

Entrepreneurial Orientation, Learning Orientation, and Firm Performance

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ABSTRACT

Entrepreneurial orientation (EO) is a key ingredient for firm success. Nonetheless, an important message from past findings is that simply examining the direct effect of EO on firm performance provides an incomplete picture. Prior studies examined various internal and external factors that influence the EO-performance relationship. However, learning orientation (LO) has been a missing link in the examination of the relationship. Using data from 213 medium-to-large UK firms, this study finds that LO mediates the EO-performance relationship, and the EO-LO-performance link is stronger for prospectors than analyzers. The findings indicate that LO must be in place to maximize the effect of EO on performance, and that LO is an important dimension, along with EO, to distinguish prospectors from analyzers.

INTRODUCTION

Entrepreneurial orientation (EO) refers to “the processes, practices, and decision-making activities that lead to new entry” (Lumpkin and Dess, 1996, p.136). EO is revealed through firm-level characteristics as summarized by Miller (1983, p.771): “An entrepreneurial firm is one that engages in product-market innovation, undertakes somewhat risky ventures, and is first to come up with ‘proactive’ innovations, beating competitors to the punch.” Such characteristics are associated with improved firm performance in today’s business environments where product and business model life cycles are shortened (Hamel, 2000), and where the future profit streams from existing operations are uncertain and businesses need to constantly seek out new opportunities (Wiklund and Shepherd, 2005). Several studies have found that firms demonstrating more entrepreneurial strategic orientation perform better (Wiklund, 1999; Zahra, 1991; Zahra and Covin, 1995). However, Smart and Conant (1994) did not find a significant EO-performance relationship, and Hart (1992) argued that a firm’s entrepreneurial strategy-making mode may even lead to poor performance under certain circumstances.

An important message from past findings is that simply examining the direct EO-performance relationship provides an incomplete picture of performance (Lumpkin and Dess, 1996; Wiklund and Shepherd, 2005). This urges future research to control internal and external contingent factors in the examination of the EO-performance relationship (Wiklund, 1999; Wiklund and Shepherd, 2003, 2005; Rauch et al., 2004; Walter et al., 2005; Covin et al., 2006). Neglecting these contingent factors will lead to the ‘wholesale adoption’ of an entrepreneurial strategic orientation (Wiklund, 1999), and forsake firms’ entrepreneurial efforts. Recent studies have found that the effect of EO on performance is influenced by firm size, national culture (Rauch et al., 2004), access to financial resources (Wiklund and Shepherd, 2005), network capability (Walter et al., 2005), and strategic processes (Covin et al., 2006). Nevertheless, thus far, a firm’s learning orientation has been a missing link in the examination of the EO-performance relationship.

Sinkula et al. (1997) conceptualize learning orientation (LO) as a firm’s values (i.e. commitment to learning, open-mindedness, and shared vision) that influence its propensity to create and use knowledge. Such values guide a firm’s behavior and processes of acquiring diverse information, developing common understanding of information acquired, and generating new knowledge or organizational insights (Fiol

and Lyles, 1985). A learning organization bears an explicit focus on the acquisition of knowledge that is potentially useful for the organization (Harrison and Leitch, 2005) in order to refine existing knowledge and routines (i.e. adaptive learning) or to question long-held assumptions and develop a new way of thinking (i.e. generative learning) (Slater and Narver, 1995). Learning orientation underpins firms' internal self-renewal, and is an important aspect of firms' strategizing activities (Covin et al., 2006). Covin et al. (2006) reckon that the strategizing activities that organizational learning entails - how firms choose, learn from, and refine or redefine their major business-related decisions and the patterns they assume - are critical to maximize the effect of the EO on firm performance.

This study builds on the existing body of work and, more specifically, conceptualizes LO as a mediator of the EO-performance relationship. Entrepreneurial firms constantly face complex and turbulent external environments (Lumpkin and Dess, 1996) that are fertile for new information and knowledge and hence provide a context that is conducive to information acquisition and dissemination. The more entrepreneurial a firm is, the more proactively and extensively it engages in environmental scanning (Miles and Snow, 1978; Daft and Weick, 1984), and the greater extent to which it is involved in information acquisition and dissemination (Huber, 1991; Sinkula, 1994). Furthermore, entrepreneurial firms are innovative and risk-tolerant, and therefore provide the internal environment in which learning through exploration and experimentation is most likely to take place (Hamel and Prahalad, 1991; Slater and Narver, 1995). However, to reap the benefits of entrepreneurial efforts, a firm must be committed to learning, open-minded to new information and new ways of doing things, and most importantly engage in shared interpretation of information where a consensus on the meaning of the information is achieved (Sinkula, 1994; Slater and Narver, 1995). Hence, it is through LO that a firm maximizes the impact of EO on firm performance.

The objective of this study is to evaluate the EO-LO-performance relationship, drawing on data collected from 213 medium-to-large UK firms. This study seeks to contribute to the EO-performance literature by incorporating LO as a mediator and firm strategy as a moderator. More specifically, the first research question lies in: Is the EO-performance relationship mediated by LO in medium-to-large firms? By addressing this question, this study aims to cross-fertilize entrepreneurship and organizational learning literature - an under-researched area in which Deakins (1999, p.23) called for further studies: "our limited knowledge and understanding of the interaction of learning and the entrepreneurial process remains one of the most neglected areas of entrepreneurial research, and thus, understanding." Harrison and Leitch (2005) most recently renew the call for cross-fertilization of the entrepreneurship and organizational learning literature in the 2005 Special Issue of Entrepreneurship Theory and Practice. Furthermore, this study tests whether the links of the EO-LO-performance vary in strength across Miles and Snow's (1978) strategy types, given that all four strategy types need to deal with an 'entrepreneurial problem'. Therefore, the second research question is: Does a firm's strategy type moderate the EO-LO-performance relationship?

THEORETICAL FRAMEWORK AND HYPOTHESES

Conceptualization of EO and LO

The conceptualization of EO has been the focus of systematic inquiry in the literature (e.g. Lumpkin and Dess, 1996; Lyon et al., 2000; Covin et al., 2006), and several key dimensions of the construct have emerged. Miller (1983) suggested that a

firm's degree of entrepreneurship is the extent to which it innovates, acts proactively, and takes risks. Lumpkin and Dess (1996) suggest that proactiveness and aggressiveness are, indeed, distinct dimensions albeit closely allied to each other. Proactiveness refers to how firms relate to market opportunities in the process of new entry, and seize such opportunities in order to shape the environment, while aggressiveness refers to how firms relate to the competition and respond to trends and demands that already exist in the marketplace. Given the existing conceptual insights, a continued theoretical debate is beyond the focus of this study. Instead, this study adopts the four dimensions of EO as market proactiveness, competitive aggressiveness, firm risk-taking, and firm innovativeness.

