The effect of competence exploration and competence exploitation on strategic entrepreneurship

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The effect of competence exploration and competence exploitation on strategic entrepreneurship

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Strategic entrepreneurship captures firms’ efforts to simultaneously excel at opportunity seeking and advantage seeking. But little research exists into mechanisms that might facilitate strategic entrepreneurship. Drawing on the twin concepts of competence exploration and competence exploitation, we study their effects on strategic entrepreneurship. Theoretically, the entrepreneurial components of strategic entrepreneurship (an entrepreneurial mindset and creating innovation) should benefit from competence exploration while its strategic components (managing resources strategically and executing competitive advantages) should benefit from competence exploitation, but not vice-versa. Our findings, however, suggest that this theoretical dichotomy does not hold up in practice.

Keywords: strategic entrepreneurship; competence exploration; competence exploitation

Introduction

The need to balance opportunity-seeking behaviour (entrepreneurship) and advantage-seeking behaviour (strategic management) represents a chief management concern (Schindehutte and Morris 2009). Successfully achieving this balance has been labelled as ‘strategic entrepreneurship’. Ireland, Hitt, and Sirmon (2003) depict strategic entrepreneurship as a four-step linear sequence of stages by which a firm alternates between episodes of entrepreneurial and strategic behaviour in a process of strategic entrepreneurship. Its four components are labelled as (1) an ‘entrepreneurial mindset’ to identify opportunities (entrepreneurial), (2) ‘managing resources strategically’ (strategic), (3) ‘creating innovation’ (entrepreneurial), and (4) ‘executing competitive advantages’ (strategic). The successful completion of these stages in turn should create value and wealth in ways far superior to a firm competent at entrepreneurship or strategy alone.

The study of strategic entrepreneurship is important for two reasons. First, the success or failure of a firm at strategic entrepreneurship holds the potential to explain why firms that identify opportunities prove unable to exploit them sufficiently and fail to develop requisite competitive advantages, and explain why firms with competitive advantages lose their ability to identify...
valuable entrepreneurial opportunities, lose market position and fail to sustain advantages over time (Ireland, Hitt, and Sirmon 2003; Schindehutte and Morris 2009). Second, the returns to strategic entrepreneurship can create wealth for organisations and society (e.g., Schendel and Hitt 2007). For organisations, strategic entrepreneurship synthesises both entrepreneurial and strategic action concurrently to optimise the pursuit of opportunity and the creation of advantage in turn. In doing so, the ability of the firm to create value for shareholders increases in its novelty and durability (e.g., Ireland, Hitt, and Sirmon 2003; Monsen and Boss 2009; Sirmon, Hitt, and Ireland 2007). For society, strategic entrepreneurship contributes through the creation of new value that better meets social needs (Schendel and Hitt 2007).

Despite the construct’s importance, however, important gaps exist in our understanding of the ways in which firms can achieve strategic entrepreneurship (e.g., Ireland, Hitt and Sirmon 2003; Luke and Verreynne 2006; Monsen and Boss 2009; Upson, Ketchen and Ireland 2007), and consequently how its wealth and value creation potential can be realised. This problem is grounded in the difficulties firms face in continuously managing the four components of strategic entrepreneurship. Conflict can arise from efforts to adapt between entrepreneurial and strategic actions. This might occur when change in the environment presents challenges to existing competitive advantage or market strengths. Consider the example of Sony and Apple. When Apple introduced iTunes and iPod in response to the digital music opportunity, Sony, although traditionally entrepreneurially oriented, attempted to protect its current technology and market position by deploying resources to consolidate its position in the music industry. Strategically, this was a rational response to a threat, but in the meantime, it lost sight of potential entrepreneurial opportunities. It has taken Sony great effort to provide a rival to iPod but still has no actual alternative for iTunes, despite more than six years of aggressive market activity. So, an excessive emphasis on managing current resources may undermine the capacity to innovate and respond to change, hence the complexity of completing the process of strategic entrepreneurship activity.

This example illustrates the problem present in strategic entrepreneurship research: we know little of the mechanisms that aid strategic entrepreneurship’s components to work effectively. We posit that the theory of organisational adaptation and its twin concepts of competence exploration and competence exploitation (Atuahene-Gima 2005; March 1991), can help scholars and managers understand organisational antecedents to strategic entrepreneurship.

Competencies capture the skills and related routines that influence a firm’s ability to create and deliver superior value and wealth (Day 1994), reflecting an organisational attitude manifested in investment decisions (Chandy and Tellis 1998) that can lead to one set of activities being prioritised over another (Leonard-Barton 1992; March 1991). Competence exploration is defined as the tendency of a firm to invest resources to acquire entirely new knowledge, skills and processes (Atuahene-Gima 2005). It represents actions and attitudes pertaining to discovery and experimentation, which theoretically might enhance a firm’s efforts to identify entrepreneurial opportunities and create innovation (March 1991; Schindehutte and Morris 2009). Competence exploitation represents acts of refinement and gradual improvement, which theoretically might enhance a firm’s efforts to manage resources efficiently and strategically and enhance its efforts to execute and optimise current advantages (March 1991; Schindehutte and Morris 2009; Sirmon, Hitt, and Ireland 2007). Both also carry risk.

The antagonistic nature of competence exploration and exploitation and their connection to strategic entrepreneurship has been highlighted at the conceptual level (Schindehutte and Morris 2009). As organisational attitudes manifested in very different investment decisions, the tendency of competence exploitation to crowd out competence exploration risks compromising the entrepreneurial components of strategic entrepreneurship (Atuahene-Gima 2005). Equally,
competence exploration and its tendency towards discovery, experimentation and radical change might inhibit a firm from capitalising on its current resources and advantages in increasingly optimal ways (Atuahene-Gima 2005).

