

## DEVELOPING ENTREPRENEURIAL ORIENTATION - THE ROLE OF DYNAMIC CAPABILITIES AND INTANGIBLE RESOURCES

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### Abstract

This paper adds to the debate on entrepreneurial orientation and dynamic capabilities. We build upon the resource-based view analyzing firm resources crucial for taking the firm towards new competitive business platforms. We imply that the assets of tangible and intangible resources work together with dynamic capabilities to stimulate entrepreneurial strategies within the firm. Particularly we focus upon the role of intangible resources and dynamic capabilities in developing entrepreneurial orientation. Specifically, we suggest that dynamic capabilities mediate the relationship between intangible resources and entrepreneurial orientation. Data from a sample of 651 Norwegian firms engaged in R&D activities was utilized to empirically test the hypotheses. The findings indicate that dynamic capabilities related to opportunity search and readjustment ability are related to entrepreneurial orientation. Further, these dynamic capabilities mediate the relationship between relation-based resources and entrepreneurial orientation, while knowledge-based resources were found to be directly associated with entrepreneurial orientation.

**Keywords:** Entrepreneurial orientation, dynamic capabilities, intangible resources, Norway

## INTRODUCTION

It is widely accepted that firms need to continuously change their business platforms to remain competitive in today's dynamic environments. Even though sustainable competitive advantage is sought for, the best most firms can hope for is creating a series of temporary competitive advantages (Hitt *et al.*, 2002). Thus, the firm has to be continuously alert and in a process of creating the new business platform replacing the present one. The ability of established firms to create new resources and transform its present resources into new valuable competitive strategies is considered critical for initiation and implementation of innovative processes (Burgelman, 1984; Venkataraman *et al.*, 1992; Dess *et al.*, 1999). Further, the firm's ability to frequently explore and exploit new business opportunities is vital in order to stay ahead of their rivals (Zahra, *et al.*, 2006). As a consequence, managers are looking for ways to make their organizations more entrepreneurial and to continuously adopt innovative strategies (Brown, *et al.*, 2001).

In this paper we propose that a source of competitive advantage is resources and capabilities increasing the entrepreneurial orientation of the firm. Entrepreneurial orientation (EO) is the firm's strategic orientation reflecting the willingness to engage in entrepreneurial behaviour (Brown and Kirchoff, 1997; Wiklund, 1998). The firm's propensity to take risks, innovate and act proactively is the crucial dimensions of EO (Miller, 1983). The EO concept relates to the entrepreneurial aspects of

firm behaviour, often identified as discovery, creation and exploitation of new business opportunities (Shane and Venkataraman, 2000).

The resource-based view of the firm (RBV) suggests that specific resources controlled by the firm that may create competitive advantage. Organizations consist of heterogeneous bundles of resources. By combining such bundles in specific ways, a firm can create unique capabilities and develop a competitive advantage. This can be achieved if the firm controls unique resources and capabilities, and is capable of building new valuable strategies on these resources and capabilities (Chandler and Hanks, 1994). Firms may thus gain competitive advantage through creativity in achieving resources from a broad set of external sources and in resource combinations supporting their competitive positioning in the market (Borch, *et al.*, 1999). In particular, RBV has emphasized the role of intangible resources. Intangible resources can play an essential role in the firm's ability to be dynamic and entrepreneurial.

However, having the resources available is not enough. A critical capability is to explore new opportunities and to bundle old and new resources into new and unique resource configurations providing a new business platform. The dynamic capability literature has emphasized specific capabilities enabling firms to continuously pursue new opportunities. Dynamic capabilities (DC) are the abilities to reconfigure a firm's resources and routines to achieve to exploit new opportunities (Zahra *et al.*, 2006). We are here talking about action patterns to achieve new forms of competitive advantage through building, integrating and reconfiguring internal and external competencies (Teece, *et al.*, 1997). By renewing competences the firm can keep up with changing environments and create new value generating strategies (Eisenhart and Martin, 2000).

We still have limited knowledge as to why some firms are able to continuously explore and exploit entrepreneurial opportunities (Zahra *et al.*, 2006). The purpose of this study is to empirically contribute to this field by exploring the relationships between intangible resources, dynamic capabilities and entrepreneurial orientation. Starting from the resource based view of the firm we argue that intangible resources contribute to the development of both dynamic capabilities and entrepreneurial orientation. Further, we argue that DC constitutes unique capabilities important for the development of entrepreneurial orientation. Moreover, we suggest that some types of dynamic capabilities may mediate the relationship between intangible resources and entrepreneurial orientation.

## THEORETICAL INSIGHTS

### Entrepreneurial Orientation

The strategic orientation and agility of the managers and employees are important for firm survival and growth. Research within corporate entrepreneurship emphasizes that firms can develop internal environments that stimulates creativity and ability to introduce and harvest innovations (Zahra, 2005). Entrepreneurship within existing organizations is about introducing products, processes or organizational patterns in new combinations ahead of competitors, and in taking risks towards spending resources and in launching new strategies in the market. Miller (1983) suggested that a firm's degree of entrepreneurship could be seen as the extent to which they take risks, innovate and act proactively. Knight (1997) showed that these dimensions form a single, multidimensional measure. We build upon this understanding and regard entrepreneurial orientation as the combination of these three dimensions (Covin, 1991; Covin and Slevin 1989; Wiklund, 1999). *Innovativeness* reflects a tendency to support new ideas, novelty, experimentation, and creative processes, thereby departing from established practices and technologies (Lumpkin and Dess, 1996). *Proactiveness* refers to a posture of anticipating and acting on future wants and needs in the marketplace, thereby creating a first-mover advantage *vis-à-vis* competitors (Lumpkin and Dess, 1996). With such a forward-looking perspective, proactive firms capitalise on emerging opportunities (Wiklund and Shepherd, 2003a). *Risk-taking* is associated with a willingness to commit large amounts of resources to projects where the cost of failure may be high (Miller and Friesen, 1978). It also implies committing resources to projects where the outcomes are unknown. Therefore, the firm's risk taking propensity largely reflects the organization's willingness to break away from the tried-and-true and venture into the unknown (Wiklund and Shepherd, 2003a).

