



Being entrepreneurial and market driven: implications for company performance

Entrepreneurial
and market
driven

125

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Abstract

Purpose – The purpose of this paper is to examine empirically the interaction between entrepreneurial orientation (EO) and market orientation and its effect on performance in both high and low technology industries.

Design/methodology/approach – The paper proposes that being entrepreneurial and market-driven stem from two distinct organizational capabilities that interact to influence subsequent firm performance.

Findings – Data from 457 manufacturing firms show that the interaction effect is significant only in high technology industries.

Research limitations/implications – The results encourage future research on the nexus of opportunity recognition and entrepreneurial behavior in established firms embedded in organizational routines.

Originality/value – The paper shows that managers in high technology industries would benefit from developing capabilities and implementing systems that augment their firms' market orientation. Market orientation provides an important means to harness the firm's EO, an important means of achieving growth and profitability.

Keywords Entrepreneurialism, Market driven production, Market orientation, Organizational performance

Paper type Research paper

Over the past two decades, researchers have given considerable attention to revitalizing established companies by infusing entrepreneurship throughout operations (Burgelman and Grove, 2007; Sathé, 2003). Researchers have examined the structural and contextual factors (e.g. environment) that influence entrepreneurial abilities of these firms (Covin and Slevin, 1989; Lumpkin and Dess, 2001). They have also studied the contribution of entrepreneurship to a firm's performance (Keh *et al.*, 2007). Entrepreneurial firms are likely to increase new product development, facilitate new business creation, and reenergize existing operations (Pinchot, 1985). This growing body of research highlights the importance of firm's "entrepreneurial orientation" (EO), reflected as a propensity to take risks, to innovate and to be proactive

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(Lumpkin and Dess, 1996; Green *et al.*, Covin and Slevin, 2008). EO has been linked to key organizational outcomes such as innovativeness, strategic flexibility and improved firm performance (Keh *et al.*, 2007; Miller, 1983; Wiklund, 1999; Lyon *et al.*, 2000). Because EO manifests itself differently in different settings and its effects on performance vary from one industry type to another, researchers have called for studies that examine the organizational practices and conditions under which EO improves financial performance (Dess *et al.*, 1997; Baden-Fuller and Stopford, 1994).

Recent parallel developments in the study of organizational capabilities provide an interesting insight into the entrepreneurial process. Some empirical studies capture a firm's capabilities to track market changes such as competitor and consumer behavior to help create new products and services. This market-driven capability, referred to usually as "market orientation" is defined as a firm's ability to track and respond to ongoing changes in the marketplace through intelligence generation and information dissemination activities (Im *et al.*, 2008; Jaworski and Kohli, 1993; Keh *et al.*, 2007; Slater and Narver, 1999). This body of literature suggests an overlap between a firm's market orientation and its entrepreneurial orientation (Atuahene-Gima and Ko, 2001; Hult and Ketchen, 2001). In this article, we suggest that EO and market orientation reflect complementary organizational capabilities, where the routines that support an organization's market-orientation would intensify the relationship between its EO and subsequent financial performance.

Entrepreneurship and strategy literatures have examined how firms adapt to environmental change by recognizing and exploiting the opportunities created by uncertainties as a means of wealth creation (Burgelman and Grove, 2007; Hitt *et al.*, 2001; Sathé, 2003). A key path to opportunity recognition and subsequent exploitation, specifically with regard to present and future customer needs, is manifested in a firm's market orientation. Market-oriented businesses usually seek to understand customers' expressed and latent needs and develop superior solutions to meet these needs (Grinstein, 2008; Im *et al.*, 2008; Kohli and Jaworski, 1990; Slater and Narver, 1995). While some researchers argue that firms with a strong market orientation may over-emphasize current customer needs possibly overlooking future products and growth opportunities (Christensen and Bower, 1996, Connor, 1999), other researchers disagree (Slater and Narver, 1998). Though some studies have addressed this construct, researchers call for further examination of the interaction between market orientation and other organizational processes and its influence on firm performance (Slater and Narver, 1999; Song *et al.*, 2008; Stam and Elfring, 2008; Wang, 2008).

Further, prior studies have not investigated the contingent nature of industry effects on the relationship between EO, market orientation and firm performance. For example, while many high technology industries enjoy high profitability, they tend to be high velocity industries that favor agile and proactive strategic choices. Low technology industries, on the other hand, may not always provide opportunities for such rapid growth or high profitability (Grant, 1998). High and low technology industries offer contrasting settings that could reveal significantly different relationships between the firm's EO, market orientation and financial performance.