Market proactiveness refers to the extent to which a firm anticipates and acts on future needs (Miller and Friesen, 1978; Lumpkin and Dess, 1996) by "seeking new opportunities which may or may not be related to the present line of operations, introduction of new products and brands ahead of competition, strategically eliminating operations which are in the mature or declining stages of life cycle" (Venkatraman, 1989, p.949). This definition overlaps with Miller's (1983) conceptualization of innovativeness that also bears an explicit focus on product-market. For the purpose of conceptual distinction, this study considers the introduction of new products and services to capitalize on market opportunities as an element of market proactiveness, and defines innovativeness as "a firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes" (Lumpkin and Dess, 1996, p.142). Innovative firms are those that exhibit innovative behavior consistently over time. Competitive aggressiveness refers to "a firm's propensity to directly and intensely challenge its competitors to achieve entry or improve position, that is, to outperform industry rivals in the marketplace" (Lumpkin and Dess, 1996, p.148). Firm risk-taking refers to "the degree to which managers are willing to make large and risky resource commitments – i.e. those which have a reasonable chance of costly failures" (Miller and Friesen, 1978, p.923). Risk-taking is an important dimension of EO as entrepreneurial firms tend to experience a higher level of external and internal uncertainty.

The conceptualization of LO exhibits two focuses: some scholars emphasize concrete information generation and dissemination systems as the mechanism through which learning takes place (Huber, 1991), while others consider firms as 'cognitive enterprises' and call for the need for a shared mental model, a shared organizational visions, and an open-minded approach to problem solving (Senge, 1990). Organizational learning is referred to as knowledge acquisition in the former view, and value acquisition in the latter (Sinkula et al., 1997). However, these two views must not be examined in isolation. A firm's implicit or explicit understanding of how things should be done (i.e. the theory in use) reflects its underlying values and norms, and influences its action – "organizational learning occurs when members of the organization act as learning agents for the organization, responding to changes in the internal and external environment of the organization by detecting and correcting errors in the organizational theory in use, and embedding the results of their inquiry in the private images and shared maps of organization" (Argyris and Schön, 1978, p.23). Hence, a firm's values and its behavior and processes associated with organizational learning are intrinsically linked: learning-oriented values are manifested in a firm's behavior and processes of knowledge acquisition, creation and transfer (Garvin, 1993); and as firms modify its behavior to reflect new knowledge and insights (Garvin, 1993), existing values and norms are challenges, and new values are instilled. Sinkula et al. (1997, p.314) reckon that organizations may learn "actively or passively, by their own volition or through force, as a luxury or by necessity, through systematic analysis or by trial and error, and

through long-term versus short-term feedback from a dynamic or stable environment". In other words, there is no "one way" that firms learn, and the paths and processes involved in learning may differ among firms. Therefore, Sinkula et al. (1997) do not propose "the model" of organizational learning and, instead, propose that the quality and efficiency at which a firm learns is a function of its core values.

This study takes Sinkula et al.'s (1997) view that the organizational values that influence a firm's learning propensity are fundamental when examining a firm's overall LO. In particular, three values are identified as salient. First, commitment to learning refers to the extent to which a firm places value on learning (Sackmann, 1991). It is related to Senge's (1990) learning principles that call for organizations to place axiomatic value on learning activities, in other words, firms must develop the ability to think and reason (Tobin, 1993), and to value the need to understand the causes and effects of their actions (Shaw and Perkins, 1991). Second, open-mindedness refers to the extent to which a firm proactively questions long-held routines, assumptions, and beliefs (Sinkula et al., 1997), and is linked to the notion of 'unlearning' (Nystrom and Starbuck, 1984). Firms learn from their past successes and failures, and such information is processed and embedded in their mental models that influence the way of thinking and acting. These mental models may no longer hold true when the external environment has changed (Day, 1994), and firms must proactively question their mental models and engage in unlearning (Sinkula et al., 1997). Third, shared vision refers to the extent to which a firm develops and holds a universally understood organizational focus (Day, 1994), and gives organizational members a sense of purpose and direction (Baker and Sinkula, 1999). A shared vision provides individuals, as learning agents, the organizational expectations, outcomes to be measured, and theories in use. Individuals that are open-minded and committed to learning are motivated to learn, but may find it difficult to know what to learn unless a shared vision is in place (Sinkula et al., 1997).

The three identified organizational values underpin two types of organizational learning: adaptive and generative learning (Senge, 1990). Adaptive learning occurs within a set of recognized and unrecognized organizational constraints (i.e. assumptions about its environment and itself), and hence entails sequential and incremental learning within the traditional scope of organizational activities (Slater and Narver, 1995). The paradox is that a firm's dominant logic can be an effective guide for the development of core capabilities, but left unquestioned, may become obsolete and irrelevant over time (Leonard-Barton, 1992). Hamel and Prahalad (1991, p.83) describe this as the 'tyranny of the served market' where narrow business definitions impede the innovative search for unconventional business opportunities. For frame-breaking learning to occur, a firm must be willing to question long-held assumptions about its mission, customers, capabilities, or strategy – this is referred to as generative learning that, in turn, requires fundamental understanding of the underlying cause-effect relationship between the environment and the firm (Slater and Narver, 1995). Thus, generative learning is characterized as creativity, breakthrough, and organizational unlearning. The different natures of adaptive and generative learning indicate that for a higher-order generative learning to occur, a firm needs to challenge its existing mental model and reaches beyond the learning boundary for information or new ways of interpreting information (Slater and Narver, 1995). Conversely, adaptive learning reflects a firm's propensity to behave in a 'conservative' manner (Sadler-Smith et al., 2001). Therefore, Sinkula et al. (1997) essentially argue that generative learning, relative to adaptive learning, requires that a firm demonstrate a higher degree of commitment to learning, open-mindedness, and shared vision.

EO, LO, and Firm Performance

The EO-performance literature is long-standing, and empirical studies have largely found that firms with a more EO perform better (Zahra, 1991; Zahra and Covin, 1995; Wiklund, 1999). Most recently, Rauch et al. (2004) based on a meta-analysis of 37 studies conclude that the EO-performance relationship is moderately large and that firms benefit from EO. On the other hand, the organizational learning literature bears a performance-oriented focus: a firm's ability to extract lessons from both successes and failures and generate new insights is conducive to performance (Fiol and Lyles, 1985; Senge, 1990; Sinkula, 1994). Therefore, organizational learning is considered by many scholars as the key to firm success, and the ability to learn faster than competitors may be the only source of sustainable competitive advantage (Dickson, 1992). Sadler-Smith et al. (2001) note that there is descriptive evidence that the nuclear industry, British Petroleum, financial services, and the automotive industry experienced the 'power of learning', and those who learnt quickest won the competitive 'race'. Empirical findings also support that LO has a significant positive impact on performance (Baker and Sinkula, 1999; Farrell, 2000). It is, therefore, clear that EO and LO have positive effects on performance, respectively. However, the EO-LO- performance relationship remains under researched.