Husted and Vintergaard (2004) emphasize that firms have to nurture and sustain their corporate entrepreneurial orientation through participating actively in developing and shaping a steady flow of innovative ideas. Several studies have revealed that entrepreneurial orientation can foster growth (Wiklund, 1999; Zahra and Covin, 1995), new knowledge creation (Zahra *et al.* 1999; Dess *et al.*, 2003) and interact positively with strategic management practices (Barringer and Bluedorn, 1999). The corporate entrepreneurship literature, however, lacks knowledge on the interaction between different antecedent conditions and different entrepreneurial dimensions. Much of the corporate

entrepreneurship literature has been oriented towards structural and environmental elements without focusing on dynamic features and development of entrepreneurial orientation.

### **Entrepreneurial Orientation and Firm Resources**

According to the resource based view, the entrepreneurial process towards firm renewal is dependent upon the acquisition and reconfiguration of resources serving as a platform for new innovations (Grant, 1991). This means that valuable resources controlled by a company which are difficult to copy (i.e. valuable, rare, not imitable, and difficult to substitute) is the driving force towards new competitive platforms (Barney 1991). To achieve competitive advantage, the composition of resources into capabilities that gives superior talents in carrying out innovative tasks and activities. Barney (2002) claims that capabilities are internal company properties putting the company in the position to coordinate and exploit the rest of their resources. Both these definitions are in line with Penrose's (1959) notion that the ability to use resources is a crucial element. In this context Grant (1991, p.113) argues that: "*While resources are the source of a firm's capabilities, capabilities are the main source of its competitive advantage*". Implicit here is the notion that resources alone are not sufficient to generate such advantages. The firm must transform resources into capabilities that may generate certain dividends in order to gain competitive advantages (Chandler and Hanks 1994). To create new competitive platforms is not just a matter of collecting a bunch of resources.

While a number of different types of firm resources may be expected to impact on the entrepreneurial orientation of a firm, intangible resources related to knowledge has been considered to be particularly important (Grant, 1991). Knowledge-based resources are the knowledge possessed by the firm which it can utilize to enhance an entrepreneurial orientation within the firm. Relation based resources are network contacts and relations of the firms to others through which the firm can gain knowledge if and when needed.

*Knowledge-based resources* may be particularly important for providing sustainable competitive advantage, because they are inherently difficult to imitate, thus facilitating sustainable differentiation (McEvily and Chakravarthy, 2002), and thereby play an essential role in the firm's ability to be entrepreneurial (Galunic and Eisenhardt, 1994). Knowledge permits the firm to predict more accurately the nature and commercial potential of changes in the environment and the appropriateness of strategic and tactical actions (Cohen and Levinthal, 1990). Without such knowledge, an organization is less capable of discovering and exploiting new opportunities (Wiklund and Shepherd, 2003b).

*Relation-based resources* allow the firm access to information, resources, markets and sometimes also technologies (Gulati *et al.* 2000). In this study we will focus at the firm's general networks, the firms' R&D networks and the firm's board cooperation as relation based resources, which can be characterised as intangible and inimitable and therefore valuable to the firm. Development of linkages with the external environment is a mechanism by which scarce resources may be accessed. Creating and maintaining these linkages may be an organizational capability that creates competitive advantages for the firm (George *et al.* 2001), as well as increases skills in all parts of the organization. This creates an intangible contribution to strategy which is not easily located (Teece *et al.* 1997). Networks incorporating functional relations and social and emotional ties are considered to be of special importance in understanding small business development (Larsson 1991; Johannisson *et al.* 1994). The relation based resources may act as a buffer against shocks or surprises from the market.

So far, EO scholars have mainly focused on how the firm is organised to undertake entrepreneurial endeavours, and have largely ignored resources internal to the firm. For example, as determinants of EO the literature has examined a vast array of factors ranging from the external environment in which the firm operates to organizational variables (Covin and Slevin 1989, 1991; Zahra 1991; Zahra and Covin 1995; Wiklund 1998). The resource-based view suggests that resources which are socially complex, for instance organizational networks and formal administrative governance systems are most likely to 'generate rents' when they are 'bundled' with other resources in a complementary fashion (Barney 1992; Teece *et al.* 1997). Moreover, because of causal ambiguity, path dependencies, and social complexity, competitors should find it harder to duplicate an advantage when it results from a bundle of valuable, firm-specific resources (Teece *et al.* 1997). Due to their imperfect mobility, these resources may be critical to achieve sustainable competitive advantage, for instance will a firms' relation with a research institute be difficult to instantly change due to complex relations which also involves knowledge. Mobility may be reduced through linking internal resources with external networks, and creating network systems at a higher complexity level (Black and Boal 1994).