Therefore, this study empirically examines the interaction between EO and market orientation and its effect on performance in both high and low technology industries. The study proposes that a firm's gains from EO will be significantly higher when it

adopts an effective marketing orientation and this effect will be significantly higher in high technology industries rather than in low technology industries.

The remainder of this article is organized as follows. First, we discuss entrepreneurship in established firms. Then, we identify a firm's market orientation as reflective of an organizational capability that serves to complement its entrepreneurial orientation. Here, we posit that the interaction of entrepreneurial and market orientations would lead to improved financial performance. Also, we argue that such an orientation would be more salient in technology-intensive industries than in less technology-intensive industries. Subsequently, we present the data and explain the process by which these hypotheses are tested and elaborate upon the findings and its implications for research and practice.

Theory development

Entrepreneurial orientation

Entrepreneurial opportunities arise from innovation and technological changes, industry upheaval, demographic shifts and macro-economic changes among others (Zahra, 2008). Based on the Austrian economic perspectives, Kirzner (1997) suggests that the discovery of new profit-making opportunities arises from an entrepreneur's "alertness" to such opportunities rather than a series of accidents of chance. Kirzner notes, "an entrepreneurial attitude is one which is always ready to be surprised, always ready to take the steps needed to profit by such motives" (1997, p. 72). Therefore, the key to entrepreneurial success is a disposition to alertness for new opportunities and the ability to quickly act upon revealed opportunities (Alvarez and Barney, 2007).

Building on Austrian economics, entrepreneurship scholars have advanced frameworks on the sources, discovery, exploitation of entrepreneurial opportunities and their consequences (Kirzner, 1997; Shane and Venkataraman, 2000). Empirical studies suggest that the ability to recognize opportunities and act upon them is quintessential to successful financial performance (Ahuja and Lampert, 2001). Consequently, entrepreneurial firms usually engage in strategic management processes such as planning and environmental scanning that enable them to recognize and exploit emerging growth opportunities (Barringer and Bluedorn, 1999). These organizational processes or routines help firms develop the capability necessary to discover and respond to new market opportunities.

Teece, Pisano and Shuen (1997) suggest that firm-specific capabilities can be sources of advantage and the combinations of competences and resources can be developed and deployed to increase economic profits. This theoretical perspective, the dynamic capabilities view, has generated scholarly attention in recent years to explain organizational change, innovation and new market entry (King and Tucci, 2002; Zahra *et al.*, 2006). Dynamic capabilities are change-oriented capabilities that enable corporations to evolve and reconfigure their resource base to meet evolving competitive scenarios (Amit and Zott, 2001). Organizational capabilities are embedded in firm routines and those routines are a product of the organization as an entire system (Collis, 1994). Organizational capabilities are not only manifestations of observable corporate structures and processes, but also reside in the corporate culture and the network of employee relations that cannot be attributed to or reduced to a single individual (Teece, 1982). In sum, capabilities embedded in firm routines and

processes that allow organizations to adapt and evolve to changing competitive needs are considered to be dynamic capabilities (Zahra *et al.*, 2006).

Though the entrepreneurship and strategy literatures have tended to evolve somewhat independently of each other, recent efforts suggest an overlap in research domains especially with regard to entrepreneurship in established organizations (Hitt *et al.*, 2001). In established organizations, corporate entrepreneurship researchers have examined venturing and renewal of existing operations by refocusing their efforts (Stopford and Baden-Fuller, 1994). Also, there are elements of theoretical relevance captured by the dynamic capabilities that is clearly applicable to entrepreneurship in established organizations[1].

First, both dynamic capabilities and corporate entrepreneurship emphasize organizational change and renewal (Zahra *et al.*, 2006). Dynamic capabilities stress the importance of organizational routines that comprise firm-specific capabilities and competences in domain areas such as production, marketing or information technologies (Eisenhardt and Martin, 2000). Firms can build anew or renew their routines, skills, and competences over time and this allows organizations to change. Corporate entrepreneurship also reflects change from the perspective of innovation that transforms the profile or identity of the organization over time by redefining its product portfolio or the market that it serves (Baden-Fuller and Stopford, 1994). The dynamic capabilities perspective is broad-based in its approach and can be applied to the corporate entrepreneurship context.