Understanding the EO-LO-performance relationship in medium-to-large firms is particularly important for several reasons. First, early research largely focuses on individual entrepreneurs' experiential learning as an evolving process in entrepreneurial start-up and growth (Smilor, 1997; Reuber and Fischer, 1999; Cope, 2005). The rise of interest in corporate entrepreneurship, whilst recognizing the role of any number of actors inside or outside the firm (Wiklund, 1999), draws attention to firms as collective entities and requires better understanding of how firms learn and engage in entrepreneurial activities in view of improved performance. Second, whilst a large body of work has heretofore examined the interface of entrepreneurship and learning in the process of new venture creation (e.g. Erikson, 2003), scholars have called for better understanding of the learning process within existing entrepreneurial firms (Cope, 2005). The higher failure rate in the first years of business start-up highlights the importance of continuous learning. As firms grow larger, organizational learning plays a crucial role in updating their resources and capabilities in line with the internal and external demand. Organizational learning is a continuous process throughout the life of a firm, rather than just being concentrated in the first few years (Reuber and Fischer, 1999), and plays an important role in the entrepreneurial process in large, more established firms (Schildt et al., 2005). Within the context of medium-to-large firms, this study delineates the mediating role of LO in the EO-performance relationship below.

First, entrepreneurial firms are risk-tolerant and innovative. Such characteristics often stimulate firms to eliminate the kind of traditional authoritarian, hierarchical structures (particularly in medium-to-large firms) that inhibit collaborative learning (Zahra et al., 1999; Kuratko et al., 2001). Entrepreneurial firms instill flexibility, and grant individuals and team the freedom to exercise their creativity and champion promising ideas (Lumpkin and Dess, 1996). Individuals are motivated and inspired to learn in such environments and tend to demonstrate a higher level of commitment to learning (Drucker, 1999). A risk-tolerant and innovative orientation also means that managers within the firm encourage new ways of thinking, tolerate mistakes, and reward new ideas that contribute to innovation and business improvement (Miller and Friesen, 1983). This promotes a sense of open-mindedness since individuals are neither constrained within a frame of thinking nor punished for making mistakes. Furthermore, the break-down of traditional authoritarian and hierarchical structures also

brings about organization-wide communications that facilitate the development of a shared vision. Hence, EO creates a fertile internal environment for organizational learning to take place. The more entrepreneurial a firm, the more learning-oriented it is, the more likely it instills values that promote commitment to learning, open-mindedness, and shared vision.

Second, entrepreneurial firms pursue proactive action in the markets and aggressive gesture toward competitors. Therefore, entrepreneurial firms engage in proactive and extensive environmental scanning (Miles and Snow, 1978; Daft and Weick, 1984), and constantly face the challenge by new, external information. Hambrick (1982) found the frequency of, interest in, and hours of entrepreneurial scanning were significantly greater in prospector firms – the most entrepreneurial type as described by Miles and Snow (1978). The environmental scanning serves as an impetus for information acquisition and dissemination, an important starting point for learning: executives can only interpret, disseminate, and analyze information that enters the organization, and hence entrepreneurial environmental scanning is a key step in the process of organizational learning and adaptation (Hambrick, 1982). Therefore, EO broadens firms' scope for learning, particularly through exploration and experimentation (March, 1991).

However, to create performance effects it is most important that firms evaluate the potential value of the acquired information to the firm based on the shared understanding of the information, and use and act on the information to achieve the common organizational goals (Slater and Narver, 1995). Firms' commitment to learning and receptivity to new, external information (i.e. open-mindedness) are fundamental to the intensity of learning, but learning is conducive to firm performance only when the learning efforts are channeled effectively toward common organizational goals. Shared vision influences the direction of learning and plays a crucial role in the mediating role of LO in the EO-performance relationship. Developing a common entrepreneurial vision becomes even more challenging when the firm reaches a size where more orderly management systems are established and power needs to be shared (Harrison and Leitch, 2005). A firm's entrepreneurial vision must be conveyed at different levels of the firm in order to align organizational goals with business processes. Overall, EO opens up a scope for learning and particularly favors divergent learning, while LO emphasizes both intensity and a common direction of learning, and hence the convergent effect of learning. Given the above discussion, this study hypothesizes that:

H1. The EO-performance relationship is mediated by LO; EO has a positive impact on LO that, in turn, has a positive impact on firm performance.

The Moderating Role of Strategy Types

Entrepreneurship is a key dimension of Miles and Snow's strategy typology, i.e. prospectors, analyzers, defenders, and reactors. All four types of firms must deal with the 'entrepreneurial problem' (Miles and Snow, 1978). Prospectors approach the environment more proactively and adapt to turbulent environments by using high levels of environmental scanning (Daft and Weick, 1984). They seek to identify and exploit new opportunities through both product and market development (Miles and Snow, 1978). Defenders attempt to create a stable domain by protecting their product-market and prosper through stability, reliability, and efficiency (Slater and Narver, 1993). Analyzers prosper by purposely being more innovative in their product-market initiatives than defenders, but doing so more cautiously and selectively than prospectors (Hambrick, 2003). In practice, an analyzer strategy is, indeed, the most

difficult one for firms to carefully pursue: the analyzer is a “unique combination of the Prospector and Defender types” (Miles and Snow, 1978, p.68). Analyzers seek effectiveness through both efficiency and new products and markets; their dual focus results in increased size because the firm must engage in both mass production and research and development (Doty et al., 1993). Reactors rank the lowest in all dimensions of entrepreneurial behavior (Slater and Narver, 1993). Miles and Snow (1978) initially proposed the reactor type as a fourth ideal strategy type but later described it as a ‘residual’ type of behavior in that firms are forced into this response mode only when they are unable to pursue one of the first three strategies. Doty et al. (1993) find empirical support for the first three ideal types with the defender type and the prospector type at opposite ends of a strategy continuum and the analyzer between these two extremes; the reactor type is, indeed, a residual type as evidenced in their study.

One way to distinguish prospectors from analyzers and defenders is through examining the type of organizational learning involved. Prospectors invest a great deal in technological innovation, development of new ideas, and creation of market awareness, and therefore pioneer industry changes. As a result, the prospector strategy often involves more radical departures from firms’ existing products, markets, administrative procedures, and even mental models and dominant logics than the analyzer and the defender types (Miles and Snow, 1978). Hence, prospectors are involved in a high degree of generative learning. Conversely, defenders mainly engage in adaptive learning that focuses on existing products and markets and improving business processes within their familiar domain. Analyzers lie between prospectors and defenders – on one hand, they are often depicted as imitators, but when opportunities arise they may overtake prospectors by building on prospectors’ innovation and tailoring their innovative products and services offerings to customer needs (Hambrick, 1982). Analyzers learn from prospectors’ successes and failures and capitalize on the mass market. Therefore, analyzers engage in a combination of adaptive learning (e.g. refinement of existing knowledge and incremental changes in business processes and product-market choices) and to some extent generative learning (e.g. the adoption of industry innovation that is beyond their existing domain). It must be noted that the extent of generative learning is greater for prospectors than for analyzers. With particular reference to innovation, prospectors, analyzers, and defenders are pioneers, followers, and late adopters, respectively.