Given the theoretical salience of competence exploration and competence exploitation as possible antecedents to strategic entrepreneurship, and in light of the dysfunctional effects theory posits they can have, the following research question emerges: What relationship exists between competence exploration, competence exploitation and strategic entrepreneurship? To answer this question, the study examines: (a) whether competence exploration solely influences the entrepreneurial components of strategic entrepreneurship; (b) whether competence exploitation solely influences the strategic components of strategic entrepreneurship; (c) whether competence exploration has a dysfunctional effect on the strategic components of strategic entrepreneurship; and (d) whether competence exploitation has a dysfunctional effect on the entrepreneurial components of strategic entrepreneurship.

Our work contributes in a number of ways. Research related to strategic entrepreneurship to date remains primarily theoretical in nature. The current study constitutes one of the first attempts to operationalise the construct based on Ireland, Hitt, and Sirmon’s (2003) model. This is a primary step prior to an analysis of the means to manage strategic entrepreneurship. Therein, the study examines the implications of investments made towards the processes of competence exploration and exploitation for enabling strategic entrepreneurship. In doing so, we contribute to scholarly calls to empirically understand their relationship with strategic entrepreneurship (Schindehutte and Morris 2009), and to knowledge about whether the dysfunctional effects of competence exploration and competence exploitation impact upon strategic entrepreneurship.

The paper is organised into three parts. Next, relevant literature and theory are examined to specify the relationships expected among competence exploration, competence exploitation and strategic entrepreneurship. Afterwards, the research methodology and results are reported. The paper finishes with a review of the contributions to theory and managers from the study findings.

**Theoretical framework and hypotheses**


**Strategic entrepreneurship**

Ireland, Hitt, and Sirmon (2003) theorise a process of strategic entrepreneurship in which a firm iterates from entrepreneurial to strategic activity in a linear process. Starting with an entrepreneurial mindset to identify new business opportunities, the firm moves to a strategic behaviour in the form of managing resources strategically before switching back to entrepreneurial action in applying creativity and developing innovation. The process concludes with a switch back to strategic action with the development, deployment and maintenance of competitive advantage. The effective completion of this process creates wealth (Ireland, Hitt, and Sirmon 2003). Google appears to be successful at this process in that it consolidates revenue from information management but also innovates on software and mobile phones to generate new and diverse revenue streams.

An entrepreneurial mindset is defined as a focus on creativity and renewal, capturing scanning efforts to seek out, identify and develop opportunities for new business (Ireland, Hitt, and Sirmon
Managing resources strategically involves a set of actions to structure, bundle and leverage firms’ stocks of resources to frame and filter those opportunities identified in the previous stage (Sirmon, Hitt, and Ireland 2007). Structuring entails acquiring, accumulating and divesting the resources required by the firm. Bundling involves stabilising and enriching resources to form capabilities to inform the exploitation of entrepreneurial opportunities and the development of competitive advantage. Leveraging involves mobilising, coordinating and deploying resources and capabilities to capitalise on particular market opportunities (Kazanjian, Drazin, and Glynn 2000).

The innovating component represents the means by which creativity is realised and applied in the firm. The act of innovating entrepreneurially can assist firms to exploit entrepreneurial opportunities in radical, discontinuous and disruptive ways that ultimately shift the basis of competition in the industry towards the firm (Danneels 2002). Last, the execution of competitive advantage component represents the extent to which an organisation is able to create a defensible position over its competitors by deploying current advantages in conjunction with new bundles when pursuing opportunities (Ireland, Hitt, and Sirmon 2003).

The entrepreneurial components of strategic entrepreneurship (entrepreneurial mindset and creating innovation) require investments in processes underpinning experimentation, play and discovery. Such investments are synonymous with competence exploration (Atuahene-Gima 2005; March 1991). Its strategic components (the strategic management of resources and the execution of competitive advantage) require investments in processes underpinning exploitation, refinement and improvement to augment the firm’s efficiency at leveraging limited resources and historical advantages. These are synonymous with competence exploitation (Atuahene-Gima 2005; March 1991). The effectiveness of strategic entrepreneurship should therefore depend on how firms deploy competence exploration and competence exploitation.

Competence exploration, exploitation and strategic entrepreneurship

The acts of play, experimentation and discovery synonymous with competence exploration can shape the substructures and attitudes in the firm responsible for the identification of novel opportunities and creation of novel product-service solutions (March 1991). An emphasis on competence exploration should create the ‘correct’ conditions in the firm for entrepreneurial activities to take place, in theory.

Competence exploitation, however, captures the tendency of a firm to invest resources to refine and extend its existing knowledge, skills and routines (Atuahene-Gima 2005). In turn, substructures and attitudes are shaped that increase the efficiency of the firm at refining existing resources, honing current advantages and perfecting the ways in which ‘things are done’ in the firm (March 1991). A focus on competence exploitation should then create the ‘correct’ conditions for strategic activities to take place, in theory.