A firm's resources will influence managerial perceptions and thus the direction for growth (Wernerfelt, 1984). Empirical research supports the proposition that the firm's level of EO vary depending on resources internal to the firm (Wiklund 1999; Brush *et al.* 2001; Wiklund and Shepherd, 2005). This suggests the following hypotheses:

*H1a: There is a positive relationship between the firm's knowledge-based resources and EO.*

*H1b: There is a positive relationship between the firm's relation-based resources and EO.*

### **Resources and Dynamic Capabilities**

Some types of capabilities may be of special importance to the firm. In volatile settings the firm has to be prepared for continuously change in strategic adaptation. Capabilities that help the firm revise their routines, mindset and action patterns are of particular importance to firms facing turbulent environments (March, 1991). These creative and dynamic processes within the firm help the managers to stay alert and to be creative and influence the firm's possibilities for strategic reorientation (Grant, 1991). The entrepreneurial firm is in need of capabilities that help the firm change the way the firm solves its problems (Zahra *et al.*, 2006). We may call these capabilities the dynamic capabilities of the firm. The availability of such capabilities may explain why some firms discover and exploit opportunities ahead of their competitors, thus achieving competitive advantage (Eisenhardt and Martin, 2000; Teece, *et al.*, 1997).

The DC literature is concerned with how firms prepare for the exploitation of new opportunities in future markets. While important conceptual advancements have been made concerning the role of dynamic capabilities, empirical work in the area is scarce. The emergent literature on dynamic capabilities and their role in value creation is also unclear. So far research has not provided a compelling explanation for the ability of some new and established companies to continuously create, define, discover and exploit entrepreneurial opportunities (Zahra *et al.*, 2006). Building on Eisenhardt and Martin (2000) and Teece *et al.* (1997), Borch and Madsen (2005) identified four distinctive but closely related dynamic oriented capabilities: internal and external resource reconfigurations; learning; and strategic decision-making. In this study we put the focus on internal resource reconfiguration capabilities as well as learning capabilities. For most small and medium sized firms the lack of financial resources makes it necessary to re-circulate as much as possible of the present resources, with fewer degrees of freedom as to acquire radical new resources. Hence, they have to map the broad set of resources and competencies both present and emerging within the firm to become entrepreneurial (Greene, *et al.*, 1999). This puts an extra strain on the internal resource configuration and learning capabilities of the firms.

*Capabilities to integrate internal resources* are important in processes where resources are reconfigured according to the new visions (Eisenhardt and Brown, 1999). The present position of a firm, its repertoire of routines and physical resources may create a history that constrains future strategic action (Teece *et al.*, 1997). As such this process sets the framework for the whole strategic change activity of the firm. Among other things, this process decides upon the paths of change within the firm, not least the bindings to earlier solutions and action patterns, the degree of experimentation and the range of external search and integration. It may keep the firm manager and his employees alert as to the hidden potential of existing resources and ready for new bundling of resources to face changes in environment.

*Learning mechanisms* is an important dynamic feature of the firm (Eisenhardt and Martin, 2000). Innovativeness demands broad channels of information exchange, and cross-functional teams that may bring together different sources of ideas and expertise. The learning process includes routines that provide exchange of joint experiences among team and functions, as well as extensive communication links out of the firm to increase the amount of new impulses. To achieve radical learning at low costs the firm may rely on an extensive learning environment for the employees. This also may provide superior knowledge about the market and not the least competitors reducing the perceived risk of new strategic action. It may also create knowledge as to the perfect timing for launching new strategies.

One may expect a close relationship between resources and DC. The resource base of the firm is expected to create the foundation for the development of DCs (Teece *et al.*, 1997) because it influences future resource positions (Eisenhardt and Martin, 2000), capabilities (Kogut and Zander, 1992), and operational routines (Nelson and Winter, 1982). However, there is a scarcity of studies looking into which types of resources might be of importance for developing DC. The few studies conducted have found that employee human capital, education of the founder, access to expertise and access to technological resource (McKelvie and Davidsson, 2006), exploratory learning and leadership skills (education) (Madsen, *et al.*, 2006), knowledge-based resources and IT (Sher and Lee, 2004) and internet readiness (Kickul and Liao, 2004), have influence on some dynamic capabilities but not on others. One problem with these studies is that they are utilizing a diversity of dynamic capability measures with little in common. This makes it difficult to have a clear opinion of which resources contributes to dynamic capabilities. Nevertheless, we argue that knowledge-based as well as relation

based resources are important to the development of dynamic capabilities. This leads us to suggest the following hypotheses:

*H2a: There is a positive relationship between a firm's knowledge-based resources and dynamic capabilities.*

*H2b: There is a positive relationship between a firm's relation-based resources, and dynamic capabilities.*

### **Dynamic Capabilities and Entrepreneurial Orientation**

The DCs help the firm to continuously renew itself and explore and exploit new competitive business platforms. Thus, it may contribute to the entrepreneurial orientation of the firm through stimulating innovativeness and keep the managers and employees agile towards new challenges and opportunities. Resources, and the way they are being combined, must be combined in complex bundles or resource networks if the advantage is to be sustainable (Barney, 1991; Black and Boal, 1994; Capron, *et al.*, 1998). This may be a time consuming process meaning that the dynamic firm has to start process of resource reconfiguration early on. The dynamic recombination of resources, as reflected in a firm's DCs, may be of greater interest to firm performance than the resource position per se. This can be based on the implicit assumption that first-mover firms allocating resources on innovative activities often are rewarded in the marketplace. Hence, the shortening of product and business model life cycles makes future profit streams from existing operations uncertain, and businesses need to constantly seek out new opportunities (Hamel, 2000). These entrepreneurial firms tend to monitor market changes, respond quickly, and capitalize on emerging opportunities. We suggest that the dynamic capabilities of a firm may foster such entrepreneurial behaviour through their contribution to develop an entrepreneurially oriented strategy of the firm.