Generative learning is forward-looking, and hence reduces the frequency and magnitude of major shocks (Day, 1994; Sinkula, 1994). Firms that engage in higher-order generative learning have close and extensive relationships with customers, suppliers, and other key constituencies, and possess a cooperative attitude that facilitates mutual adjustment when the unexpected occurs (Webster, 1992). Such firms demonstrate higher flexibility, and hence are able to quickly reconfigure their structure and renew resources and capabilities to focus on the emergent opportunity or threat (Slater and Narver, 1995). Thus, compared with analyzers and defenders, prospectors demonstrate a higher EO that stimulates a higher degree of generative learning that, in turn, has a positive impact on performance. Hence, this study hypothesizes:

H2. The EO-LO-performance relationship is moderated by firm strategy; prospectors are likely to demonstrate stronger linkages in the EO-LO-performance relationship than analyzers followed by defenders.

Figure 1 about here.

METHODS

Sample

The data of this study were gathered via a mailed survey (using 7-point Likert scales) in 2003. Prior to the questionnaire design, six exploratory interviews were conducted with executives in three companies. The survey instrument incorporated insights generated from the interview data, and was subsequently pre-tested among nine managers who participated in a public lecture organized by the university and three university academics with expertise in entrepreneurship and organizational learning. Following this, two interviews were undertaken with two executives from two companies to collect their feedback and experience of filling in the questionnaire. Their comments were incorporated in designing the final questionnaire.

A sample of 1500 UK-based firms (each with at least 50 employees—a criterion for medium-to-large firms defined by the UK Department of Trade and Industry) randomly selected from the FAME Database were sent a questionnaire with a cover letter to the company director or senior executive, and a pre-paid return envelope. As the addressee was requested to either fill in the questionnaire if appropriate, or identify a most suitable person in the company to complete it, the respondents were primarily executives or senior managers including Managing Director, Director of Organizational Learning, Director of Intellectual Capital, Human Resource Director, Chief Information Officer, etc. Following two reminders, a total of 231 questionnaires were received; a 15.4% response rate. After discounting non-valid and incomplete responses, 213 usable responses remained (46.5% in service industries and 53.5% in manufacturing industries), and were subsequently used in the analysis.

ANOVA tests were performed to examine possible non-response bias, as suggested by Armstrong and Overton (1977). Respondents were divided into three groups based on whether they responded to the first mailing, the first follow-up or the second follow-up. It is assumed that the group who responded to the second follow-up is most similar to non-respondents (Armstrong and Overton, 1977). The results revealed that there was no significant difference between the three groups on EO, LO, firm performance, firm age, and firm size and thus there was no evidence of systematic non-response bias.

Measures

The data analysis of this study follows a two-step procedure: assessing measurement models using confirmatory factor analysis (CFA), followed by assessing path relationships using structural equation modeling (SEM) (Anderson and Gerbing, 1988). The statistical software AMOS 6.0 was employed and the Maximum Likelihood estimation method was used. The model fit was assessed using χ^2/df , goodness-of-fit index (GFI) (Jöreskog and Sörbom, 1996), and the comparative fit index (CFI) (Bentler, 1992)¹. The threshold for χ^2/df should be less than 3.0, or less than 2.0 in a more

¹ Results of χ^2 , df, and p value are also reported in this study. χ^2 is sensitive to sample size and assumes a perfect fit between the hypothesized model and the sample data. In complex models χ^2 tends to be very large, and its associated p value tends to indicate insignificance. Hence, researchers often use χ^2/df instead to address the limitations of χ^2 .

restrictive sense (Premkumar and King, 1994). Values of GFI and CFI should be over 0.90.

This study based the measure for EO on Miller (1983). Subsequent studies (e.g. Covin and Slevin, 1986, 1989; Naman and Slevin, 1993) extended and refined the scale that is now referred to as the Miller/Covin and Slevin scale (Brown et al., 2001). Wiklund (1998) identified at least twelve studies based on this scale, and these studies suggested that this measure is a viable instrument for capturing firm-level entrepreneurship. Proactiveness is assessed by asking managers about the firm's tendency to lead, rather than follow, in terms of developing new procedures, technologies, and new products or services (Miller and Friesen, 1978; Covin and Slevin, 1989). Aggressiveness is measured by competitive processes used by managers to pursue rivals or take up new competitors, since its point of reference is the competition (Lumpkin and Dess, 1996). Firm risk-taking is assessed by asking managers about the firm's propensity to engage in risky projects and managers' preference for bold versus cautious acts to achieve firm objectives (Lumpkin and Dess, 1996). Lumpkin and Dess (1996) reckon that most entrepreneurship research based on Miller's (1983) concept of innovativeness demonstrates a common weakness, that is, Miller (1983) focused exclusively on the product-market and technological aspects of innovation and lacked measures for a firm's overall propensity of innovative behavior. Given this, this study adapted two items from Miller and Friesen (1983) and one item from Hurt et al. (1977) to measure firm innovativeness. In total, 11 items were included in the EO scale. Details of the items are included in the Appendix. CFA tests were performed, with EO as a higher-order latent construct, consisting of the four first-order indicators. The measurement model resulted in a good fit: $\chi^2 = 79.771$, $df=40$, $p=0.000$, $\chi^2/df=1.994$, $GFI=0.938$, $CFI=0.960$. The first-order loadings ranged from 0.52 to 0.93 ($t>1.96$, $p<0.001$). The second-order loadings ranged from 0.60 to 0.99 ($t>1.96$, $p<0.001$).

This study adopted the LO scale developed by Sinkula et al. (1997) and re-tested by Baker and Sinkula (1999) who found further support for its validity and reliability. The higher-order LO construct consisted eleven items partitioned into three first-order factors, i.e. commitment to learning, open-mindedness, and shared vision. Commitment to learning is measured through examining the extent to which firms place value on organizational learning and consider learning as an investment rather than expenses (Sinkula et al., 1997). Open-mindedness is measured through examining whether a firm critically reflects on existing assumptions and business processes (Sinkula et al., 1997). Shared vision is measured by examining the extent to which a firm holds a common goal at different levels and promotes a sense of direction (Baker and Sinkula, 1999). The model fit indexes indicated an adequate fit: $\chi^2 = 99.637$, $df=41$, $p=0.000$, $\chi^2/df=2.430$, $GFI=0.923$, $CFI=0.954$. All loadings were significant ($t>1.96$, $p<0.001$), the first-order loadings ranging from 0.43 to 0.89 and the second-order loadings ranging from 0.75 to 0.94 ($t>1.96$, $p<0.001$).

This study ascribes to the view that performance comparisons with competitors reveal important information (Birley and Westhead, 1990; Wiklund and Shepherd, 2003). Therefore, three subjective indicators were used to measure firm performance: respondents were asked to compare the return on capital employed, earnings per share, and sales growth of their own firm with those of their main competitors in the past five years. The model resulted in a good fit: $\chi^2 = 1.800$, $df=1$, $p=0.180$,

χ^2 /df=1.800, GFI=0.994, CFI=0.996. The loading of each indicator to the overall performance factors was significant, ranging from 0.58 to 0.85 ($t > 1.96$, $p < 0.001$).