Managers tend to invest more resources into competence exploitation than competence exploration since the latter’s benefits are distant and uncertain. This bias can create a dysfunctional emphasis on one set of activities over another that becomes self-reinforcing over time (Atuahene-Gima 2005; Lantos 2006; Leonard-Barton 1992). Under this condition, the balance between entrepreneurial and strategic activity may shift, disrupting strategic entrepreneurship. Tushman and O’Reilly (1996) specify that competence exploration and exploitation generate differing behavioural and substructure demands (and accompanying investments), which creates dysfunction that compromises organisational endeavours. By extension, this tension may cause competence exploitation to disrupt the entrepreneurship components of strategic entrepreneurship and competence exploration to disrupt its strategy components, in theory.
The effect of competence exploration

Competence exploration and the ‘entrepreneurship’ of strategic entrepreneurship

The three activities associated with competence exploration – play, discovery and experimentation – appear supportive of an environment in which an entrepreneurial mindset can be developed. These activities embed flexibility, breakthrough innovation and renewal as values within the firm; values that in turn promote employees to initiate a mindset that values the search for opportunity and change over and above efforts to merely improve upon the status quo (Ireland, Hitt, and Sirmon 2003), even though these values put at risk the firm’s current activities, resources and product-market solutions (White et al. 2003).

Investments in these three activities improve the firm’s capacity to identify better entrepreneurial opportunities by improving employees’ and managers’ ability to interpret ambiguous market signals (McGrath and MacMillan 2000). Repeated competence exploration can then aid firms to better detect unmet needs and to sense the timing of when new goods or services become feasible or unexpectedly valuable to consumers (Atuahene-Gima 2005). Similarly, competence exploration encourages the analysis of new technologies by increasing managers’ propensity to notice and be sensitive to information about objects, incidents and changing patterns in the environment (Ardichvili, Page, and Wentling 2003). Experimenting in these ways encourages people in the firm to adopt radical new ideas or processes, in turn developing the creative processes that are critical to the successful execution of an entrepreneurial mindset.

By motivating acts of play, experimentation and discovery, investments in competence exploration also embed the substructures and activities necessary for the firm to adopt more inventive approaches to business and to regularly review whether its core competencies still constitute sources of superior value (Benner and Tushman 2003). As such, firms avoid the danger of allowing their core competencies or core strengths to become static and a hindrance to the entrepreneurial capacity of the firm. The entrepreneurial pursuit of opportunity is constrained by what firms can and cannot do. Competence exploration widens the range of activities a firm can undertake and is therefore likely to increase the firm’s opportunity alertness and entrepreneurial mindset. Thus:

Hypothesis 1a: Competence exploration is positively related to the entrepreneurial mindset component of strategic entrepreneurship.

McGrath (2001) posits that without innovativeness, the risk of managerial oversight to market change increases, but innovativeness cannot simply be implanted into firms by managers. Rather, the conditions within the firm must enable it. The experimentation features of competence exploration can generate the requisite conditions for innovativeness. For example, experimentation with emerging technologies to produce novel solutions that offer entirely new value to customers represents one path to develop the innovativeness of the firm (Atuahene-Gima 2005). HTC has been notably successful in exploiting emerging developments in electronics in the past decade, gaining a reputation for innovation in the smartphone market. Competence exploration requires firms to invest resources to acquire entirely new knowledge, skills and processes (Jansen, van den Bosch, and Volberda 2006). Through competence exploration then, the creative and innovating capacity of the firm are increased. In more process terms, the substructures and activities associated with competence exploration help to convert the firm’s latent creativity into realised creativity.

Over time firms need to confront collapsing capabilities (Li and Atuahene-Gima 2002). Competence exploration is one way in which the maintenance of competencies can be made dynamic. In turn, competence exploration enables firms to develop a greater range of creative solutions in time (White et al. 2003) and new alternatives that generate further new knowledge and skills.
to deploy towards emerging, rather than existing markets and technologies, producing radical rather than incremental innovations (Chandy and Tellis 1998). Higher levels of innovativeness emerge accordingly. Successful innovation ultimately depends on the extent to which firms renew and replace existing competencies, knowledge and resources, avoiding the dysfunctional rigidity effects of existing strategic assets (Leonard-Barton 1992). Thus:

**Hypothesis 1b**: Competence exploration is positively related to the innovating component of strategic entrepreneurship.

**Competence exploitation and the ‘strategy’ of strategic entrepreneurship**

Competence exploitation represents an investment in processes that join existing competencies across the firm together to create synergies which are then shared across the firm (Garcia, Calantone, and Levine 2003). Competence exploitation embeds experience-led refinement and the selection and reuse of existing routines as core firm values. These values in turn lead the firm to build on its existing competencies and associated portfolio of activities to steadily improve its current market position and current product advantages (Atuahene-Gima 2005). Therefore, investment in competence exploitation creates the necessary activities that promote efficient resource management and effective strategic management of resources (Sirmon, Hitt, and Ireland 2007).

Through refinement and extension of existing knowledge and skills, firms become more efficient, knowledgeable and skilful at bundling, structuring and leveraging existing resources to extract as much value and advantage as possible (Benner and Tushman 2003). Through competence exploitation, firms become increasingly adept at reconstructing their existing resource portfolios, leading to the investment of time and effort only in the most appropriate and profitable strategic actions (White et al. 2003).

Competence exploitation can also aid firms to sense the timing and the appropriate manner for acquiring and integrating new resources as current competencies may be used as leverage points to add new resources and competencies in the future (Danneels 2002). The processes underpinning competence exploitation can then act as coordination mechanisms directing the grouping of resources to efficiently link together firms’ resource portfolios with other resources (Jansen, van den Bosch, and Volberda 2006).

Through repeated acts of refinement and gradual improvement, firms’ existing activities, and the resource combinations underpinning them, become increasingly more reliable and efficient such that the firm’s ability to glean maximum value from its activities is markedly improved. Competence exploitation enables the firm to actively capture the benefits of its most useful resources and maintain its resource portfolio at an optimum level by adding in or omitting resources that do not contribute economically to the firm’s activities. Thus:

**Hypothesis 2a**: Competence exploitation is positively related to the strategic resource management component of strategic entrepreneurship.