Accordingly, the following hypothesis is suggested:

*H3: There is a positive relationship between the firm's dynamic capabilities and EO.*

### **Resources, Dynamic Capabilities and Entrepreneurial Orientation**

Within the DC literature it is argued that in addition to the resources themselves, the organizational and strategic processes of firms are important because they facilitate the manipulation of resources into value-creating strategies (Amit and Schoemaker, 1993; Eisenhardt and Martin, 2000). Empirical studies have mainly focused on the direct link between individual or configurations of resources and an EO (Wiklund, 1998), or direct or configurational links between these factors and performance (Miller, 1983; Wiklund, 1999; Wiklund and Shepherd, 2003b, 2005). Little attention has been made to examine the interrelationship between resources, dynamic capabilities and EO. Therefore, the range of organizational capabilities needed to pursue new challenges and opportunities are still not well understood.

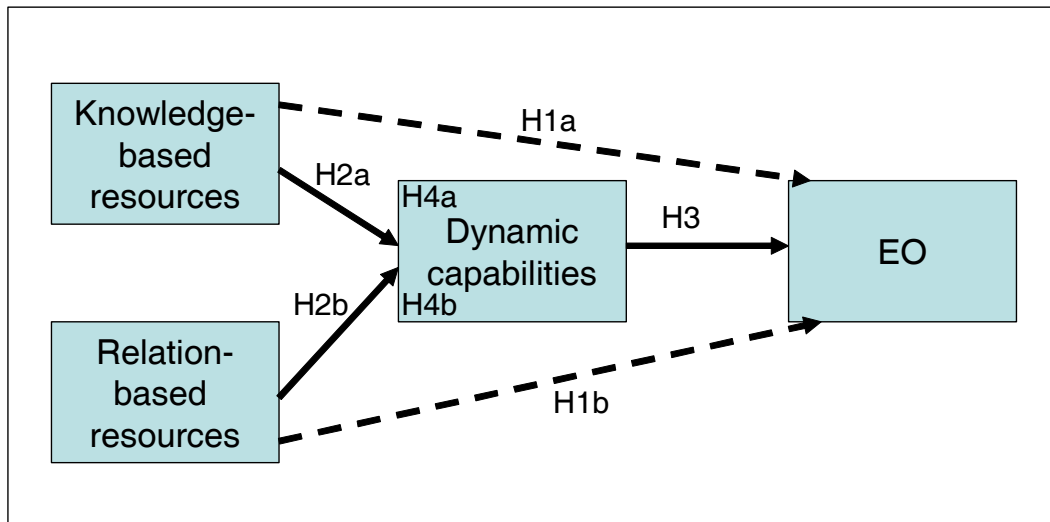
The dynamic capabilities of the firm are of a special immaterial substance related to internal routines and working behaviour. It may be expected that this type of capabilities may be expected to be difficult to achieve, and cannot simply be bought but has to be developed gradually (Teece, *et al.* 1997). Instead they have to be developed over time through bundling of different types of resources within the firm. Some types of resources may be of particular importance. The competence of the manager and employees and their experience in particular may be of special importance. Also, there is a need for a broader network to create new resource integrating routines. Thus, we may expect that the DCs may influence on the way firm resources interact with EO.

We suggest the following hypotheses:

*H4a: DC mediates the relationship between the firm's knowledge-based resources and EO.*

*H4a: DC mediates the relationship between the firm's relation-based resources and EO.*

The hypotheses are summarized in the research model illustrated in figure 1.

**Figure 1: Research Model**

## METHOD

Data for this study was gathered from small and medium sized enterprises identified as conducting R&D activities in Norway. The population was all businesses registered to a scheme for tax deduction of R&D costs. As all enterprises which are eligible for taxation could register their R&D activities to receive a tax refund, the registered enterprises include close to all enterprises which are involved in such activities. All enterprises which registered R&D activities during May to December 2005 were approached, in all 1478 enterprises. Those who registered more than one R&D activity during this period were approached only once.

A web-based questionnaire was developed to measure resources, entrepreneurial orientation, R&D intensity and dynamic capabilities of these firms. A link to the questionnaire was e-mailed to the enterprises within a month after they registered R&D activities. The initial mailing was followed by two e-mail reminders. Of the enterprises approached, 1043 (71%) returned filled-in questionnaires. Cases with incomplete responses for the variables used in this study were removed, leaving 561 cases for the analysis. This constitutes 38% of the sampling frame. Secondary data regarding each of the firms receiving tax refund were used to conduct response bias tests as well as data regarding control variables. These data included firm size, industry and geographical location. Response bias test were conducted related to enterprise employment size, industry and geography. No serious response bias was detected.

### Measures

*Entrepreneurial orientation (EO)*: A measurement scale was developed based on Covin and Slevin's (1989) operationalization of entrepreneurial orientation. The items were adapted to a one-sided, seven-point Likert scale where 1 = strongly disagree and 7 = strongly agree. The measurement scale included three items related to each of the two dimensions; innovation and risk taking, and two items related to the third dimension; proactiveness. In accordance with previous studies, we have used this scale as one summed index (e.g. Brown *et al.*, 2001). The eight items where averages. Cronbach's alpha of the EO scale was 0.78.

*Dynamic capabilities* were measured using fourteen items. The items were measured using a one-sided seven point Likert scale where: 1 = strongly disagree and 7 = strongly agree. A principal component analysis revealed four underlying factors identified as separate types of dynamic capabilities; Opportunity search and integration capabilities, Learning capabilities, Resource allocation capabilities and Reorganization capabilities. Component scores were used to represent the four variables.