For each construct, the dimensionality of each item was assessed by the loadings and their associated t-ratios (Anderson and Gerbing, 1988). The results showed that each item loaded significantly on only its respective first-order factor, and subsequently the higher-order construct, without cross-loading to any other first-order factor of the same construct. Reliability was assessed by using both coefficient alpha (Peter, 1979) and composite reliability (Fornell and Larcker, 1981). The alpha for EO was 0.87, and for each first-order factor ranged from 0.67 to 0.86. The composite reliability of EO was 0.85, and for each first-order factor ranged from 0.68 to 0.87. The alpha for LO was 0.90, and for each first-order factor ranged from 0.62 to 0.89. The composite reliability for LO was 0.89, and for each first-order factor ranged from 0.65 to 0.89. All assessed indicators for reliability were above the acceptance level for the study constructs. Convergent validity was examined by assessing the average variance extracted (AVE) (Fornell and Larcker, 1981). All the AVEs for the study constructs and their respective first-order factors were above 0.5, which is the indicative threshold recommended by Bagozzi and Yi (1988). The discriminant validity was assessed by comparing AVE of each of the first-order factor with the shared variances of this first-order factor with any other first-order factors of the study constructs. All AVEs were higher than all shared variances, indicating discriminant validity of the study constructs. Table 1 shows the results of the measurement analysis.

Table 1 about here

Strategy types were measured using categorical data following Miles and Snow's (1978) strategy typology: prospectors ($n=71$), analyzers ($n=70$), defenders ($n=41$), and reactors ($n=22$). Research has found strong and consistent support for the basic validity of the typology in a wide array of settings (e.g. hospitals, colleges, banking, industry products, and life insurance) (Hambrick, 2003). A self-typing measure (where informants are asked to identify the description of a strategy type that is most close to their company strategy) was adapted from Snow and Hrebiniak (1980). This self-typing approach has been used by many scholars (e.g. McKee et al., 1989; Vorhies and Morgan, 2003) and proves to be a variable measure for firm strategy type. In addition, this study included a control variable: industry type. Two broad industry groups were identified, namely manufacturing ($n=114$) and services ($n=99$).

This study relies on self-reported data from single informants. This introduces the potential of common method variance (Podsakoff et al., 2003). Several studies (Spector, 1987; Williams et al., 1989; Bagozzi and Yi, 1990) examined the effect of common method variance and resulted in mixed findings². Scholars are cautious and recommend both procedural and statistical methods to minimize the bias (Tepper and Tepper, 1993; Podsakoff et al., 2003). In this study, respondents were assured of the confidentiality and anonymity to reduce evaluation apprehension (a procedure recommended by Podsakoff et al., 2003). Moreover, this study conducted the

² Spector (1987), based on multitrait-multimethod analyses, concluded that common method bias tended to be small and rarely statistically significant, and its effect on relations among variables were 'minor at best'. Conversely, Williams et al. (1989) re-analyzed Spector's (1987) data using confirmatory factor analysis and found that common method variance was prevalent and accounted for approximately 25% of the variance in the measures. Furthermore, Bagozzi and Yi (1990) provided additional analyses and concluded that common method variance was less prevalent than Williams et al. (1989) claimed but more prevalent than Spector (1987) asserted.

Harman's one-factor test (Podsakoff and Organ, 1986), a technique often adopted by researchers to examine the common method bias. All variables of the EO, LO, and firm performance constructs were entered into an exploratory factor analysis. The results revealed that no single factor emerged from this analysis, nor was there a general factor which could account for the majority of variance in these variables: the first factor accounted for only 18.8% of the total variance. Thus, this indicates that common method bias is not a major problem in this study.

ANALYSIS AND RESULTS

The Mediating Effect of LO

This study follows the SEM approach to testing the mediating effect as suggested by James et al. (2004)³: a full mediating model should be tested with a path from the independent variable (EO) to the mediator (LO) and a path from the mediator (LO) to the dependent variable (firm performance); a direct relationship between the independent variable (EO) and dependent variable (firm performance) is not expected, and hence a direct path does not need to be included. The approach has been supported by MacKinnon et al. (2002) and Schneider et al. (2005). The SEM model in this study consisting of three latent constructs (i.e. EO, LO, and firm performance as shown in Figure 1) resulted in an adequate fit and the model fit indexes were: $\chi^2=89.325$, $df=33$, $p=0.000$, $\chi^2/df=2.707$, $GFI=0.920$, $CFI=0.932$. The loading of EO to LO was significant (0.83, $t=8.310$, $p<0.001$). The loading of LO to firm performance was also significant (0.53, $t=6.125$, $p<0.001$). The results support H1: LO mediates the EO-performance relationship.

The Moderating Effect of Strategy Type

The strength of the hypothesized EO-LO-performance relationship was compared between the prospector type ($n=71$) and the analyzer type ($n=70$). The defender type ($n=41$) and the reactor type ($n=22$) resulted in insufficient sample size for structural equation modeling. Most importantly, the prospector and the analyzer types are referred to as two close, but distinct entrepreneurial groups in the strategy continuum (Doty et al., 1993). Hence, it is worthwhile testing if there are any differences between the two strategy types in the modeled relationships.

The prospectors and the analyzers were submitted for the multigroup analysis (Jöreskog et al., 1999) of the hypothesized EO-LO-performance relationship. Anderson and Gerbing's (1982) χ^2 difference test was used to evaluate if the differences in the modeled relationships are statistically significant across groups. First, the unconstrained model (where both paths of EO-LO and LO-performance were allowed to vary freely across groups) was tested and resulted in $\chi^2=79.871$, $df=66$. Second,

³ James et al. (2004) and Schneider et al. (2005) reckon that the SEM approach and Baron and Kenny's (1986) regression approach to testing mediation share many similarities and differences. A key difference is that Baron and Kenny's (1986) approach presumes a partial mediation baseline model that is inappropriate for the SEM approach. Kenny et al. (1998) updated Baron and Kenny's (1986) approach and noted that Step 1 of the original Baron and Kenny's procedure (i.e. the independent variable is linked directly to the dependent variable) is not required and the essential steps in establishing mediation are Steps 2 and 3. MacKinnon et al. (2002) noted that the SEM approach provides the best balance of type I error rates and statistical power relative to Baron and Kenny's approach. James et al. (2004) and Schneider et al. (2005) provide a detailed discussion on the two approaches.

three constrained models were tested: the constrained model A (where only the EO-LO path was specified as equal across groups) resulted in $\chi^2 = 84.121$, $df=67$; the constrained model B (where only LO-performance path was specified as equal across groups) resulted in $\chi^2 = 80.055$, $df=67$; the constrained model C (where both paths of EO-LO and LO-performance were specified as equal across groups, respectively) resulted in $\chi^2 = 84.153$, $df=68$. The χ^2 results of the constrained model A and C were significantly higher than the unconstrained model ($p < 0.05$), whilst the increase of χ^2 of the constrained model B was not significant. Details are reported in Table 2.

