive statistics and correlations among the variables included in this study are presented in Table 1. To test further for the effects of multicollinearity, we used ordinary least squares regression to calculate the variance inflation factors (VIF). The highest VIF is 2.3, which is well below the benchmark of 10, suggesting that multicollinearity is not a problem and does not contaminate the analyses.

We tested the five hypotheses using two sets of 7 regressions. Table 2 provides the statistical results of the scale (FSTS/FATA) of internationalization, and Table 3 shows the results of the scope (number of host countries) of internationalization. All models in both Tables 2 and 3 are significant, and each has a reasonable explanatory power. Additionally, only the main variables (i.e., scale vs. scope of internationalization) exhibit different effects on firm performance. All the moderating effects on the relationship between scale and scope of internationalization and firm performance are consistent in Tables 2 and 3. While we discussed the results referencing the models in Table 2, the discussion could also be applied to the models in Table 3.

Regression analyses are performed in a step-wise manner. Model 1 of Table 2 is our baseline model and includes control variables, internationalization, and CEO attributes. The results show that product diversity, international experience and the scale

Table 1
Descriptive statistics and correlations.

	Mean	Standard deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. ROA	0.0533	0.0877	1													
2. FSTS/FATA	0.3189	0.1616	0.149***	1												
3. Number of host countries	2.9949	1.0762	-0.247***	0.114***	1											
4. CEO age	51.2208	6.2946	-0.122***	-0.027	-0.076*	1										
5. CEO tenure	7.3450	6.1787	0.061	0.168***	-0.063	0.121***	1									
6. CEO education	5.1024	1.0530	0.105	0.205	0.189	-0.281***	-0.027	1								
7. CEO international experience	1.2422	0.7462	0.277***	0.185***	-0.053	-0.282***	-0.031	0.373***	1							
8. CEO duality	0.4691	0.4992	-0.069	-0.060	-0.059	0.293***	-0.103	-0.317***	-0.213***	1						
9. Firm size	6.1774	0.3489	0.041	0.140	0.065	0.005	-0.008	0.039	0.010	-0.111***	1					
10. Debt ratio	0.0343	0.0567	0.024	-0.018	-0.027	-0.019	-0.051	0.039	0.051	-0.028	-0.241***	1				
11. R&D intensity	0.3887	0.1695	-0.367***	-0.166***	0.077	-0.045	-0.049	-0.031	-0.199***	0.008	0.093***	-0.259***	1			
12. Product diversity	0.7199	0.4481	0.109***	0.027	0.034	-0.001	0.066	0.044	0.064	0.062	-0.096***	-0.020	-0.040	1		
13. Regulative distance	0.5554	0.1624	-0.109***	0.093	0.155***	-0.082	-0.029	0.039	-0.034	-0.071	0.055*	-0.081	0.041	0.056*	1	
14. Normative distance	0.4438	0.1757	-0.026	-0.019	-0.213***	0.031	0.053	-0.127***	-0.055*	0.040	-0.047	-0.014	0.007	0.056*	0.429***	1
15. Culture distance	1.3064	0.3625	-0.110	0.059	0.170	-0.149***	-0.043	0.032	0.060	-0.089	0.137***	-0.014	0.054	0.004	0.310	0.020

* p < 0.05.
** p < 0.01.
*** p < 0.001.

Table 2
Regression results (scale of internationalization, CEO attributes and ROA).