*Intangible resources* were measured using 22 items related to knowledge-based and relation-based resources. The items were measured using a one-sided seven point Likert scale where: 1 = strongly

disagree and 7 = strongly agree. A principal component analysis revealed six underlying factors identified as separate types of resources. These included three types of knowledge-based resources; technology competence, market competence and R&D activity competence, as well as three types of relation-based resources; network, active board and R&D cooperation. Component scores were used to represent the four variables.

## RESULTS

Prior to the formal testing of the hypotheses, descriptive statistics and correlations were run. The results are shown in table 1. There are significant correlations between four of sex resource variables and EO, all four DC variables and EO as well as between resource variables and DC variables. This indicates preliminary support to our hypotheses. Moreover, table 1 shows that multicollinearity is not a problem.

**Table 1: Descriptive statistics: Mean, standard deviation, correlations and VIF-values**

|   | Mean | Std. dev. | 1      | 2      | 3      | 4      | 5      | 6    | 7    | 8    | 9    | 10   | VIF   |
|---|------|-----------|--------|--------|--------|--------|--------|------|------|------|------|------|-------|
| EO  | 4.75 | .95       |        |        |        |        |        |      |      |      |      |      |       |
| DC:<br>Opportunity search                 | 1.00 | 0.00      | .465** |        |        |        |        |      |      |      |      |      | 1.686 |
| DC: Learning                              | 1.00 | 0.00      | .190** | .000   |        |        |        |      |      |      |      |      | 1.624 |
| DC:<br>Reallocation                       | 1.00 | 0.00      | .104*  | .000   | .000   |        |        |      |      |      |      |      | 1.246 |
| DC:<br>Readjustment                       | 1.00 | 0.00      | .378** | .000   | .000   | .000   |        |      |      |      |      |      | 1.392 |
| Technology competence (X <sup>2</sup> )   | 1.00 | 0.00      | .416** | .120** | .121** | .030   | .369** |      |      |      |      |      | 1.332 |
| Market competence                         | 1.00 | 0.00      | .069   | .052   | .148** | .303** | .113** | .000 |      |      |      |      | 1.248 |
| R&D activity competence (X <sup>2</sup> ) | 1.00 | 0.00      | .352** | .273** | .368** | .132** | .067   | .000 | .000 |      |      |      | 1.593 |
| Network                                   | 1.00 | 0.00      | .200** | .240** | .191** | .023   | .216** | .000 | .000 | .000 |      |      | 1.360 |
| Active Board                              | 1.00 | 0.00      | .082   | .115** | .088*  | .128** | .016   | .000 | .000 | .000 | .000 |      | 1.089 |
| R&D cooperation                           | 1.00 | 0.00      | .199** | .302** | .159** | .082   | .106*  | .000 | .000 | .000 | .000 | .000 | 1.346 |

N= 561. Statistic significance: \*\* indicates  $p < .01$ .

Hypotheses were tested using linear regression models. First, to test for the relationship between intangible resources and dynamic capabilities, a regression model for each of the four types of DC were run. The results are shown in table 2. All models are significant with an adjusted R<sup>2</sup> between .124 and .246. The findings reveal significant positive relationships between some categories of knowledge-based resources and some categories of relation-based resources and all the four DC types. When it comes to knowledge-based resources, technology competence showed a significant positive influence on DC Opportunity search, DC Learning and DC Readjustment skills. Market competence was significant in the models for DC Learning, DC Reallocation and DC Readjustment skills. Finally, R&D Activity showed significant impact for DC Opportunity search, DC Learning and DC Reallocation. This indicates a positive relationship between knowledge-based resources and dynamic capabilities. Hence, hypothesis H2a is supported.

When it comes to relation based resources, general networks showed a significant positive influence on DC Opportunity search, DC Learning and DC Readjustment skills. An active board was significant in the models for DC Learning, DC Reallocation and DC Readjustment skills. Finally, R&D networks were statistically significant with a positive impact in all four DC models. Thus, a positive relationship between relation-based resources and dynamic capabilities seems to exist. Hence, hypothesis H2b is supported.

**Table 2: Linear Regression: Resources and dynamic capabilities**

|                           | DC1<br>Opportunity<br>search | DC2<br>Learning | DC3<br>Reallocation | DC4<br>Readjustment<br>skills |
|---------------------------|------------------------------|-----------------|---------------------|-------------------------------|
| Knowledge based resources |                              |                 |                     |                               |
| Technology competence     | .120**                       | .121**          | .030                | .369**                        |
| Market competence         | .052                         | .148**          | .303**              | .113**                        |
| R&D activity              | .273**                       | .368**          | .132**              | .067                          |
| Relation based resources  |                              |                 |                     |                               |
| Network                   | .240**                       | .191**          | .023                | .216**                        |
| Active board              | .115**                       | .088*           | .128**              | .016                          |
| R&D Cooperation           | .302**                       | .159**          | .082*               | .106**                        |
| Model characteristics     |                              |                 |                     |                               |
| F-value                   | 31.15*                       | 29.09*          | 14.33*              | 24.55*                        |
|                           | *                            | *               | *                   | *                             |
| R <sup>2</sup>            | .254                         | .241            | .134                | .212                          |
| Adjusted R <sup>2</sup>   | .246                         | .233            | .124                | .203                          |

N=561. Statistic significance: \* indicates p<.05 and \*\* indicates p<.01.