The results indicate that there was significant difference in the EO-LO-performance relationship between the prospectors and the analyzers and thus H2 is supported: the links of EO-LO-performance vary in strength between prospectors and analyzers. More specifically, the significant difference occurred in the strength of EO-LO that varied between the prospectors and the analyzers. The results of the unconstrained model showed that the loadings from EO to LO were 0.92 for prospectors and 0.86 for analyzers, and the loadings from LO to performance were 0.43 for prospectors and 0.36 for analyzers.

Results of Control Variable

To test the stability of the hypothesized EO-LO-performance relationship across industry groups, this study used a multigroup analysis to test if there was any difference in the hypothesized relationships across the two broad industry groups: manufacturing ($n=114$) and services ($n=99$). The unconstrained model resulted in $\chi^2 = 135.769$, $df=66$. Three constrained models were compared with this unconstrained model: the constrained model A (where only the path of EO- LO was specified as equal across groups) resulted in $\chi^2 = 135.877$, $df=67$; the constrained model B (where only the path of LO-performance was specified as equal across groups) resulted in $\chi^2 = 136.083$, $df=67$; the constrained model C (where both paths of EO-LO and LO-performance were specified as equal across groups, respectively) resulted in $\chi^2 = 136.123$, $df=68$. The χ^2 of each constrained model was not significantly higher than the unconstrained model, indicating there was no difference in the EO-LO-performance relationship across the two industry groups. Results are reported in Table 2.

Table 2 about here.

DISCUSSION

This study set out a task to examine the EO-LO-performance relationship and whether their links vary in strength across Miles and Snow's (1978) strategy types. First, this study found that the EO-performance relationship was mediated by a firm's LO – a missing link in prior literature. More specifically, this study found that firm innovativeness, relative to market proactiveness and competitive aggressiveness, had higher correlation coefficients with each of the first-order factors of LO (0.505 with commitment to learning, 0.589 with shared vision, and 0.607 with open-mindedness) as shown in Table 1. This is because innovativeness and LO both have a stronger internal orientation toward business processes and self-renewal, whilst proactiveness and

aggressiveness both have a stronger external orientation toward the market and the competition. Innovative firms encourage people to seek unusual and novel solutions, and tolerate mistakes (Hurt et al., 1977; Miller and Friesen, 1983). Therefore, individuals within the firm are motivated to learn and more receptive to new information. Furthermore, innovative firms often adopt cross-functional teams (Kuratko et al., 2001), rather than traditional authoritarian and hierarchical structures, to facilitate communications that, in turn, bring about an organization-wide consensus of goals and directions. Hence, innovative firms instill values of commitment to learning, open-mindedness, and shared vision.

Risk-taking had lowest correlation coefficients with all first-order factors of LO (0.252, 0.248, and 0.308), respectively. The first impression is that the findings seem contradictory to March's (1991) prediction: risk-taking is associated with exploration and discovery of new, external information. However, a closer examination reveals that firms must strike a balance between exploration and exploitation, and that firms engaging in exploration to the exclusion of exploitation are likely to suffer the costs of experimentation without gaining its benefits (March, 1991). Firms with a distinct focus on risk-taking and exploration result in too many underdeveloped new ideas (March, 1991), and suffer from diverted efforts and scattered internal resources rather than maintaining a focused direction. This explains that risk-taking had a low correlation with LO, particularly shared vision. Risk tolerance is an important characteristic of entrepreneurial firms, but highly risky actions are not necessarily conducive to learning and consequently to performance (0.197); instead, careful study of potential risks and mitigating risks is, indeed, a learning process. One example of minimizing the risk and maximizing learning in product innovation is to work extensively with lead customers (Von Hippel, 1986).

Among all the first-order factors of LO, shared vision had the highest correlation with firm performance (0.407). This is consistent with our prediction and the theory: although EO creates a fertile internal environment and broadens the scope for organizational learning to occur, in medium-to-large firms an entrepreneurial vision must be shared effectively amongst all organizational members in order to bring about a positive effect on performance (Harrison and Leitch, 2005). Failing this, the reality of a firm would be featured by highly enthusiastic and committed individuals pulling the firm toward different directions. The above findings collectively reveal that firms must develop a vision and, above all, communicate it to people at different levels. Without a focus, entrepreneurial efforts are thinned without reaping performance benefits. Hence, shared vision is a crucial element in the mediating role of LO in EO-performance relationship.

Second, the results of the multigroup analysis reveal that between the prospectors and the analyzers there were significant differences in the EO-LO-performance relationship. More specifically, the differences occurred in the EO-LO relationship; EO had a stronger positive impact on LO for prospectors (0.92, $t=7.158$, $p<0.001$) than for analyzers (0.86, $t=3.938$, $p<0.001$). Prospectors are often involved in questioning existing assumptions, beliefs, values, and mental models, and challenging existing routines, products, markets, and competition (Miles and Snow, 1978). These characteristics are related to generative learning. Analyzers more often engage in exploitation of existing knowledge and technologies and make adaptation. Therefore, the results reinforce the message that LO is, indeed, an important mediating factor in the examination of the EO-performance relationship, and an insightful dimension (along with EO) that distinguishes Miles and Snow's (1978) strategy types.

Business practices exemplify the EO-LO-performance relationship: EO may positively influence LO through stimulating firms to 'unlearn' old ways of doing things; or through enabling flexibility and facilitating firms to reconfigure their skills and talents. An example for the former route was observed by Zahra et al. (1999): in the late 1980s throughout the 1990s large firms, in light of entrepreneurial spirit that favors change and innovation, went through organizational transformation through reorganization, downsizing, and restructuring. Such organizational transformation resulted in the removal of obsolete organizational routines (i.e. unlearning) and enabled a higher-order generative learning to occur. An example of the latter route is exhibited in the study of Kuratko et al. (2001): Acordia's entrepreneurship strategy enabled decentralization and the formation of new venture teams – cross-functional teams acting as a primary source of processes, products, and market innovativeness. Such new venture teams instilled flexibility and served as a mechanism of skills reconfiguration, which is instrumental to Acordia's learning process through pooling talents, facilitating sharing of tacit knowledge, encouraging collective learning, and empowering employees to be creative and responsive to market opportunities. Research results and business practices support that EO has a positive impact on LO that, in turn, is conducive to firm performance.

Research Limitations and Practical Implications

As in any study, the findings of this paper must be viewed in light of its boundaries and limitations. Conceptually, this study developed a research model and articulated the EO-LO-performance relationship in a particular way to capture characteristics of medium-to-large firms and to focus on firm-level learning and entrepreneurial behavior. Future research examining the EO-LO relationship in micro or small firms must take into account individual entrepreneurs' learning that plays a key role in the firm's learning process, and develop alternative models. Moreover, Sinkula et al.'s (1997) LO construct only captures a firm's values that underpin its general tendency toward organizational learning, but does not directly measure the extent to which a firm engages in adaptive or generative learning. Given that generative and adaptive learning are paramount to gauge the extent of a firm's EO, future research must endeavor to develop an effective measurement for LO that conceptually captures the behavior and processes involved in the two types of organizational learning.