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	0.0601 (0.0681)	0.0436 (0.0664)	0.0600 (0.0682)	0.0369 (0.0659)	0.0320 (0.0696)	0.0461 (0.0658)	0.0270 (0.0638)
Firm size (log)	0.0096 (0.0097)	0.0126 (0.0094)	0.0096 (0.0097)	0.0125 (0.0093)	0.0144 (0.0093)	0.0119 (0.0093)	0.0151* (0.0090)
R&D intensity	-0.0716 (0.0550)	-0.0739 (0.0535)	-0.0716 (0.0550)	-0.0846 (0.0531)	-0.0597 (0.0528)	-0.0860 (0.0531)	-0.0837 (0.0512)
Debt ratio	-0.1261*** (0.0162)	-0.1256*** (0.0159)	-0.1261*** (0.0163)	-0.1232*** (0.0158)	-0.1158*** (0.0160)	-0.1270*** (0.0158)	-0.1219*** (0.0155)
Product diversity	0.0191** (0.0061)	0.0190** (0.0060)	0.0191** (0.0061)	0.0193** (0.0059)	0.0194** (0.0059)	0.0172** (0.0059)	0.0182** (0.0057)
Regulative distance	-0.0282* (0.0143)	-0.0313* (0.0141)	-0.0282* (0.0143)	-0.0312* (0.0140)	-0.0357* (0.0141)	-0.0326* (0.0140)	-0.0358** (0.0138)
Normative distance	-0.0038 (0.0139)	-0.0071 (0.0137)	-0.0038 (0.0139)	-0.0028 (0.0136)	-0.0006 (0.0137)	-0.0039 (0.0135)	-0.0035 (0.0134)
Culture distance	-0.0115* (0.0057)	-0.0108* (0.0056)	-0.0115* (0.0057)	-0.0130* (0.0056)	-0.0134* (0.0056)	-0.0108* (0.0056)	-0.0123* (0.0055)
FSTS/FATA	0.0737*** (0.0188)	0.0686** (0.0183)	0.0737*** (0.0189)	0.0509** (0.0184)	0.0592** (0.0181)	0.0661** (0.0182)	0.0507** (0.0178)
CEO age	-0.0008* (0.0003)	-0.0007* (0.0003)	-0.0008 (0.0003)	-0.0006* (0.0003)	-0.0008* (0.0003)	-0.0007* (0.0003)	-0.0006* (0.0003)
CEO tenure	0.0006 (0.0004)	0.0005 (0.0004)	0.0006 (0.0004)	0.0005 (0.0004)	0.0004 (0.0004)	0.0005 (0.0004)	0.0005 (0.0004)
CEO education level	0.0014 (0.0022)	0.0009 (0.0022)	0.0014 (0.0022)	0.0033 (0.0022)	0.0004 (0.0022)	0.0021 (0.0022)	0.0021 (0.0022)
CEO international experience	0.0138*** (0.0030)	0.0132*** (0.0030)	0.0138*** (0.0030)	0.0110*** (0.0030)	0.0136*** (0.0030)	0.0113*** (0.0030)	0.0107*** (0.0030)
CEO duality	-0.0065 (0.0045)	-0.0062 (0.0044)	-0.0065 (0.0045)	-0.0066 (0.0044)	-0.0043 (0.0044)	-0.0073 (0.0044)	-0.0060 (0.0044)
FSTS/FATA × CEO age		-0.0102*** (0.0017)					-0.0038* (0.0018)
FSTS/FATA × CEO tenure			-0.0000 (0.0023)				0.0001 (0.0022)
FSTS/FATA × CEO educational level				0.0904*** (0.0123)			0.0403** (0.0145)
FSTS/FATA × CEO internationalization experience					0.1111*** (0.0170)		0.0478* (0.0191)
FSTS/FATA × CEO duality						-0.2055*** (0.0246)	-0.1248*** (0.0290)
σ_{μ}	0.0030	0.0030	0.0030	0.0029	0.0030	0.0029	0.0029
σ_e	0.0019	0.0018	0.0019	0.0017	0.0016	0.0017	0.0015
ρ	0.3890	0.3700	0.3890	0.3660	0.3540	0.3680	0.3360
DW	1.4464	1.4478	1.4464	1.4459	1.4378	1.4582	1.4411
Adjusted R^2	0.1834	0.2090	0.1827	0.2198	0.2142	0.2282	0.2508
F value	10.0677***	11.5307***	9.7550***	12.0321***	11.8079***	12.5673***	12.6899***

Notes: This study controlled for industry and year with dummy variables, but their results are omitted in the table for presentation sake. Values in the parentheses are standard errors.

* $p < 0.10$.

** $p < 0.05$.

*** $p < 0.01$.

**** $p < 0.001$.

of internationalization (FSTS/FATA) has a significant positive relationship with firm performance. Debt ratio, regulation distance, culture distance and CEO age have a significant negative relationship with firm performance. The results also show that the textile industry and the rubber industry have a negative relationship with firm performance.