Competitive advantage captures the ability of a firm to create more economic value than competitors (Barney and Hesterly 2006). Competence exploitation enhances efficiency and productivity through the search for solutions to market opportunities that are associated with the firm’s already-possessed experience (March 1991). It therefore enables the firm to specialise further in the areas
in which it already operates and reinforces its ability to fulfil customers’ needs in ever more efficient ways. By putting in place the set of activities and subsystems that enable the firm to become increasingly superior at its core activities, the firm’s ability to refine and execute competitive advantage should improve.

Competence exploitation embeds the refinement and improvement of existing organisational operations, competencies and activities as the firm’s central *modus operandi*. In doing so, the firm becomes more effective at using its existing assets and advantages to enhance profitability (Atuahene-Gima 2005). Competence exploitation further insulates the firm from investing an excessive amount of resources in activities with uncertain returns that might undermine current advantages (Atuahene-Gima 2005; Hughes, Hughes, and Morgan 2007). Rather, it rapidly expands the firm’s knowledge base and refines practices at little cost, which in turn support the firm’s efforts to enhance competitive advantage (Danneels 2002). Competence exploitation also reduces risk through incremental improvement of processes and routines that underpin current advantages (Benner and Tushman 2003). These improved routines become standardised best practices for the firm in time, further refining competitive advantage. Thus:

**Hypothesis 2b**: Competence exploitation is positively related to the competitive advantage component of strategic entrepreneurship.

*Alternative consequences of competence exploration and exploitation for strategic entrepreneurship*

In theory, the values of refinement, efficiency and gradual improvement contained within processes of competence exploitation appear antithetical to the principles of entrepreneurship because they imply a very different set of behaviours. One that promotes innovativeness and rule-bending through processes of discovery and experimentation (exploration) does not sit well with behaviours of refinement, incremental adaptation and efficiency (exploitation) (Hughes, Hughes, and Morgan 2007). In turn, the very different subtexts underpinning competence exploitation and entrepreneurship, coupled with the relentless pursuit of marginal value over and above newness, suggest that competence exploitation might undermine entrepreneurship over time – in theory at least. Competence exploitation places an overt focus on improving current routines creating attitudes that are increasingly concerned with efficiency and cost optimisation with little tolerance of risky new alternatives. These appear at odds with the cost-bearing and risk-bearing entrepreneurial search for novelty. Its primary features are therefore associated with incremental change through risk and uncertainty reduction (Gilbert 2006), which appear antithetical with firms’ entrepreneurial activities.

The refinement of current competencies to fine-tune value to current customers can offer opportunities for incremental change and improvement (Atuahene-Gima 2005), but firms that engage repeatedly in competence exploitation can become dysfunctional over time. As Hughes, Hughes, and Morgan (2007) argue, competence exploitation leads to implicit choices on firm processes, behaviours and resource allocations that are shaped around information processing systems and a costly and slow process of extensive knowledge search to refine present activities (March 1991). This is in contrast to the fast-moving experimentation, discovery and uncertainty-bearing actions associated with entrepreneurship. These conditions shape path dependency that can make it hard for firms to accept distant future markets.

Leonard-Barton (1992) argues that exploiting current competencies leads to new product projects that align with those competencies and hinder those lacking such alignment. Consequently, competence exploitation will lead to internal firm conditions changing and strengthening
to reflect these activities (March 1991), diminishing the presence of explorative processes and routines that support experimentation, play and discovery (Hughes, Hughes, and Morgan 2007). Therefore theory suggests that an excessive focus on competence exploitation appears antithetical with entrepreneurship endeavour. Thus:

**Hypothesis 3:** Competence exploitation is negatively related to the (a) entrepreneurial mindset and (b) innovation components of strategic entrepreneurship.

Competence exploration shapes new routines that can open new avenues, corridors and frontiers for organisational activity. However, excessive competence exploration can lead firms to suffer the costs of experimentation without gaining many of its benefits (March 1991). Although increased competence exploration might protect the firm from the risk of over-reliance, investment in competence exploration and its accompanying substructures and activities can distract firms from optimising value from its current resources and competitive advantages (Hughes, Hughes, and Morgan 2007); and its increased use can prevent firms from efficiently maintaining their existing product and service portfolios (Atuahene-Gima 2005). Continuous competence exploration can be costly to the firm since the firm may move rapidly from one idea to another without appropriately exploiting the knowledge and experience already possessed by the firm (Levinthal and March 1993). New products might therefore be underdeveloped, draw from incomplete resource bundles and fit poorly with customer needs offering little advantage in turn.

Exploration requires resources to be committed to research-led R&D tasks that pull resources away from existing operations; resources that cannot then be used to form more efficient and effective bundles or be leveraged to better execute current advantages. As such, the firm becomes capable of seeing new opportunities but incapable of extracting sufficient value from them. Excessive investment in competence exploration can diminish the routines within the firm to build efficient resource bundles that shape competitive advantage (March 1991). Competence exploration might then undermine, not reinforce, the synergy in and among current resources and competitive advantages. Thus:

**Hypothesis 4:** Competence exploration is negatively related to the (a) managing resources strategically and (b) executing competitive advantage components of strategic entrepreneurship.