Second, a hierarchical linear regression analysis was run to test for relationships with entrepreneurial orientation as dependent variable. The results are shown in table 3. First, independent variables related to knowledge-based as well as relation-based resources were included in the model (Model 1: Resource model). The results showed statistical significant influences from all the three types of knowledge-based resources on EO; technology competence, market competence and R&D activity. However, market competence gave the lowest Beta-value and was only significant at the 5-percent level. Nevertheless, these results indicate a positive relationship between knowledge-based resources and EO. Hence, hypothesis H1a is supported.

**Table 3: Hierarchical Linear Regression: EO as dependent variable**

|                           | Model 1 | Model 2 |
|---------------------------|---------|---------|
| Knowledge based resources |         |         |
| Technology competence     | .416**  | .288**  |
| Market competence         | .069*   | .009    |
| R&D activity              | .352**  | .233**  |
| Relation based resources  |         |         |
| Network                   | .200**  | .068    |
| Active board              | .082*   | .033    |
| R&D Cooperation           | .199**  | .069    |
| Dynamic capabilities      |         |         |
| DC1 Opportunity search    |         | .321**  |
| DC2 Learning              |         | .027    |
| DC3 Reallocation          |         | .045    |
| DC4 Readjustment skills   |         | .229**  |
| Model characteristics     |         |         |
| F-value                   | 58.06** | 49.77** |
| R <sup>2</sup>            | .388    | .477    |
| Adjusted R <sup>2</sup>   | .382    | .468    |
| Δ R <sup>2</sup>          |         | .089    |
| Δ F-value                 |         | 23.23** |

N=561. Statistic significance: \* indicates p<.05 and \*\* indicates p<.01.

Further, all the three relation-based resources were also significant in the model; general networks, active board and R&D networks. Here, an active board showed the weakest impact and were only significant at the 5-percent level. All the same, these results indicate a positive relationship between relation-based resources and EO, giving support for hypothesis H1b. In model 2, the DC model, the four types of dynamic capabilities are included. The results show a positive significant impact from DC1 Opportunity search as well as from DC4 Readjustment skills. DC2 Learning and DC 3 Reallocation gave no significant influence in the model. Hence, hypothesis 3 which indicate a positive

relationship between DC and EO is only partially supported. Further, the all three types of relation-based resources lost their significant impact in the model when the DC types were included. This is also true for one of the knowledge-based resources; market competence. The impact of technology competence and R&D activity did also become weaker, but these two resources are still highly significant in the model. This indicates that there is a direct effect between these two types of knowledge-based resources and EO, and that the indirect effect through the development of DCs is weaker. For the relations-based resources it is the other way around. The findings indicate that the relationship between these resources and EO is indirect through the development of DC. Hence, hypothesis H4a is not supported from these findings, while hypothesis H4b gains support.

## DISCUSSION AND CONCLUSION

The present study is one of the first attempts to explore the relationship between dynamic capabilities and entrepreneurial orientation. The EO concept has often been adopted by entrepreneurship scholars studying firm level entrepreneurship (e.g. Brown *et al.*, 2001; Covin and Slevin, 1991; Wiklund, 1999). The DC concept, on the other hand, have often been used by strategic management scholars wanting to explore their dynamic processes of sustaining competitive advantage (e.g. Eisenhardt and Martin, 2000; Teece *et al.*, 1997; Zahra, *et al.*, 2006). However, both concepts relate to the entrepreneurial processes of a firm related the identification and exploitation of business opportunities in order to create competitive advantage. Moreover, both concepts are assumed to be pursued by the firm's intangible resources.

The results from this study show that while EO and DC are clearly different concepts, they are also related. We suggested that the firm's dynamic capabilities are antecedents to EO. The empirical results indicated that only specific types of DC are related to the development of entrepreneurial orientation. The capabilities related to continuously searching internally and externally for new business opportunities, named DC Opportunity search, seem to enhance entrepreneurial orientation. Firms which possess such capabilities seem to be more likely to adopt an entrepreneurial oriented strategy related to innovation, risk taking and proactiveness.

According to the entrepreneurship literature, the search for opportunities is central to the entrepreneurial process (Shane and Venkataraman, 2000; Ucbasaran, *et al.*, 2001). While there has been argued that only individuals can identify new opportunities through a cognitive process (Kirzner, 1973; Shane, 2003), organizations can certainly build internal environments that promote opportunity recognition and creation within the firm. Developing opportunity oriented capabilities in the organization may be an important step towards increasing the entrepreneurial orientation of the firm.

Moreover, this study indicated that capabilities related to the willingness and ability of the organization to continuously change, named DC adjustment skills, promote entrepreneurial orientation. These types of skills may prove necessary for an organization to be able to adopt a strategy related to innovative, risky and proactive actions. This confirms the suggestions by Husted and Vintergaard (2004) that the management has to nurture a continuous stream of new ideas throughout the firm to keep the employees prepared for new ventures. An organic organization creates an acceptance for new ideas and alertness to environmental change (Covin and Slevin, 1989).

This study has also highlighted the role of intangible resources in the development of dynamic capabilities and entrepreneurial orientation. We have distinguished between knowledge-based resources reflecting the competences possessed by the firm, and relation-based resources reflecting the contacts and links the firm has to others. Such relations can be utilized to acquire new knowledge to the firm when needed. The findings suggest that both types of intangible resources are relevant to the development of dynamic capabilities as well as to the entrepreneurial orientation. However, while knowledge-based resources show a strong direct relationship to both DC and EO, relation-based resources seems to promote EO indirectly through their contribution to developing dynamic capabilities. The reason for this may be that relation-based resources are more dynamic promoting in nature than the knowledge possessed by the firm. This can be related to Reuber and Fisher's (1999) distinction between the perspective of knowledge as a stock (i.e. knowledge possessed by a firm/individual) and the perspective of knowledge as a stream (i.e. the process of gaining knowledge). In the first case knowledge can be seen as a characteristic of the organization, while in the second case, knowledge is seen as processes of the organization. Relation-based resources can be viewed to support such knowledge processes, since they may give access to information. However, to make this happen, the organization has to be capable of adopting and integrating the information gained through network contacts. Only then it can be turned into organizational knowledge applicable to entrepreneurial

oriented strategies. Hence, the relation-based resources contribute to the firm's EO through their supply of information to the organization. This stream of information promotes the development of dynamic capabilities related to opportunity search and readjustment skills of the organization, which again promotes EO.