Methodologically, this study relied on self-reported data from single informants. Although the Harman's one factor test results indicated that common method bias is not a major problem in this study, the interpretation of the findings must be viewed in light of this limitation. According to Williams et al. (1989), common method bias may account for more than 25% of the variance between perceptual and attitudinal variables. Therefore, the strong relationships of EO-LO (0.83) and then LO-performance (0.53) should be discounted accordingly. Moreover, given that the sample of this study included only medium-to-large, established firms, and that SEM puts high demand on sample size in relation to the number of parameters estimated, this study did not control firm size and age in the examination of hypothesized relationships. Firm age is particularly important in the examination of LO in smaller entrepreneurial firms during the start-up, break-out, and mature stages. Future research should include a more heterogeneous sample, controlling the effect of firm size and age. Finally, this study dropped the defender and reactor types in the multigroup analysis due to the constraint of the sample size. Since the findings reveal that LO is an important dimension in addition to EO to distinguish Miles and Snow's (1978) strategy types, future research should include all strategy types in a systematic study of the EO-LO relationship.

Despite the limitations, this study contributes to the EO-performance relationship by providing empirical evidence to support that LO mediates and firm strategy moderates the effect of EO on firm performance. The managerial implications are that for medium-to-large firms, the challenges for channeling their entrepreneurial resources toward the improvement of firm performance are mainly three-fold: First, the entrepreneurial spirit must be shared at different levels within the firm – developing a shared vision is particularly important alongside maintaining open-mindedness and commitment to learning. Second, larger firms, unfortunately, often mean many management layers and slow decision-making. Championing an entrepreneurial spirit that favors change may help the firm to streamline business processes, promote autonomous decision-making, and tap into individuals' creative power – these will engender a higher-order generative learning that requires the desertion of old traditions. Third, firms must endeavor to balance adaptive and generative learning in line with their chosen firm strategy, allowing for exploration and experimentation as well as fully developing existing ideas. Firms engaging in adaptive learning to the exclusion of generative learning may find themselves stuck in a 'competence trap', while those engaging in generative learning to the exclusion of adaptive learning may find their resources and efforts too spread out to reap any performance benefits.

CONCLUSION

Creating wealth is at the heart of entrepreneurship (Ireland et al., 2001). The findings of this study enhance the understanding of the EO-performance relationship in several aspects: in medium-to-large firms EO is important for performance; LO is an important mediator in the EO-performance relationship; and the EO-LO link is stronger for the prospectors than the analyzers. Entrepreneurial firms must foster organizational learning in order to maximize the effect of EO on performance.

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APPENDIX

The Entrepreneurial Orientation Scale

First-order Factor	Code	Statement
Market proactiveness	PR1	In general, the top managers of our organization favor a strong emphasis on Research & Development, technological leadership, and innovations.
	PR2	In the past five years, our organization has marketed a large variety of new lines of products or services.
	PR3	In the past five years, changes in our products or service lines have been mostly of a minor nature. (Reverse coded)
Competitive aggressiveness	AG1	In dealing with competitors, our organization often leads the competition, initiating actions to which our competitors have to respond.
	AG2	In dealing with competitors, our organization typically adopts a very competitive posture aiming at overtaking the competitors.
Firm risk-taking	RK1	In general, the top managers of my organization have a strong propensity for high risk projects (with chances of very high return).
	RK2	The top managers believe owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve our organization objectives.
	RK3	When there is uncertainty, our organization typically adopts a "wait and see" posture in order to minimize the probability of making costly decisions. (Reverse coded)
Firm innovativeness	IN1	Management actively responds to the adoption of "new ways of doing things" by main competitors.
	IN2	We are willing to try new ways of doing things and seek unusual, novel solutions.
	IN3	We encourage people to think and behave in original and novel ways.

Notes: (1). Respondents were given instructions to circle a number (ranging from 1, "strongly disagree" to 7, "strongly agree") that corresponded to their agreement to each of the following statements. (2). Unless otherwise indicated, items were adapted from Naman and Slevin (1993). IN1 and IN2 were adapted from Miller and Friesen (1983). IN3 was adapted from Hurt et al. (1977).

The Learning Orientation Scale

First-order Factors	Code	Statements
Commitment to learning	CL1	Managers basically agree that our organization's ability to learn is the key to our competitive advantage.
	CL2	The basic values of this organization include learning as a key to improvement.
	CL3	The sense around here is that employee learning is an investment, not an expense.
	CL4	Learning in my organization is seen as a key commodity necessary to guarantee organizational survival.
Shared vision	SV1	There is a commonality of purpose in my organization.
	SV2	There is total agreement on our organizational vision across all levels, functions, and divisions.
	SV3	All employees are committed to the goals of this organization.
	SV4	Employees view themselves as partners in charting the direction of the organization.
Open-mindedness	OM1	We are not afraid to reflect critically on the shared assumptions we have made about our customers.
	OM2	Personnel in this organization realize that the very way they perceive the marketplace must be continually questioned.
	OM3	We rarely collectively question our own business about the way we interpret customer information. (Reverse coded)

Notes: (1). Respondents were given instructions to circle a number (ranging from 1, "strongly disagree" to 7, "strongly agree") that corresponded to their agreement to each of the following statements. (2). All items were adopted from Sinkula et al. (1997).

The Performance Scale

Code	Items
p1	Return on capital employed
p2	Sales growth
p3	Earnings per share

Notes: Respondents were given instructions to circle a number (ranging from 1, "much worse" to 7, "much better") that corresponded to their business performance in comparison to their main competitors in the past five years.

Strategy Types

Prospector	This organization typically operates within a broad product-market domain that undergoes periodic redefinition. The organization values being 'first in' in new product and market areas even if not all of these efforts prove to be highly profitable. The organization responds rapidly to early signals concerning areas of opportunity, and these responses often lead to a new round of competitive actions. However, this organization may not maintain market strength in all of the areas it enters.
Analyzer	This organization attempts to maintain a stable, limited line of products or services, while at the same time moving out quickly to follow a carefully selected set of the more promising new developments in the industry. The organization is seldom 'first in' with new products or services. However, by carefully monitoring the actions of major competitors in areas compatible with its stable product-market base, the organization can frequently be 'second in' with a more cost-efficient product or service.
Defender	This organization attempts to locate and maintain a secure niche in a relatively stable product or service area. The organization tends to offer a more limited range of products or services than its competitors, and it tries to protect its domain by offering higher quality, superior service, lower prices, and so forth. Often this organization is not at the forefront of developments in the industry – it tends to ignore industry changes that have no direct influence on current areas of operation and concentrates instead on doing the best job possible in a limited area.
Reactor	This organization does not appear to have a consistent product-market orientation. The organization is usually not as aggressive in maintaining established products and markets as some of its competitors, nor is it willing to take as many risks as other competitors. Rather, the organization responds in those areas where it is forced to by environmental pressures.