**Research methodology**

The firm was selected as the level of analysis since strategic entrepreneurship is a firm-level phenomenon. Methodological issues related to the particular study were considered following the approach of previous scholars (e.g., Robson, Katsikeas, and Bello 2008). The chief executive officer (CEO) was identified as the most relevant source of information. CEOs are considered to be reliable sources of information on entrepreneurial and strategic issues within the firm and CEOs also possess overarching information on firm practices, processes and outcomes (Kumar, Stern, and Anderson 1993). Data were gathered from medium-to-large-sized firms operating in three technology-based industries in Greece. Strategic entrepreneurship constitutes a critical element of long-term success and survival in these industries since the environment’s turbulence imposes the need to undertake innovation while gaining important profits from existing operations. All data were collected during an eight-month period from January 2007 to September 2007.
Prior to data collection, an initial pilot test with 10 CEOs and an expert panel of academics was performed to validate the questionnaire measures in a period of one month. These initial 10 questionnaires were excluded from the sample and the rest of the data collection procedure. This process was used to improve the face and content validity of items. The pilot test and the expert panel led to revision of vague or improperly-phrased items. Following corrections, the items were found to be acceptable by the panel.

The selection of firms to participate in the study was obtained from ICAP data (2004), a highly regarded and reliable Greek business database. The total population of ICT, Pharmaceutical and Food/Beverage firms with more than 80 employees came to 331 companies. Following Dillman’s (1978) guidelines for the Total Design Method, an invitation letter was sent explaining the nature and the purpose of the study. The CEOs of the 331 companies agreed to participate. A total of 163 eligible responses were received, resulting in a 49.2% response rate. The final number of useful questionnaires consisted of 144 (respondents replied to all questions) with a final response rate of 43.5%. This response rate was achieved after three attempts (two mailings – physical and electronic – and a final round of phone calls).

To check for non-response bias, available firm characteristics from the ICAP database (size and total sales) were compared for both responding and non-responding firms. A t-test, based on the number of full-time employees and total sales, showed no significant differences ($p < 0.05$) between the two groups, thus indicating that no response bias was present in the sample. We also compared early and late respondents using a t-test procedure under the assumptions of both equal and unequal group variances. No significant differences ($p < 0.05$) were detected in the means of the study constructs between the two groups.

All items used to measure constructs were framed around seven-point Likert-type scales. Competence exploitation and competence exploration were measured with items taken directly from Atuahene-Gima (2005) and solicited information on the extent to which respondents’ firms had learned or developed new skills and processes and had refined existing ones (1 = no extent; 7 = to a great extent). No readily available set of scales existed to detect strategic entrepreneurship. However, Brown, Davidsson, and Wiklund (2001) present scales on constructs akin to the components of strategic entrepreneurship, having operationalised Stevenson’s model of entrepreneurial management, which contrasts entrepreneurial with administrative (strategic) behaviour. Brown, Davidsson, and Wiklund (2001) developed scales for strategic orientation, resource orientation, management structure, reward philosophy, growth orientation and entrepreneurial culture. The scales were reorganised to capture the four components of strategic entrepreneurship. This process was carried out first between the authors before presentation to academic and industry experts (as detailed previously) to examine for face and content validity. We adapted the scales into groups based on Ireland, Hitt, and Sirmon’s (2003) model and adapted them from semantic differential scales into 7-point Likert-type scales (1 = strongly disagree; 7 = strongly agree). The original scales had polar ends representing entrepreneurial behaviour and strategic behaviour but Ireland, Hitt, and Sirmon’s (2003) model does not specify that a firm is either more entrepreneurial or less strategic on a scale but rather specifies that a firm’s relative expertise at the entrepreneurial and strategic components of their model is what determines the degree of strategic entrepreneurship; hence the modification. Also, the formation of innovation scales were informed by those of Calantone, Cavusgil, and Zhao (2002) and Yalcinkaya, Calantone, and Griffith (2007), and competitive advantage scales were informed by those of Avlonitis, Papastathopoulou, and Gounaris (2001) and Atuahene-Gima (2005). Size was used as a control variable since it is a good proxy for the resources and capabilities available to the firm and to the depth of its knowledge and skills
base. All scales were subjected to principal component analysis and then to confirmatory factor analysis. The scales used are presented in Table 1.

A key informant data collection approach is widely used in organisational research but a single respondent survey can suffer common method bias. We used common methodological guidelines in an effort to reduce this problem and alleviate issues that may, but not necessarily will, arise from the motivation of the most knowledgeable key informant. We positioned questions in an unsystematic order, reduced the survey length, adopted neutral wording throughout, did not imply an ideal answer, provided detailed instructions to respondents, and pre-tested the measures and survey (Spector and Brannick 1995). Procedural remedies related to questionnaire design were also used (Podsakoff et al. 2003). First, a systematic questionnaire and measure development process was followed to ensure that items would be carefully constructed and clearly stated. Second, psychological separation of questions was used in the questionnaire. According to Podsakoff et al. (2003), psychological separation is an approach to demonstrate that the independent variable is not connected with or related to the measurement of the dependent variable and is recommended when it is not possible to gather data from different sources. As such, questions were grouped together and put under different sections to make it appear unrelated to participants, to reduce the possibility that respondents might establish a relationship between sections. Moreover, dependent variables were not placed last in the questionnaire. This decreases the probability that respondents will alter their responses once they have already moved further into the questionnaire. Last, participants were assured that anonymity and confidentiality would be maintained.