Second, both research streams emphasize performance outcomes. The dynamic capabilities perspective stresses economic rents or profitability while the entrepreneurship literature may emphasize venture growth over economic profit (Shane and Venkataraman, 2000). Though some researchers suggest that entrepreneurship is about venture creation, strategic management is about how an advantage is maintained from what is already established and created (Venkataraman and Sarasvathy, 2001). Both research domains emphasize wealth creation particularly in established organizations (Hitt *et al.*, 2001).

In established organizations, it is then possible to suggest that being entrepreneurial requires certain dynamic capabilities be embedded in organizational routines that allow firms to continually search, recognize, and exploit new opportunities. Recognition and exploitation of opportunities is the quintessential role played by entrepreneurs (Kirzner, 1979). In established firms, such opportunities may lead to refocusing the organization's value-creating activities (Burgelman and Grove, 2007; Sathe, 2003; Stopford and Baden-Fuller, 1994) that generate subsequent economic returns and maximizes shareholder wealth.

In summary, being entrepreneurial in established firms implies that these firms have superior capabilities to seek out and exploit new opportunities. Entrepreneurial alertness involves the ability to see opportunities that others may not perceive in the same situation (Alvarez and Barney, 2007). Such alertness, in established firms, may possibly be developed and embedded within firm routines and processes that allow organizations to change (Zahra, 2008; Amit and Zott, 2001). Therefore, firms that develop capabilities in opportunity recognition and exploitation are likely to generate greater wealth than firms that do not possess such capabilities.

Market orientation as an organization capability

Parallel to the evolution of behavioral research in entrepreneurship, scholars have developed the market orientation construct (Im *et al.*, 2008; Laforet, 2008; Day, 1999; Kohli and Jaworski, 1990; Slater and Narver, 1995). An effective market orientation, as portrayed in these studies, consists of three dimensions:

- (1) an organizational system that allows the firm to track the changes in its markets (intelligence generation);
- (2) information dissemination within the firm; and
- (3) responsiveness to the market (Kohli and Jaworski, 1990).

Researchers have studied the antecedents, nature, and outcomes of a firm's market orientation (Im *et al.*, 2008; Kohli *et al.*, 1993; Laforet, 2008; Narver and Slater, 1990; Wrenn, 1997). As a result, a firm with a strong market orientation is likely to understand its customers' needs, both expressed and latent, and address those needs with the intention of creating superior customer value.

Market orientation reflects many of the characteristics of a dynamic capability. There are tangible routines that underlie each dimension of a firm's market orientation. For example, intelligence generation includes routines to search and disseminate information within the organization. The sum of these routines allows firms to recognize market opportunities. Though market orientation may be akin to being customer-led (Connor, 1999), marketing researchers disagree (Slater and Narver, 1999). These authors argue that industry and customer foresight are reflected in a firm's market orientation. That is, firms with high market orientation recognize not only customers' unsatisfied needs but also recognize industry trends and competitor actions. Therefore, market-oriented firms have developed underlying organizational routines and processes that allow them to track market changes and predict evolving customer needs.

Some studies report that market orientation is a significant predictor of intermediate organizational outcomes such as innovative capacity (Grinstein, 2008; Hurley and Hult, 1998), new product development (Lukas and Ferrell, 2000), and new product performance (Atuahene-Gima, 1995). Hult and Ketchen (2001) suggest that market orientation, entrepreneurship, innovativeness and organizational learning constitute resources that collectively contribute to the creation of a unique resource, termed as positional advantage, which eventually leads to superior financial performance. Some studies report a significant relationship between market orientation and financial performance (Keh *et al.*, 2008; Moreno and Casillas, 2008; Olavarrieta and Friedmann, 2008; Pelham, 1999; Slater and Narver, 2000; Stam and Elfiring, 2008; Wang, 2008). Thus, consistent with the literature just cited, market orientation is expected to positively influence a firm's financial performance.

The interaction of entrepreneurial and market orientations

EO is a popular construct that captures a firm's disposition to entrepreneurship (Lumpkin and Dess, 1996). It reflects a firm's ability to be proactive, take risks and be innovative in their operations. Though some studies find a positive relationship between EO and performance (Wiklund, 1999), most empirical studies report a tenuous relationship between EO and firm performance that is contingent upon the firm's internal and external context. For instance, in one of the earliest empirical studies,

Covin and Slevin (1989) found that the effect of EO on firm performance was contingent on its organizational structure. They concluded that while the direct effect of EO on performance was statistically non-significant, firms that had organic structures exhibited a statistically significant relationship between EO and performance than firms with mechanistic organizational structures.