Additionally, in this study, we use both the scale (FSTS/FATA) and scope (number of countries) of foreign operations at the same time to measure the degree of internationalization. Our results show different internationalization effects on firm performance. The scale of internationalization is related to firm performance positively and significantly (Model 1 of Table 2), but the relationship between the scope of internationalization and firm performance is an inverted U-shape (Model 1 of Table 3). Accordingly, this result may imply that in a small domestic market, expanding foreign markets and accessing foreign resources may help SMEs to realize economies of scale and reduce input costs; however, international expansion across many countries may have a positive effect in the initial stage, but after

a certain point, any further expansion into different countries leads to a decline in performance.

The different findings on the performance effect of the internationalization scale and the internationalization scope are worth noting. Large scale internationalization does not necessarily equate to large scope internationalization. In other words, firms may choose to either concentrate their foreign presence in a few selected countries or spread their operation over many countries. We analyzed our sample and found that the country coverage in our sample varied from one to nine, with 64% of the firms operating in three or fewer countries. Most of these Taiwanese SMEs entered familiar countries, such as China or countries of Southeast Asia, for raw materials and low labor costs. This intra-regional diversification allows these SMEs to more readily build and integrate different resources and consequently increase firm performance (Qian, Khoury, Peng, & Qian, 2010). However, when expanding into different regional countries, SMEs face dissimilar country profiles, making it more difficult to understand the operations and to respond appropriately to local demands. Therefore, the

Table 3
Regression results (scope of internationalization, CEO attributes and ROA).

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	-0.0115 (0.0698)	0.0033 (0.0651)	-0.0172 (0.0657)	-0.0267 (0.0646)	-0.0176 (0.0656)	-0.0116 (0.0642)	-0.0085 (0.0637)
Firm size (log)	0.0214* (0.0092)	0.0187* (0.0091)	0.0211* (0.0092)	0.0211* (0.0090)	0.0201* (0.0092)	0.0206* (0.0089)	0.0197* (0.0089)
R&D intensity	-0.0513 (0.0524)	-0.0450 (0.0516)	-0.0519 (0.0523)	-0.0406 (0.0513)	-0.0426 (0.0523)	-0.0461 (0.0509)	-0.0320 (0.0504)
Debt ratio	-0.1195*** (0.0152)	-0.1161*** (0.0150)	-0.1211*** (0.0151)	-0.1198*** (0.0149)	-0.1173*** (0.0151)	-0.1206*** (0.0148)	-0.1169*** (0.0147)
Product diversity	0.0192*** (0.0058)	0.0182*** (0.0057)	0.0194** (0.0058)	0.0185** (0.0057)	0.0184** (0.0058)	0.0187*** (0.0056)	0.0179** (0.0056)
Regulative distance	0.0035 (0.0133)	0.0055 (0.0131)	0.0059 (0.0132)	0.0058 (0.0131)	0.0086 (0.0132)	0.0070 (0.0131)	0.0091 (0.0130)
Normative distance	-0.0145 (0.0133)	-0.0149 (0.0131)	-0.0167 (0.0132)	-0.0165 (0.0131)	-0.0159 (0.0132)	-0.0176 (0.0131)	-0.0173 (0.0130)
Culture distance	-0.0080 (0.0052)	-0.0085 (0.0052)	-0.0080 (0.0052)	-0.0083 (0.0052)	-0.0087+ (0.0052)	-0.0085 (0.0052)	-0.0092+ (0.0051)
Number of host countries	0.0169* (0.0080)	0.0205** (0.0078)	0.0171** (0.0079)	0.0236** (0.0080)	0.0163* (0.0079)	0.0176* (0.0078)	0.0220** (0.0080)
Number of host countries squared	-0.0079*** (0.0012)	-0.0085*** (0.0012)	-0.0080*** (0.0012)	-0.0089*** (0.0012)	-0.0077*** (0.0012)	-0.0079*** (0.0012)	-0.0085*** (0.0012)
CEO age	-0.0010* (0.0003)	-0.0012*** (0.0003)	-0.0010** (0.0003)	-0.0011*** (0.0003)	-0.0009* (0.0003)	-0.0011*** (0.0003)	-0.0012*** (0.0003)
CEO tenure	0.0009* (0.0003)	0.0007* (0.0003)	0.0008* (0.0003)	0.0008* (0.0003)	0.0008* (0.0003)	0.0008* (0.0003)	0.0007* (0.0003)
CEO education level	0.0049* (0.0021)	0.0051* (0.0020)	0.0049** (0.0020)	0.0053** (0.0020)	0.0054** (0.0020)	0.0053** (0.0020)	0.0056** (0.0020)
CEO international experience	0.0088** (0.0028)	0.0086** (0.0028)	0.0092*** (0.0028)	0.0094** (0.0028)	0.0085** (0.0028)	0.0091** (0.0028)	0.0090** (0.0028)
CEO duality	-0.0029 (0.0041)	-0.0037 (0.0041)	-0.0030 (0.0041)	-0.0033 (0.0041)	-0.0029 (0.0041)	-0.0032 (0.0041)	-0.0039 (0.0041)
Number of host countries × CEO age		-0.0012*** (0.0003)					-0.0008** (0.0003)
Number of host countries × CEO tenure			-0.0003 (0.0003)				-0.0003 (0.0003)
Number of host countries × CEO educational level				0.0066*** (0.0016)			0.0032+ (0.0018)
Number of host countries × CEO internationalization experience					0.0083*** (0.0023)		0.0040+ (0.0024)
Number of host countries × CEO duality						-0.0144*** (0.0032)	-0.0080* (0.0035)
σ_μ	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0024
σ_e	0.0020	0.0019	0.0020	0.0018	0.0020	0.0017	0.0014
ρ	0.4430	0.4340	0.4420	0.4240	0.4450	0.4150	0.3650
DW	1.5089	1.5033	1.5073	1.5054	1.5038	1.4911	1.4765
Adjusted R ²	0.2947	0.3082	0.2966	0.3062	0.3029	0.3085	0.3183
F value	17.5602***	17.9708***	17.0781***	17.8271***	17.5707***	18.0041***	19.2251***