We then tested for common method bias using confirmatory factor analysis to perform the Harman one-factor test, which is the most widely used technique for this purpose (although this method is somewhat poor at controlling for method effects) (Podsakoff et al. 2003). We placed all of the variables into one confirmatory factor analysis and examined the fit indices to identify whether a single latent factor fit the data well (Podsakoff et al. 2003). If a single factor fits the data well, then common method bias exists. However, the test results prove otherwise: \( \chi^2 = 297.31 \), d.f. = 142, \( p < 0.001 \), RMSEA = 0.20, non-normed fit index (NNFI) = 0.77, comparative fit index (CFI) = 0.79, incremental fit index = 0.79, goodness of fit index (GFI) = 0.47. The \( \chi^2/\text{d.f.} \) ratio is in excess of 2.00, RMSEA is in excess of 0.08 and the NNFI, CFI, IFI and GFI statistics are also unacceptable (Hu and Bentler 1999). Accordingly, common method bias does not appear to be a problem (Podsakoff et al. 2003).

Table 2 illustrates a comparison between the correlation of the constructs and the square of average variance extracted for each construct. Table 2 reveals that the square of the AVE for each construct is greater than the correlation coefficients which suggest there is discriminant validity (Sarkar, Echambadi, and Harrison 2001).

**Results**

Using LISREL 8 with the maximum likelihood procedure and covariance matrix, we estimated a single measurement model. Table 1 contains the measures, factor loadings, Cronbach \( \alpha \)s, composite reliabilities (CR) and average variance explained (AVE). All factor loadings are acceptable, indicating convergent validity. The AVEs are acceptable (exceed 0.50) and the CRs are also acceptable (exceed 0.70) (Bagozzi, Yi, and Phillips 1991). Scale reliability was assessed using Cronbach \( \alpha \), which should exceed 0.50 (Hair et al. 1998). All values exceed this cut-off, indicating acceptable reliability. The model fit is strong (\( \chi^2 = 217.88 \); d.f. = 150; chi-square (\( \chi^2/\text{df} \)) = 1.45; \( p = 0.00025 \); RMSEA = 0.056; NFI = 0.927; NNFI = 0.965; CFI = 0.972; IFI = 0.973) (Hu and Bentler 1999).
Table 1. Scale characteristics

<table>
<thead>
<tr>
<th>Construct and items</th>
<th>Standardised factor loading</th>
<th>Cronbach α</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Entrepreneurial mindset: CR=0.66; AVE=0.50</strong></td>
<td>0.710</td>
<td></td>
</tr>
<tr>
<td>Please rate your agreement or disagreement with the following statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We have many more promising ideas than we have time and the resources to pursue</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Changes in the society at large often give us ideas for new products and services</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>We never experience a lack of ideas that we can convert into profitable products/services</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td><strong>Managing resources strategically: CR=0.60; AVE=0.50</strong></td>
<td>0.504</td>
<td></td>
</tr>
<tr>
<td>Please rate your agreement or disagreement with the following statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>As we define our strategies, our major concern is how to best utilise the resources we control</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>Since our objective is to use our resources, we will usually invest heavily and rapidly</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td><strong>Innovation: CR=0.85; AVE=0.67</strong></td>
<td>0.846</td>
<td></td>
</tr>
<tr>
<td>Please rate your agreement or disagreement with the following statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We constantly seek to enhance current products with continuous improvements</td>
<td>0.79</td>
<td></td>
</tr>
<tr>
<td>We constantly seek to generate new products and services</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td>We constantly seek out business opportunities to exploit</td>
<td>0.78</td>
<td></td>
</tr>
<tr>
<td><strong>Competitive advantage: CR=0.76 AVE=0.63</strong></td>
<td>0.658</td>
<td></td>
</tr>
<tr>
<td>Please rate your agreement or disagreement with the following statements:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All our products and services must contribute value or will be culled</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>We constantly seek ways to reinforce competitive advantage</td>
<td>0.98</td>
<td></td>
</tr>
<tr>
<td><strong>Competence exploitation: CR=0.86 AVE=0.55</strong></td>
<td>0.882</td>
<td></td>
</tr>
<tr>
<td>Over the last three years, to what extent has your firm:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Upgraded current knowledge and skills for familiar products and technologies?</td>
<td>0.74</td>
<td></td>
</tr>
<tr>
<td>Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations?</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Enhanced competencies in searching for solutions to customer problems that are near to existing rather than completely new solutions?</td>
<td>0.55</td>
<td></td>
</tr>
<tr>
<td>Upgraded skills in product development processes in which the firm already possesses significant experience?</td>
<td>0.76</td>
<td></td>
</tr>
<tr>
<td>Strengthened our knowledge and skills for projects that improve efficiency of existing innovation activities?</td>
<td>0.87</td>
<td></td>
</tr>
<tr>
<td><strong>Competence exploration: CR=0.90 AVE=0.67</strong></td>
<td>0.856</td>
<td></td>
</tr>
<tr>
<td>Over the last three years, to what extent has your firm:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learned product development skills and processes (such as product design, prototyping new products, timing of new product introductions, and customising products for local markets) entirely new to the industry?</td>
<td>0.69</td>
<td></td>
</tr>
<tr>
<td>Acquired entirely new managerial and organisational skills that are important for innovation (such as forecasting technological and customer trends; identifying emerging markets and technologies; coordinating and integrating R&amp;D; marketing, manufacturing, and other functions; managing the product development process)?</td>
<td>0.89</td>
<td></td>
</tr>
<tr>
<td>Learned new skills in areas such as funding new technology, staffing R&amp;D function, training and development of R&amp;D, and engineering personnel for the first time?</td>
<td>0.84</td>
<td></td>
</tr>
<tr>
<td>Strengthened innovation skills in areas where it had no prior experience?</td>
<td>0.83</td>
<td></td>
</tr>
</tbody>
</table>