Zahra (1993) also found that the effect of EO on performance was moderated by the firm's perceptions of its competitive environments. Zahra and Covin (1995) validated and extended these findings, concluding that the EO-performance relationship varied based upon the firm's environment. Yet, other factors could influence this relationship, leading some researchers to observe that little is known about the variables through which EO influences a company's future financial performance (Covin and Miles, 1999).

This study proposes that market orientation captures a firm's routines and processes to recognize market opportunities and this capability is likely to strengthen a firm's entrepreneurial abilities. Day (1994) observes that market orientation reflects a systemic effort by firms to acquire information about their customers and their competitive market and to integrate this information into their strategic planning process. By doing so, these firms can recognize pending changes in their markets and capitalize upon emerging opportunities (Day, 1999; Slater and Narver, 2000). Consistent with this logic, Matsuno and Mentzer (2000) found that the prospector archetype (Miles and Snow, 1978) benefits by an increase in market orientation. Prospectors are entrepreneurial firms that emphasize marketing by identifying new market niches, studying customer needs, and being responsive to changing market conditions (Miles and Snow, 1978). Thus, it is likely that a firm with a strong EO would benefit from a strong market orientation.

Some researchers have also discussed the importance of market orientation for understanding a firm's entrepreneurial activities. For example, in a study of 181 business units of multinational corporations, Hult and Ketchen (2001) suggest that the relationship between market orientation and performance is not linear but rather embedded in more complex relationships, such as a firm's EO. However, these authors do not test for the interaction between entrepreneurship, market orientation and performance. Alternatively, Atuahene-Gima and Ko (2001), in a study of 120 large Australian firms, found that the interaction between EO and market-oriented firms increased product performance but do not address their influence on financial performance. Therefore, some research has considered the possibility that both EO and market orientation can co-exist but do not capture their influence on each other.

Also, the entrepreneurship literature suggests that the entrepreneurial function involves the ability to identify and exploit opportunities (Kirzner, 1979,1997; Shane, 2001; Shane and Venkataraman, 2000). Market orientation, which involves intelligence gathering and trend spotting, can be a vehicle of opportunity identification (Slater and Narver, 1999, 2000). The ability to exploit the opportunity will rest on a firm's EO or its ability to be proactive, innovative, and risk-taking associated with such opportunities (Lumpkin and Dess, 1996; Miller, 1983). If we consider market orientation as reflective of routines that can be developed into an organizational capability, then it is likely that firms that capitalize upon this capability with their entrepreneurial alertness and instinct for opportunity exploitation are likely to create wealth from such integration. Therefore, insights from both the marketing and entrepreneurship literatures would suggest that firms with a high market orientation are likely to identify opportunities

but firms with a high EO are likely to exploit such opportunities and achieve superior financial performance. Hence:

- H1.* Firms with strong market and entrepreneurial orientations will enjoy greater wealth creation than those that have low orientations. Specifically, the interaction effect between market orientation and EO will positively influence subsequent financial performance.

The influence of industry context

Some studies show that the EO-performance relationship is contingent upon a firm's industry context and its associated level of technological opportunities (Zahra, 1996), turbulence, and hostility (Zahra and Covin, 1995). High technology firms are more likely to exhibit higher levels of EO than their counterparts in low technology industries. For instance, Prescott (1986) concludes that environmental characteristics influenced the strength of the relationship between strategy and performance. In a similar vein, this study suggests that the strength of the contingent relationship between EO, market orientation and performance is likely to be stronger in high technology industries than in low technology firms.

Market orientation allows firms to track changes in customer preferences, competitor products, and industry trends (Jaworski and Kohli, 1993). It is possible that the need for a strong market orientation may decrease as the complexity and turbulence of the industry decreases because customer preferences and industry change is relatively stable. Contrary to expectations, a survey of managers in business units of large organizations across multiple industries finds that measures of perceived environmental turbulence and competitive intensity are not significant moderators of the market orientation-company performance relationship, prompting the authors to claim that this relationship is robust across market contexts (Jaworski and Kohli, 1993).

As firms in different industry settings might benefit from having a strong market orientation, this study proposes that high technology firms are likely to gain more from developing and nurturing this orientation than low technology firms. Firms are unlikely to develop dynamic capabilities to change unless a clear need for such change exists. The need for change-oriented capabilities is likely to assume prominence in competitive or turbulent environments (Eisenhardt and Martin, 2000; King and Tucci, 2002; Teece *et al.*, 1997).