Notes: This study controlled for industry and year with dummy variables, but their results are omitted in the table for presentation sake. Values in the parentheses are standard errors.

+ $p < 0.10$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

incremental costs of further international expansion would be greater than the incremental benefits. Such findings are consistent with Geringer, Beamish, and daCosta's (1989) argument that while the increased scope may initially improve performance, the performance declines over time.

To examine the impact of CEO characteristics on the relationship between internationalization and firm performance, a moderated multiple analysis is conducted. Hypothesis 1 predicts that CEO age has a negative moderating impact on the relationship between internationalization and firm performance. As shown in Model 2 of Table 2, the interaction of internationalization and CEO age is significantly negative. This suggests that the internationalization–performance relationship becomes weaker as the age of the CEO increases. Hence, Hypothesis 1 is strongly supported. This phenomenon may indicate that older CEOs, who are more risk-averse, possess less physical and mental stamina, have inferior information processing and analysis capabilities, and are less likely

to identify potential opportunities in the firm's international activities and to solve the complex problems associated with internationalization. These characteristics may consequently impair the firm's internationalization performance.

Although the finding of a negative moderating effect of age on the internationalization–performance relationship suggests that younger CEOs may be superior to older CEOs with respect to internationalization performance, it is possible that there may be a lower age limit. CEO age is usually correlated with their total work experience, organizational tenure and industry knowledge (Tyler & Steensma, 1998) that consequently may increase their capabilities in information processing. In our sample, the minimum age of CEOs is 36 and 90% of the CEOs are older than 40, suggesting that CEOs may have comprehensive knowledge and experience to deal with international operations. Accordingly, the issue of younger CEOs who lack work experience and knowledge may not be relevant in this study.