*a*Composite reliability; *b*Average variance extracted.
Table 2. Correlations and descriptive statistics

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Entrepreneurial mindset</th>
<th>Managing resources strategically</th>
<th>Innovation</th>
<th>Competitive advantage</th>
<th>Competence exploitation</th>
<th>Competence exploration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entrepreneurial mindset</td>
<td>0.40^a</td>
<td>0.005</td>
<td>0.22</td>
<td>0.073</td>
<td>0.18</td>
<td>0.14</td>
</tr>
<tr>
<td>Managing resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>strategically</td>
<td>0.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation</td>
<td>0.073</td>
<td>0.21</td>
<td>0.67</td>
<td>0.31</td>
<td>0.18</td>
<td>0.55</td>
</tr>
<tr>
<td>Competitive advantage</td>
<td>0.073</td>
<td>0.21</td>
<td>0.67</td>
<td>0.31</td>
<td>0.18</td>
<td>0.55</td>
</tr>
<tr>
<td>Competence exploitation</td>
<td>0.18</td>
<td>0.14</td>
<td>0.33</td>
<td>0.18</td>
<td>0.49</td>
<td>0.67</td>
</tr>
<tr>
<td>Competence exploration</td>
<td>0.14</td>
<td>0.13</td>
<td>0.31</td>
<td>0.22</td>
<td>0.49</td>
<td>0.67</td>
</tr>
<tr>
<td>Mean</td>
<td>4.5995</td>
<td>5.0104</td>
<td>5.5787</td>
<td>5.2500</td>
<td>5.2542</td>
<td>4.8628</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>1.09003</td>
<td>0.97426</td>
<td>1.06800</td>
<td>1.12660</td>
<td>.91978</td>
<td>1.26644</td>
</tr>
</tbody>
</table>

^aCoefficients on the diagonal are square roots of the average variance extracted of each scale.

Table 3. Path analysis

<table>
<thead>
<tr>
<th>Path</th>
<th>Hypothesised relationship</th>
<th>t-value</th>
<th>β value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence exploration</td>
<td>Entrepreneurial mindset</td>
<td>H1a +</td>
<td>3.56**</td>
</tr>
<tr>
<td>Competence exploration</td>
<td>Creating innovation</td>
<td>H1b +</td>
<td>5.65***</td>
</tr>
<tr>
<td>Competence exploitation</td>
<td>Managing resources</td>
<td>H2a +</td>
<td>2.81*</td>
</tr>
<tr>
<td>Competence exploitation</td>
<td>Executing competitive</td>
<td>H2b +</td>
<td>2.70*</td>
</tr>
<tr>
<td>advantage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Competence exploitation</td>
<td>Entrepreneurial mindset</td>
<td>H3a −</td>
<td>3.85**</td>
</tr>
<tr>
<td>Competence exploitation</td>
<td>Creating innovation</td>
<td>H3b −</td>
<td>5.91***</td>
</tr>
<tr>
<td>Competence exploration</td>
<td>Managing resources</td>
<td>H4a −</td>
<td>2.57*</td>
</tr>
<tr>
<td>Competence exploration</td>
<td>Executing competitive</td>
<td>H4b −</td>
<td>2.80*</td>
</tr>
<tr>
<td>advantage</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

We ran two structural equation models. The first tested competence exploration onto entrepreneurial mindset and innovation, and tested competence exploitation onto managing resources and competitive advantage ($\chi^2 = 264.25; \text{d.f.} = 160; \chi^2/\text{d.f.} = 1.65; p = 0.00000; \text{RMSEA} = 0.067; \text{NFI} = 0.911; \text{NNFI} = 0.952; \text{CFI} = 0.960; \text{IFI} = 0.960$). The second tested exploitation onto entrepreneurial mindset and innovation and exploration onto managing resources and competitive advantage ($\chi^2 = 243.16; \text{d.f.} = 160; p = 0.000000; \text{RMSEA} = 0.060; \text{NFI} = 0.915; \text{NNFI} = 0.957; \text{IFI} = 0.964; \text{CFI} = 0.963$).

Table 3 demonstrates that the paths for Hypotheses 1a, 1b, 2a and 2b were positive and significant. In particular, competence exploration was found to positively and significantly affect entrepreneurial mindset and innovation ($t = 2.49$ and $5.61$ respectively). Thus, Hypotheses 1a and 1b are supported. Similarly, competence exploitation was found to positively and significantly affect managing resources strategically and executing competitive advantages ($t = 2.23$ and $3.48$ respectively). However, the second model demonstrates that Hypotheses 3a, 3b, 4a and 4b are not
supported. The negative relationships predicted do not hold and instead competence exploitation was found to positively and significantly affect entrepreneurial mindset and creating innovation ($t = 3.69$ and $5.85$ respectively). Also, competence exploration was found to positively and significantly affect the strategic management of resources and the execution of competitive advantages ($t = 2.11$ and $2.65$ respectively). Size was found to have little overall impact on the process of strategic entrepreneurship ($t_{model 1} = -1.49$, $-1.17$, $1.57$ and $1.17$; $t_{model 2} = -1.52$, $-1.32$, $0.99$ and $1.89$), which is consistent with Ireland, Hitt, and Sirmon’s (2003) argument that strategic entrepreneurship applies to firms irrespective of size.