High technology industries, though risky, offer more opportunities for growth, expansion and profitability than low technology industries (Zahra, 2008). An effective market orientation can enable firms to better leverage their entrepreneurial activities in a high rather than a low technology industry. Also, firms in low technology industries are unlikely to exhibit high EO, decreasing the likelihood of a significant interaction effect. Therefore, we posit that:

- H2.* Industry context will enhance or mitigate the strength of the influence of market and entrepreneurial orientations on financial performance. Specifically, the interaction effect between market orientation and EO to influence subsequent financial performance is likely to be stronger in firms operating in high technology industries than in firms operating in low technology industries.

Method*Sample*

To test the study's hypotheses, a mail survey targeted firms in five US states: Georgia, North Carolina, South Carolina, Tennessee, and Virginia. The survey was mailed to firms that have been in business for at least three years, avoiding the liability of newness associated with young firms. Firms were selected from five high and five low technology industries, representing ten two-digit SICs (for a total of 49 four-digit SICs). A total of 2379 companies were identified from state directories. Two mailings targeted these firms' CEOs or highest-ranking officers, generating 536 completed responses. This represented an overall response rate of 23 percent. Responding and non-responding companies were compared based on age and size (total number of employees). *T*-tests revealed no significant differences between the two groups of firms. The χ^2 test also showed no significant associations between responding and non-responding firms by state or industry type (low vs high technology).

Two additional steps were taken to establish the validity of the data. First, a copy of the survey was mailed to a second manager in each of the 536 responding companies. This process yielded 157 replies, which was then correlated with the responses received from the CEOs or highest ranking officials. The correlations for EO ($r = .62$) and market orientation ($r = .67$) were statistically significant ($p < .001$), providing an indication of significant inter-rater reliability. Second, an orthogonal factor analysis that was performed on all the study's variables produced multiple significant factors with eigenvalues above unity. Following Podsakoff and Organ (1986), we concluded that source bias was not a serious problem in this study.

Measures

Dependent variable. Firm performance was measured by the firm's return on assets (ROA), collected three years after the initial survey data collection. Data for ROA came from multiple sources, including COMPUSTAT as well as company and state publications. Missing data on individual firms' ROA reduced the sample to 457. ROA is a standard measure of firm performance used to evaluate the effects of a firm's strategic activities (Wood and LaForge, 1979).

Independent variables. Measures were developed also to capture EO, market orientation and industry type, as described next.

Entrepreneurial orientation. EO was measured using the seven-item index developed and validated by other studies (Miller, 1983; Miller and Friesen, 1982). This measure conceptualized EO as consisting of three dimensions: proactiveness, risk taking and innovation. Proactiveness meant that the firm was aggressive in its pursuit of its competitive priorities and goals, surpassing its rivals in this regard. Risk taking indicated a strong disposition to support innovative and experimental projects whose payoff was uncertain. Innovation meant that the firm was committed to developing more new products (goods and services) and introducing them to the markets, often well ahead of the competition. This measure has been widely used and validated in prior studies to capture EO (Covin and Slevin, 1989; Green, Covin and; Slevin, 2008; Keh *et al.*, 2007; Zahra and Covin, 1995). Managers indicated their level of agreement with each of Miller's (1983) seven items using a 5-point score (1 = Very Untrue vs 5 = Very True; managers were also given the option to circle "not applicable"). Average scores for the seven items were then used in the analysis. Cronbach's α was 0.71.

Market orientation. It was measured using the 20-item index developed by Kohli *et al.* (1993). This measure covered three areas: generation of market intelligence information, dissemination of market information, and responsiveness to the market. The numeric mean of the items on the scale were used in the analysis. Atuahene-Gima and Ko (2001) observed that the measure had several advantages and effectively captured organizational responses to the market, the firm's attention to customer needs, and strategic moves by competitors. Cronbach's α was 0.73.

High and low technology industry classification. Defining high technology industries has been the subject of debate in the literature (Oakey *et al.*, 1988). There is consensus, however, that these industries invest more heavily in R&D activities than the national average; employ a higher percentage of engineers and scientists among their staff; offer technologically advanced products, typically with complex designs and configurations; and are dynamic in nature and have short product development cycles (Oakey *et al.*, 1988). Two steps were taken to classify the industries in which responding firms compete.