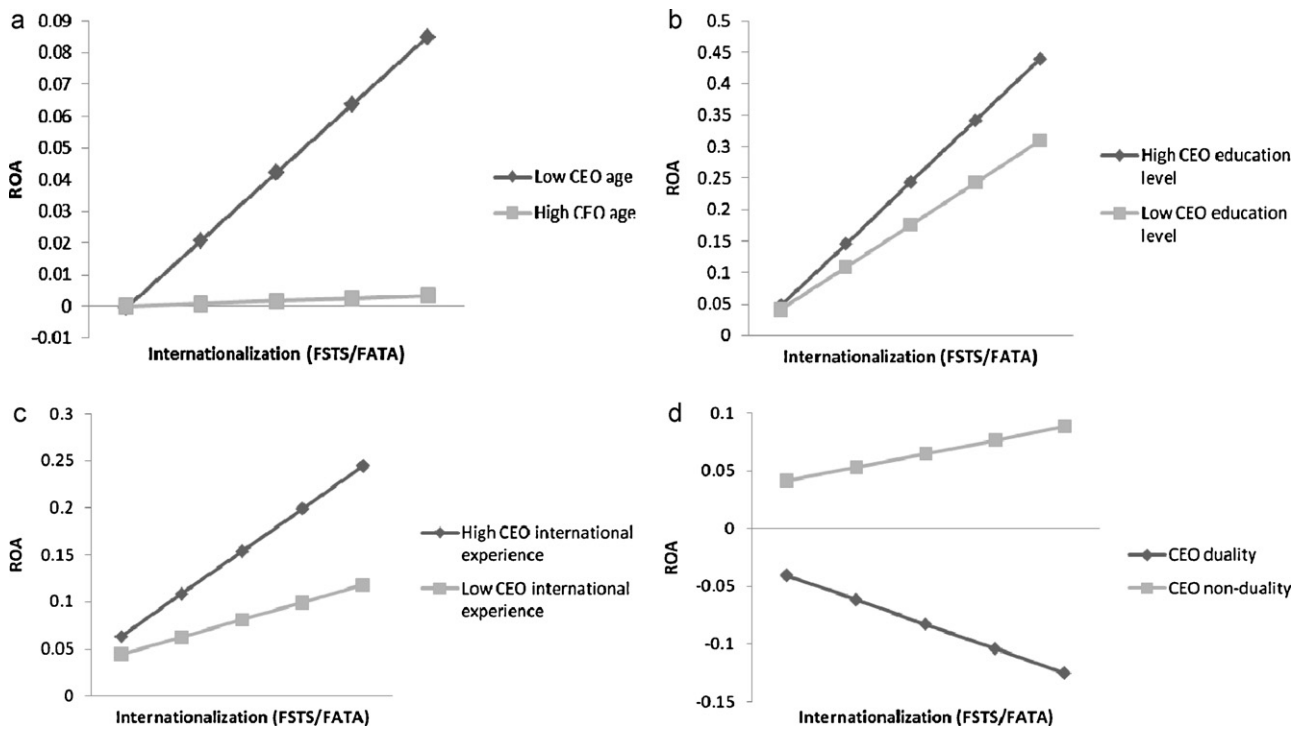


Fig. 1. Interaction plot for the moderating effect of (a) CEO age, (b) CEO education level, (c) CEO international experience, and (d) CEO duality on the relationship between internationalization (FSTS/FATA) and performance.

Model 3 of Table 2 demonstrates that the interaction of internationalization with CEO tenure is negative but not significant (Hypothesis 2 was not supported). One possible explanation for this result may be that, as tenure increases, a CEO may lose touch with their organizational environment and thus develop a narrower perspective and a limited knowledge base, which may be detrimental to the firm's internationalization performance. However, at the same time, long tenure may be associated with organizational familiarity, which can reduce the intrafirm communication cost. Therefore, in light of the observation of a negative and insignificant moderating effect of CEO tenure, the disadvantages of long tenure appear to outweigh the advantages, but not with a great enough effect to be significant.