This exploratory study has entered into the complex relationships between intangible resources, dynamic capabilities and entrepreneurial orientation of innovative firms. While this has given valuable insights, one should also be aware of the studies limitations. First, this is a cross-sectional study which means that the directions of the relationships cannot be finally determined. There is a need for longitudinal studies exploring the direction of the relationships more in detail. Second, these relationships may vary depending on characteristics of the firms or their environments. Such variations have not been controlled for in this analysis. Future studies should bring in contextual factors related to types of firms (industry, size, etc.) as well as to the external environments of the firm (dynamism, munificence, hostility) to the analysis of DC and EO. Third, we have covered only a limited number of dynamic capabilities. For instance, capabilities related to external resource reconfiguration and strategic decision-making (Borch, *et al.*, 2006) are not explored here. Fourth, this study has been conducted within a single country setting. It should be validated to other settings in future studies.

Despite these limitations, this study has several implications for future research within the entrepreneurship as well as the strategy domain. First, researchers wanting to explore EO or DC of the firm should take into account that these two concepts are interlinked. We also still know too little on the distinction between dynamic capabilities and resources (Winter, 2003). Further, studies investigating the relationship between firm resources and EO, should take into account that these relationships may not only link resources directly to the firm's level of EO. Rather, certain types of DC may mediate this relationship, indicating that resources need to be transformed through the dynamic processes of the firm to be able to contribute to an entrepreneurial strategy. This study has been on organizational level emphasizing the role of the managing director of the firm. Future research should go deeper into the interplay between the manager and the employees of the SME. Also, we need more knowledge about the individual resources of the actors involved in the process of creating new business platforms. To reveal these relations, more in-depth qualitative research is needed.

## REFERENCES

- Amit, R., Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14(1), 3-46.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Barney, J. B. (1992). Integrating organizational behaviour and strategy formulation research: A research based analysis. In P. Shrivastava, A., Huff J., Dutton (Eds.), *Advances in Strategic Management* (Vol. 8, pp. 39-62). Greenwich, CT: JAI Press.
- Barney, J. B. (2002). *Gaining and sustaining competitive advantage*. (Second edition ed.). Upper Saddle River, NJ: Prentice Hall.
- Barringer, B.R., Bluedorn, A.C (1999). The relationship between corporate entrepreneurship and strategic management, *Strategic Management Journal*, 20 (5), 421-444.
- Black, J. A., Boal, K. B. (1994). Strategic resources: Traits, configuration and paths to sustainable competitive advantage. *Strategic Management Journal*, 15(Summer), 131-148.
- Borch, O. J., Huse, M., Senneseth, K. (1999). Resource configuration, competitive strategies and corporate entrepreneurship: An empirical examination of small firms. *Entrepreneurship Theory and Practice*, 24(1), 49-70.
- Borch, O. J., Madsen, E. L. (2005). Dynamic capabilities and strategic entrepreneurship – An empirical study of innovative SME's, *25<sup>th</sup> Babson College Kauffman Foundation Entrepreneurship Research Conference*. Babson College, Wellington, MA, USA.
- Brown TE, Davidsson P, Wiklund J. (2001). An operationalization of Stevenson's conceptualization of entrepreneurship as opportunity-based firm behaviour, *Strategic Management Journal* 22: 953-968
- Brown, T. E., Kirchoff, B. A. (1997). The effects of resource availability and entrepreneurial orientation on firm growth, in Babson College (Ed.), *Frontiers of entrepreneurship research*, Wellington, MA: Babson College.
- Brush, C. G., Greene, P. G., Hart, M. M. (2001). From initial idea to unique advantage: The entrepreneurial challenge of constructing a resource base, *Academy of Management Executive*, 15(1), 64-78.