Step 1. Managers reported the primary SIC in which their company operated. This SIC was then compared with the lists developed by the National Science Foundation (2000), US Department of Commerce (Young and Steigerworld, 1990), and International Trade Administration (Davis, 1993). If the industry SIC code was included in these lists, it was classified as "high technology."

Step 2. Managers were asked to respond to six items that followed a 5-point response format (5 = very true vs 1 = very untrue; managers were also given the option to circle "not applicable"). The items appear in the Appendix. Using managers' responses to these items, the fast cluster procedure in SPSS classified sample firms into two groups. Group membership was then compared to the classification derived from the previous step. The two classifications overlapped 98 percent of the time, further validating the classification of industries into high and low technology. Dummy coding was used to capture industry effects in the analyses.

Control variables. The analyses also controlled for firm size and age, which could significantly influence the relationships examined in this study.

Firm Size. The analyses controlled for size because it could affect a firm's EO (Covin and Slevin, 1989; Durand and Courderoy, 2001), market orientation (Slater and Narver, 1995; Kohli and Jaworski, 1990; Laforet, 2008), and financial performance (Ahuja and Lampert, 2001). However, prior research has produced contradictory findings on the effect of firm size on each of these variables, suggesting a need for further analyses.

Firm Age. The analyzes also controlled for age because older firms were expected to be less entrepreneurial in their operations and more conservative in their market orientation. Older firms were more likely to compete in mature industries and might be slower in responding to change, which could lower their performance (Durand and Courderoy, 2001; Song *et al.*, 2008). Age was measured by the number of years that a firm has been in existence.

Analysis

To test the hypotheses, ordinary least squares regression estimates were used. In Step 1, the control measures and industry dummy variables were entered. In Step 2, the EO and market orientation variables were entered. In Step 3, the interaction estimate of EO and market orientation based on their multiplicative product was entered. The F-statistics,

significance, and variance explained by the adjusted R^2 are examined. To test the interaction effect of market orientation ($H1$), we ran the regressions using the full sample ($n = 457$). To test the differential effect of market orientation in both high and low technology industries ($H2$), we also ran regressions using sub-samples of firms in high technology ($n = 210$) and low technology industries ($n = 247$).

Results

Table I reports the descriptive statistics and zero-order correlations of the measures. The correlations do not suggest any serious multi-collinearity effects due to high correlations. In Table II, the regression results are reported. As anticipated, EO was not a statistically significant predictor in any of the models. Table II shows that the interaction between market orientation and EO to influence performance was supported ($H1$). In the combined-sample model, market orientation ($\beta = 0.31, p < 0.01$) and the EO*market orientation interaction term ($\beta = 0.37, p < 0.01$) were significant predictors of financial performance. The final regression model had an adjusted R^2 of 0.20 (Table II).

The hypothesis that the strength of the interaction effect would be stronger in high technology industries was also supported ($H2$). Analysis of the high technology industry sub-sample revealed that both market orientation ($\beta = 0.33, p < 0.01$) and the EO*market orientation interaction effect ($\beta = 0.34, p < 0.001$) were significant predictors of a firm's ROA. The interaction effect accounted for a statistically significant change in adjusted R^2 of 0.02. Both the direct effect of market orientation and the EO*market orientation interaction effect on performance were not statistically significant for the low technology industry sub-sample.

Discussion

A fundamental question facing entrepreneurship researchers is the study of the recognition and exploitation of new opportunities (Shane and Venkataraman, 2000) in the pursuit of wealth creation (Hitt *et al.*, 2001). This is an important issue for well-established companies seeking to retain their market positions by revitalizing their operations through entrepreneurship (Burgelman and Grove, 2007; Green *et al.*, 2008; Sathé, 2003). This study views market orientation as a systemic process through which firms recognize opportunities by identifying customer and market trends and needs (Day, 1999; Keh *et al.*, 2008; Slater and Narver, 1999). Though several sources of opportunities may exist (Alvarez and Barney, 2007; Zahra, 2008), the study of how firms identify and creatively respond to changes in their environment and the subsequent effect on financial performance is a central issue in entrepreneurship research.