Hypothesis 3 predicts that the educational level of the CEO has a positive moderating impact on the relationship between internationalization and firm performance. Model 4 of Table 2 indicates that the interaction of internationalization with the educational level of the CEO is significantly positive. This result lends support to Hypothesis 3 and suggests that the internationalization–performance relationship becomes stronger when the CEO as an increased level of education. This phenomenon may imply that CEOs educated to a greater degree are more likely to tolerate ambiguity and take risks. Their advanced knowledge and greater cognitive ability may enhance their information processing and analysis abilities. Therefore, they are quietly confident and better equipped to effectively handle the complex problems associated with international operations, subsequently improving the firm's internationalization performance.

Model 5 of Table 2 demonstrates that the interaction of internationalization with CEO international experience is significantly positive. This result lends support to Hypothesis 4 and suggests that the internationalization–performance relationship is strengthened when a CEO possesses greater international experience. This phenomenon implies that international experience may provide executives with valuable experience, market knowledge and confidence. These enable them to deal effectively with the

uncertainties and ambiguities associated with internationalization and to interact well with local governments and suppliers, which may enhance the internationalization performance.

Model 6 of Table 2 indicates that the interaction of internationalization with CEO duality is significantly negative, lending support to Hypothesis 5. It suggests that the internationalization–performance relationship becomes weaker when a firm's CEO also serves as chair of the board. This phenomenon indicates that duality may result in some CEOs governing their firms without input from others, which may limit the type and quality of information the CEO receives about the international operations of the firm. Additionally, the excessive centralization associated with duality may obstruct a firm's ability to deal properly with the international dispersive activities necessary for effective internationalization implementation. These two factors may, as a result, impair a firm's internationalization performance. Finally, Model 7 of Table 2 shows that the results are qualitatively identical if the five interaction terms are all included simultaneously.

To obtain a clearer view of the nature of the interactions, we plotted the interaction terms using the steps suggested by Aiken and West (1991) (Fig. 1a–d). Confirming the hypothesized moderating effects, the slopes of the regression lines in these four graphs vary significantly as the Z-values vary (mean plus/minus one standard deviation). Simple slope analyses further indicate that internationalization has a strong positive association with a firm's performance when the CEO of the firm is young, is highly educated and has international experience and when the firm prohibits the CEO from also serving as chair of the board.

6. Discussion and conclusion

6.1. Discussion

Internationalization is recognized as an increasingly necessary and valuable strategy, especially for SMEs operating in a limited domestic market such as Taiwan. Prior research has identified

numerous constraints faced by SMEs in international expansion (e.g., Cullen & Parboteeah, 2008; Lu & Beamish, 2001; Pangarkar, 2008). Specifically, Karagozoglu and Lindell (1998) find that managerial expertise and competence and the lack of information are the top two challenges faced by small firms in internationalization. Accordingly, this study examines CEO attributes by focusing on how their information processing capabilities impact the internationalization performance of SMEs. The results indicate that there may be a positive relationship between CEOs who are more educated and/or possess greater international experience and better internationalization performance. On the other hand, older CEOs and CEO duality may be detrimental to internationalization performance. Therefore, if we want to fully understand the performance differences of internationalized SMEs, the characteristics of their CEOs must be considered.

Following Roth's (1995) argument that the information processing capability of the CEO plays an important role during the internationalization of a SME, this study reveals that differences in CEO attributes may result in varying performances, even in two firms with the same level of internationalization. These managerial capabilities are critical because the capacity of CEOs to deal with complex situations is constrained owing to their bounded rationality and cognitive limitations. CEOs who overstrain their information processing capability are more likely to devote suboptimal time and attention to scanning the international environment, to integrating new subsidiaries into the internal network, and to nurturing their role within the international operations. As a result, the contribution of international expansion to a firm's performance is limited.

Our research has two theoretical contributions. First, in studies of firms' internationalization–performance relationships, researchers suggest that the characteristics of top executives are an important contextual factor that may influence a firm's internationalization performance (Hennart, 2007; Hitt et al., 1997; Vermeulen & Barkema, 2002); however, this issue is not well-documented. We aim to fill this gap in the literature by integrating CEO characteristics into the internationalization–performance relationship, which may allow us to gain a clear understanding of how this relationship may be influenced or constrained by CEO demographic attributes. Second, we use the theory of upper echelons in the internationalization–performance model. Past researchers (Herrmann & Datta, 2002, 2006; Tihanyi et al., 2000) have used this theory to explain a firm's international behavior, but few studies have examined the internationalization–performance relationship based on this theory. By extending the upper echelons theory and incorporating the information processing theory, we show that the benefit that firms can gain from internationalization depends on their information processing capability.