Notes: (1). Respondent were asked to tick only one of the above statements that most closely described their organization. (2). The above measure was adopted from Snow and Hrebiniak (1980).

Figure 1. The Research Model and Hypotheses

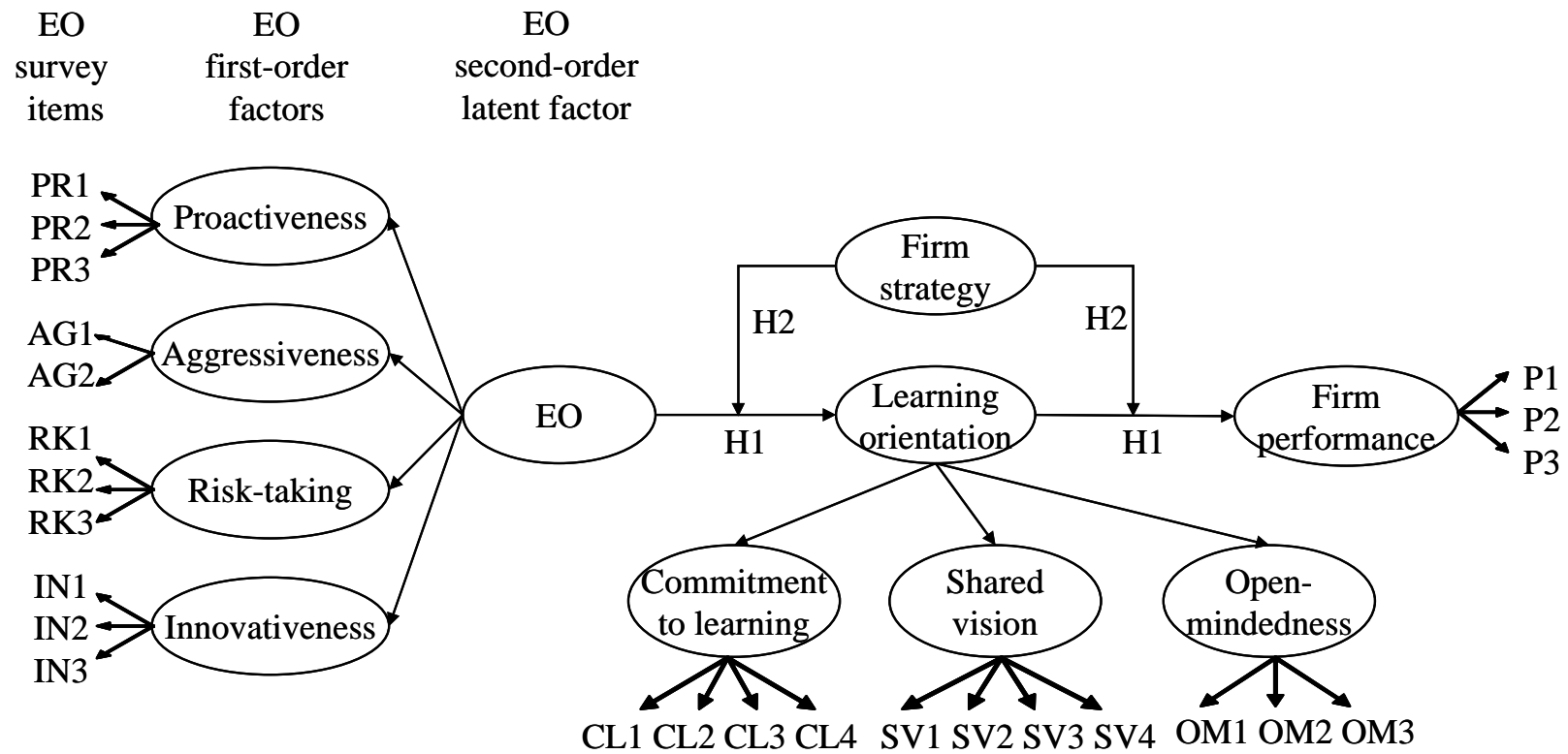


Table 1. Correlation Coefficients and Shared Variances

Measure	Mean	Standard deviation	1	2	3	4	5	6	7	8
Entrepreneurial orientation (EO)	4.286	0.999								
1. Proactiveness	4.496	1.388	1.000	0.626 ¹	0.370	0.505	0.485	0.415	0.414	0.305
2. Aggressiveness	4.695	1.328	0.392 ²	1.000	0.475	0.470	0.391	0.418	0.465	0.404
3. Risk-taking	3.682	1.202	0.137	0.226	1.000	0.358	0.252	0.248	0.308	0.197
4. innovativeness	4.409	1.259	0.255	0.221	0.128	1.000	0.505	0.589	0.607	0.273
Learning orientation (LO)	4.396	1.080								
5. Commitment to learning	4.727	1.337	0.235	0.153	0.064	0.255	1.000	0.620	0.499	0.336
6. Shared vision	4.143	1.322	0.172	0.175	0.062	0.347	0.384	1.000	0.600	0.407
7. Open-mindedness	4.293	1.103	0.171	0.216	0.095	0.368	0.249	0.360	1.000	0.354
8. Firm performance	4.407	1.092	0.093	0.163	0.039	0.075	0.113	0.166	0.125	1.000

Note: (1). Correlation coefficients are reported in the upper diagonal half of the matrix, and are significant at $p < 0.001$. (2). The shared variances are reported in the lower diagonal half of the matrix.

Table 2. Results of Multigroup Analysis

	Description	χ^2	df	$\Delta \chi^2$	Statistical significance
Multigroup analysis by strategy type ¹	The unconstrained model	79.871	66	-	-
	Constrained model A: The path of EO to LO is specified as equal across groups.	84.121	67	$\Delta \chi^2 = 4.250, \Delta df = 1$	p<0.05
	Constrained model B: The path of LO to firm performance is specified as equal across groups.	80.055	67	$\Delta \chi^2 = 0.184, \Delta df = 1$	NS
	Constrained model C: Both of the above paths are fixed as equal across groups respectively.	84.153	68	$\Delta \chi^2 = 4.282, \Delta df = 2$	p<0.05
Multigroup analysis by industry type ²	The unconstrained model	135.769	66	-	-
	Constrained model A: The path of EO to LO is specified as equal across groups.	135.877	67	$\Delta \chi^2 = 0.108, \Delta df = 1$	NS
	Constrained model B: The path of LO to firm performance is specified as equal across groups.	136.083	67	$\Delta \chi^2 = 0.314, \Delta df = 1$	NS
	Constrained model C: Both of the above paths are fixed as equal across groups respectively.	136.123	68	$\Delta \chi^2 = 0.354, \Delta df = 2$	NS

Notes: (1). The total sample size is 141, including 71 prospectors, and 70 analyzers. (2). The total sample size is 213, including 114 companies in the manufacturing industry, and 99 companies in the services industry. (3). $\Delta \chi^2$: difference in χ^2 value between models; Δdf : difference in the number of degrees of freedom; NS: non significant.