Though it is possible to argue that being entrepreneurial involves being market oriented, results indicate that they are not the same. In fact, support for our hypotheses suggests that being market oriented strengthens the performance implications of being an entrepreneurial firm. It is likely that firms that are entrepreneurial (being proactive, innovative and risk takers) would benefit by developing strong market-driven capabilities in intelligence gathering and dissemination. This market orientation helps firms capitalize upon emergent opportunities, which enhances financial performance. The results support the hypothesis that market orientation and EO interact to influence subsequent financial performance relationship. The relationship between EO and

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Market orientation	3.28	1.07	1														
2 Entrepreneurship orientation	3.09	0.98	0.27	1													
3 Company age	31.14	14.73	-0.09	-0.09	1												
4 Company size	2.78	3.69	-0.11	-0.11	0.21	1											
5 ROA	8.38	13.07	0.19	0.13	-0.09	-0.08	1										
6 Electronic equipment	0.07	0.23	0.16	-0.05	-0.04	-0.14	0.28	1									
7 Drugs	0.09	0.13	0.14	0.12	-0.11	-0.08	0.07	-0.03	1								
8 Computer and office	0.14	0.14	0.04	0.15	-0.18	0.11	0.05	0.12	0.22	1							
9 Telecommunication	0.07	0.09	0.06	0.10	0.09	0.10	0.08	0.16	0.19	-0.16	1						
10 Measuring, medical	0.09	0.15	-0.04	0.09	0.04	0.09	0.18	0.04	0.15	0.11	0.11	1					
11 Food and kindred products	0.11	0.18	0.09	0.08	0.04	0.20	-0.12	-0.13	0.05	0.03	0.13	-0.04	1				
12 Paper and allied products	0.13	0.10	0.21	-0.19	0.03	0.17	-0.17	-0.17	-0.07	0.07	-0.04	-0.13	0.17	1			
13 Textile products	0.08	0.17	-0.08	0.09	-0.03	-0.03	0.14	-0.04	11	-0.09	-0.03	0.07	0.16	0.13	1		
14 Wood products	0.07	0.09	-0.09	0.08	0.19	0.09	0.21	-0.05	0.13	-0.20	0.02	0.08	-0.09	-0.09	-0.08	1	
15 Metal products	0.13	0.21	0.04	0.13	0.14	0.11	-0.03	-0.04	0.14	0.07	0.07	0.09	0.05	0.10	0.13	0.21	1

Note: Simple r has to be 0.13 or higher to be significant at $p < 0.05$

Table I.
Correlations and
descriptive statistics

Table II.
Regression results
(dependent variable: ROA)

Step	Variables	Combined sample $n = 457$			High technology-intensive industries $n = 210$			Low technology-intensive industries $n = 247$		
		1	2	3	1	2	3	1	2	3
1	Constant	0.88	0.21	1.67*	0.94	1.71*	2.07*	-0.47	-0.13	0.77
	Company age	-0.03	-0.02	-0.04	-0.11	-0.09	-0.08	-0.07	-0.06	-0.07
	Company size	0.05	0.08	0.13	-0.04	-0.05	-0.06	0.05	0.04	0.05
	<i>High tech industries</i>									
	Electronic equipment	0.19*	0.20*	0.25*	0.29*	0.27*	0.27*			
	Drugs	0.07	0.09	0.09	0.15	0.14	0.14			
	Computer and office equipment	0.03	0.05	0.06	0.09	0.11	0.10			
	Measuring and medical equipment	0.21*	0.23*	0.23*	0.19*	0.26*	0.24*			
	Telecommunications	0.01	0.04	0.04						
	<i>Low tech industries</i>									
2	Food and kindred products	-0.09	-0.06	-0.04				-0.13	-0.10	-0.07
	Paper and allied products	-0.06	-0.09	-0.07				-0.20*	-0.19*	-0.19*
	Textile	0.11	0.13	0.10				0.11	0.09	0.14
	Wood products	0.17*	0.19*	0.22*				0.23*	0.21*	0.20*
	Entrepreneurial orientation (EO)		0.05	0.09		0.05	0.08		0.09	0.09
3	Market orientation		0.29*	0.31**		0.26*	0.33**		0.08	0.13
	EO* Market orientation			0.37**			0.34**			0.11
	Adjusted R^2	0.12	0.19	0.20	0.11	0.18	0.20	0.07	0.11	0.12
	F-statistic	2.44**	3.91***	4.17***	2.37*	2.88**	3.14***	0.39	2.01*	1.65
	Change in R^2		0.07	0.01		0.07	0.02		0.04	0.01
F(Change in R^2)			19.13**	5.56***	8.54***	5.00**		5.41***		2.63*

Notes: * $p < 0.05$; ** $p < 0.01$ and *** $p < 0.001$

performance was not significant in the full sample and the sub-samples, indicating that this relationship is contingent upon other factors, consistent with previous studies (Covin and Slevin, 1989; Zahra and Covin, 1995). The results show that firms that have a high EO would benefit by having a high market orientation as well. Thus, a key contribution of this study is documenting the importance of market orientation as a key contingency variable in the study of the EO- financial performance relationship.