This paper also extends the internationalization–performance literature with empirical tests of SMEs in newly industrialized economies (NIEs). The home markets of NIE firms are small when compared to advanced economies. Expanding foreign sales enables NIE firms to achieve economies of scale and enhance firm performance. However, as SMEs expand into many dissimilar markets, higher levels of geographic scope may greatly increase managerial information-processing demands, making the organization more complex and difficult to manage (Roth, 1995). Because SMEs have limited internal resources and managerial capability, a moderate level of country scope, relative to comparatively higher and lower levels, may yield better performance.

6.2. Managerial relevance

The findings in this paper have important implications for practice. First, firms facing greater internationalization are increasingly coming to the realization that they need managers

who have the attributes (e.g., a tolerance for ambiguity) and skill sets (e.g., a greater information processing capability) that enable them to function effectively in the more complex international environment. In internationalizing firms, CEOs are required to deal with large amounts of diverse and conflicting information, and the ability to do so is likely both valuable and rare. McGaffey and Christy (1975) propose that managers adapt to the information demands necessitated by their firms, meaning that managers who operate businesses that are undergoing rapid growth must increase their personal capability to process the data generated because of the increasing complexity in their business.

Second, the observed moderating effects of CEO characteristics provide some important implications for the career planning of other managers. To managers aspiring to become CEOs, the findings in this study highlight the benefits of matching their characteristics to a firm's internationalization strategy. In other words, managers must recognize that enhancing certain personal characteristics, such as their international experience and their educational level, may prove valuable for their future career. For instance, managers should perhaps consider accepting international expatriate tasks or mobilizing to different subsidiaries as this international exposure may increase their cross-cultural understanding and, consequently, enhance their information processing capability.

Finally, as the CEO is often the central decision-maker in a firm, it is important that boards consider a candidate's demographic traits when selecting and developing suitable people for the position of CEO. For instance, according to the findings of the positive moderating effects of educational level and international experience of the CEO and the negative effect of the age of the CEO, the board of a firm undertaking internationalization activities may consider selecting a CEO who is younger, more highly educated, and who has more international experience to achieve greater profitability. Additionally, the finding of a negative moderating effect of CEO duality suggests that shareholders who possess ownership as well as voting rights may want to seriously consider refusing to nominate the chair of the board as the CEO, as the presence of non-duality may improve internationalization performance.

6.3. Limitations and directions for future research

This paper has several limitations, thereby providing opportunities for further research. First, the study sample is constrained to the unique context of SMEs in Taiwan. Additionally, some CEO attributes may have cultural roots. For example, age is valued more highly in Taiwan. Farh, Tsui, Xin, and Cheng (1998) find that Chinese people tend to equate age with knowledge, and therefore, they tend to respect elder executives. As a result, the findings may not be generalizable to firms in other countries.

Second, this study only focuses on the influence of CEO attributes on the relationship between internationalization and firm performance. Roth (1995, p. 226) notes that “the other members of the firm's dominant coalition will have characteristics that would compensate for a CEO's limitations”. Therefore, these members and their influence should be examined in future research. Third, information processing theory has been applied at the individual and organizational levels of analysis. As previously mentioned, this study focuses on individual CEOs, and future research could incorporate organization-level information processing functions into the model, such as organizational structure, processes, and delegation mechanisms. Fourth, from the perspective of the three-stage theory, analogous investigations replicating this research should be conducted in testing the moderating effects of CEO attributes on the internationalization–performance relationship in different stages.

Finally, due to the difficulty in collecting firms' internationalization data and CEO demographic traits (e.g., the length of CEO international experience), we were not able to collect more longitudinal data. Future studies could expand this line of research by employing alternative research designs and data-collection methods to secure more complete and in-depth data regarding managerial attributes for analysis.

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