Discussion and conclusions

This study attempts to sharpen understanding of the relationship between competence exploration, competence exploitation and strategic entrepreneurship by examining whether competence exploration solely influences the entrepreneurial side of strategic entrepreneurship, whether competence exploitation solely impacts its strategic side, and whether the purported dysfunctional effects of the exploration–exploitation interface would affect strategic entrepreneurship. Two important contributions to scholarship emerge from the study findings.

First, this study clarifies the role played by competence exploration and exploitation in the successful strategic entrepreneurship. We demonstrate that strategic entrepreneurship’s two sides, although characterised by different features in theory, can benefit from similar enabling mechanisms. Competence exploration and exploitation, serving as the two enabling mechanisms, create the substructure of routines and processes through which strategic entrepreneurship can be deployed. It is these routines that can leverage entrepreneurial and strategic activities associated with strategic entrepreneurship. Therefore, the study contributes new knowledge towards the organisational arrangements that can aid strategic entrepreneurship efforts. Our study is among the few to empirically examine the effects of these important organisational constructs on strategic entrepreneurship, despite calls for such studies (Ireland and Webb 2009; Schindehutte and Morris 2009).

Second, we find that both competence exploration and exploitation positively influence all four components of strategic entrepreneurship as proposed by Ireland, Hitt, and Sirmon (2003). Thus, we find no evidence that the dysfunctional effect that can occur between exploration and exploitation in theory (March 1991) materialised with respect to strategic entrepreneurship. This finding adds context to those of Colbert (2004) and He and Wong (2004) that although competence exploration and exploitation may positively affect firms individually, their interrelationship can maximise the benefits acquired beyond those provided by each one individually. Thus we contribute new knowledge of the antecedents of strategic entrepreneurship and new insight into the relationship between competence exploration and competence exploitation, offering what appears to be an exception to the dysfunction argument purported in theory in this instance.

However, we believe there is reason to take caution with these new insights. Although competence exploration and exploitation do not appear to have the negative effects on their expected antithetical constructs (strategy and entrepreneurship respectively) as theory led us to believe, we can be sure that the type of activities they promote are different. In turn, what we cannot say from our findings is whether competence exploitation makes the firm effective at strategic entrepreneurship but on a trajectory that is still built around the firm’s existing product lines. In effect, the risk of core rigidity and longer-term problems in sustaining value creation are not diminished. The same problem applies to competence exploration in that it supports strategic entrepreneurship but on a trajectory related entirely to new product novelty, discontinuous change
and radical upheaval. Questions then remain over the firm’s longer-term ability to appropriate sufficient value with sustainable advantages. The overarching question then is what happens to the performance of firms over time when they follow these trajectories? Despite our contribution to understanding strategic entrepreneurship in this respect, we cannot answer this question from our findings.

Managerial implications

Competence exploration and competence exploitation both lead firms to implement unique routines and substructures that prepare the firm for the task of entrepreneurially pursing new opportunities while strategically managing the complexity of this endeavour. Simply engaging in the process of strategic entrepreneurship without these substructures in place could cause the process to fail because the firm would be switching between very different and often contradictory entrepreneurial and strategic activities without the appropriate structures, routines and processes in place to manage these activities. Managers should prepare their firms properly before pursuing strategic entrepreneurship by benchmarking competence exploration and competence exploitation, and the extent to which their related substructures and routines have proliferated throughout the firm.

Managers should recognise the different skills required to successfully implement competence exploration or exploitation and seek to detect the current status of the firm in this regard. This is particularly important given that exploration and exploitation are two ends of a continuum that compete for limited firm resources (Lavie and Rosenkopf 2006). Constant monitoring and re-adjustment of the relationship between exploration and exploitation and leveraging structures for tightening or loosening activities ought to create the necessary cohesion that will aid strategic entrepreneurship in turn. Managers, therefore, should also diagnose and benchmark the firm in relation to strategic entrepreneurship to determine its readiness to implement these activities and to isolate where any subsequent investments may be needed.

Limitations and future research

Some limitations affect this work. First, the model is underspecified such that additional missing variables may explain the nature of the strategic entrepreneurship process. We do not consider the effect of contextual conditions on the strategic entrepreneurship process, for example. Also, industry structure and context might impact on the volume and nature of opportunities surrounding firms and may motivate or discourage strategic entrepreneurship accordingly. Second, we examine only two antecedents of strategic entrepreneurship. Future studies could consider additional antecedents that might further promote strategic entrepreneurship. Our knowledge might also improve from the analysis of specific competence sets that impinge on strategic entrepreneurship activities.

Third, exploitation and exploration may only partially capture the tensions of combining both ‘strategy’ and ‘entrepreneurship’. That said, a weakness associated with current frameworks of strategic entrepreneurship is they tend to be too generic such that tensions among its components cannot be adequately captured. The field would benefit from additional conceptual investigation. In turn, this may lead scholars towards alternative operationalisations of strategic entrepreneurship.

Fourth, this study did not test the performance implications of strategic entrepreneurship. An assumption underpinning strategic entrepreneurship is that its gains are synergistically greater than firms specialising in either entrepreneurial or strategic approaches separately. Our work
The effect of competence exploration implies that these gains may be due to the supporting infrastructure in place, that is, sufficient competence exploration and competence exploitation. However, the question of whether such investments will generate greater performance rewards needs empirical analysis.

Fifth, capturing the perceptions of multiple informants is potentially a better strategy for data generation, although studies do suggest that selecting an appropriate key informant helps to alleviate some of the problems that might occur (Huber and Power 1985). Finally, we obtained data from a particular setting. Extending the model into a multi-country context could enhance generalisation and understanding of the issues addressed herein.

Acknowledgment

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References