Market orientation was a significant predictor of performance in high technology industries but not for low technology industries (Table II). The market orientation-performance relationship finding is consistent with marketing studies that report this relationship (Slater and Narver, 2000). However, these results contradict claims that such a relationship is robust across industry settings (Jaworski and Kohli, 1993). It is likely that as industry change slows down the need for a strong market orientation decreases in more mature industries, suggesting an avenue for future research.

The results also indicate that the interaction effect between EO and market orientation was stronger in high technology industries but not statistically significant in firms operating in low technology industries. In low technology industries, both EO and market orientation were non-significant predictors of performance. However, in high technology industries, the interaction between EO and market orientation was a strong predictor of future financial performance, providing supporting for our hypothesis. This finding is consistent with the dynamic capabilities view that firms develop and deploy such capabilities when faced with a need to do so by their competitive environment (Eisenhardt and Martin, 2000; King and Tucci, 2002).

Several studies on corporate entrepreneurship have used the entrepreneurial orientation measure employed in this study. It will be interesting to examine the organizational capabilities of entrepreneurial firms to identify if certain organizational capabilities exist independent of their functional (production, marketing, etc.) or learning routines. For example, contemporary research introduces the “bricolage” concept of improvisation where firms make-do with a limited set of resources to attain entrepreneurial outcomes (Baker *et al.*, 2002). These authors suggest that firms improvise when faced with complex and uncertain situations where established routines do not exist. However, over time learning from improvisation would generate routines that may help firms remain entrepreneurial, if such routines change and evolve over time. These issues are captured to some extent when we consider disposition measures such as EO or market orientation. Future work, however, would benefit from conducting fine-grained analyses of how routines interact to produce or influence entrepreneurial outcomes, a topic of interest to entrepreneurship scholars in particular and organizational scholars in general. How and where the routines needed to stimulate entrepreneurship are developed in a company is also an issue of interest. It would be useful for researchers also to determine how managers deploy these routines to develop the capabilities essential to recognizing and exploiting opportunities.

Conclusion

The study’s findings add to our knowledge of entrepreneurial firms and the context within which they operate. The processes that underlie a firm’s market orientation (e.g., intelligence generation and information dissemination) are important routines that generate dynamic capabilities, which will likely to benefit firms operating in high

technology industries to achieve superior performance. Consequently, the implications for high technology firms' executives are clear. These processes allow entrepreneurial firms to identify emerging market trends and recognize opportunities in their industries, thus enabling them to respond with new products that enhance their growth prospects and financial performance. Managers in high technology industries would benefit from developing capabilities and implementing systems that augment their firms' market orientation. Market orientation provides an important means to harness the firm's EO, an important means of achieving growth and profitability. The results encourage future research on the nexus of opportunity recognition and entrepreneurial behavior in established firms embedded in organizational routines.

Note

1. Emphasis here is on the overlap rather than convergence of these theoretical streams when we suggest that the dynamic capabilities view and entrepreneurship have certain aspects in common. Clearly, each stream has more domain content than is discussed herein.

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Appendix. Items used to classify high and low technology industries

As stated in the paper, two ways were used to classify industries into low vs high technology. The first relied on authoritative lists developed by the National Science Foundation and the US Department of Commerce. The second approach used six-survey items, relying on managers' responses as inputs into a cluster analysis. For each item, managers selected the number that best described their company's situation. Items and response format used are shown in Table AI.

<i>This company competes in an industry that:</i>	1	2	3	4	5	NA
Invests heavily in R&D.	1	2	3	4	5	NA
Employs a high percentage of engineers and scientists	1	2	3	4	5	NA
Offers technologically advanced products	1	2	3	4	5	NA
Offers products with complex designs and configurations	1	2	3	4	5	NA
Is characterized by short product life cycles	1	2	3	4	5	NA
Is in the growth stage of its life cycle	1	2	3	4	5	NA

Table AI.

Notes: 1 – very untrue; 2 – untrue; 3 – neutral; 4 – true; 5 – very true; NA – not applicable

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