- Burgelman, R. A. (1984). Designs for corporate entrepreneurship in established firms, *California Management Review*, 26.
- Carpon, L., Dussauge, P., Mitchell, W. (1998). Resource redeployment following horizontal acquisitions in Europe and North America, *Strategic Management Journal*, 19(7), 631-661.
- Chandler, G. N., Hanks, S. H. (1994). Market attractiveness, resource-based capabilities, venture strategies, and venture performance, *Journal of Business Venturing*, 9, 331-349.
- Cohen, W. M., Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation, *Administrative Science Quarterly*, 35, 128-152.
- Covin, J. G., Slevin, D. P. (1989). Strategic management of small firms in hostile and benign environments, *Strategic Management Journal*, 10(Jan.), 75-87.
- Covin, J. G., Slevin, D. P. (1991). A conceptual model of entrepreneurship as firm behaviour, *Entrepreneurship Theory and Practice*, 16(1), 7-25.
- Dess, G. G., Ireland, R. D., Zahra, S. A., Floyd, S. W., Janney, J. J., & Lane, P. J. (2003). Emerging Issues in Corporate Entrepreneurship. *Journal of Management*, 29(3), 351-378.
- Dess, G. G., Lumpkin, G. T., McGee, J. E. (1999). Linking corporate entrepreneurship to strategy, structure, and process: Suggested research directions, *Entrepreneurship Theory and Practice*, 23(3), 85-102.
- Eisenhardt, K. M., Brown, S. L. (1999). Patching: restitching business portfolios in dynamic markets, *Harvard Business Review*, 78(1), 91-101.
- Eisenhardt, K. M., Martin, J. K. (2000). Dynamic capabilities: What are they? *Strategic Management Journal*, 21, 1105-1121.
- Galunic, D. C., Eisenhardt, K. M. (1994). Renewing the strategy-structure-performance paradigm, in L. L. Cummings B. M. Staw (Eds.), *Research in Organizational Behavior* (Vol. 16, pp. 215-255), Greenwich, CT: JAI Press.
- George, G., Wood Jr, D. R., Khan, R. (2001). Networking strategy of boards: implications for small and medium-sized enterprises, *Entrepreneurship and Regional Development*, 13(3), 269.
- Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation, *California Management Review*, 33(3 Spring), 114-135.
- Greene, P. G., Brush, C. G., Hart, M. M. (1999). The corporate venture champion: a resource-based approach to role and process, *Entrepreneurship Theory and Practice*, 23(3), 103-122.
- Gulati, R., Nohria, Zaheer, A. (2000). Strategic networks, *Strategic Management Journal*, 21(3), 203-215.
- Hamel, G. (2000). *Leading the revolution*, Boston: Harvard Business School Press.
- Hitt, M. A., Ireland, R. D., Camp, S. M., Sexton, D. L. (2002). Strategic entrepreneurship: Integrating entrepreneurial and strategic management perspectives, in M. A. Hitt, R. D. Ireland, S. M. Camp D. L. Sexton (Eds.), *Strategic entrepreneurship. Creating a new mindset*, Oxford, UK: Blackwell Publishers Ltd.
- Husted, K. Vintergaard, C. (2004). Stimulating innovation through corporate venture bases, *Journal of World Business* 39, 296-306.
- Johannisson, B., Alexanderson, O., Nowicki, K., Senneseth, K. (1994). Beyond Anarchy and Organization - Entrepreneurs in Contextual Network, *Entrepreneurship and Regional Development*, 6, 329-356.
- Kickul, J. R., Liao, J. (2004). An immersion into the dynamic capability model of innovation: An empirical test involving e-entrepreneurs, 2<sup>nd</sup> European Summer University, Twente, Netherlands.
- Kirzner I. M. (1973). *Competition and Entrepreneurship*, University Press: Chicago
- Knight, G.A. (1997). Cross-cultural reliability and validity of a scale to measure firm entrepreneurial orientation, *Journal of Business Venturing*, 12 (3) 213-226.
- Kogut, B., Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology, *Organization Science*, 3, 383-387.
- Larsson, A. (1991). Partner Networks: Leveraging External Ties to improve Entrepreneurial Performance, *Journal of Business Venturing*, 6, 173-188.
- Lumpkin, G. T., Dess, G. D. (1996). Clarifying entrepreneurial orientation construct and linking it to performance. *Academy of Management Review*, 21(1), 135-172.
- Madsen, E. L., Borch, O.-J., Wiklund, J. (2006). Developing dynamic capabilities in small firms: The role of entrepreneurial orientation, entrepreneurial activities, and firm performance, 26<sup>th</sup> Babson College Entrepreneurship Conference, Indiana University, Kelly School of Business, Bloomington, Indiana, USA.
- Mahoney, J. T., Pandian, J. R. (1992). The resource-based view within the conversation of strategic management, *Strategic Management Journal*, 13, 363-380.

- March, J. (1991). Exploration and exploitation in organizational learning, *Organization Science*, 2, 71-78.
- McEvily, S. K., Chakravarthy, B. (2002). The persistence of knowledge-based advantage: An empirical test for product performance and technological knowledge, *Strategic Management Journal*, 23(4), 285-305.
- McKelvie, A., Davidsson, P. (2006). From resource base to dynamic capabilities: An investigation of new firms, *Workshop on The practice of dynamic capabilities: Theory development and research*, Lancaster University Management School, UK.
- Miller, D. (1983). The correlates of entrepreneurship in three types of firm, *Management Science*, 29(7), 770-791.
- Miller, D., Friesen, P. H. (1978). Archetypes of strategy formulation, *Management Science*, 24, 921-933.
- Nelson, R., Winter, S. (1982). *An Evolutionary Theory of Economic Change*, Cambridge, MA: Belknap Press.
- Penrose, E. T. (1959). *The theory of the growth of the firm*, New York: John Wiley.
- Reuber A.R. Fischer E. (1999). Understanding the consequences of founders' experience, *Journal of Small Business Management* 37(2): 30-45
- Shane S Venkataraman S. (2000). The promise of entrepreneurship as a field of research, *Academy of Management Review* 25(1): 217-226
- Shane SA. (2003). *A general theory of entrepreneurship: The individual-opportunity nexus*, Edward Elgar: Cheltenham, UK
- Sher, P. J, Lee, V. C. (2004), Information technology as a facilitator for enhancing dynamic capabilities through knowledge management, *Information Management*, 41, 933-945.
- Teece, D. J., Pisano, G., Shuen, A. (1997). Dynamic capabilities and strategic management, *Strategic Management Journal*, 18(7), 509-533.
- Ucbasaran D, Westhead P Wright M. (2001). The Focus of Entrepreneurial Research: Contextual and Process Issues, *Entrepreneurship: Theory and Practice* 25(4): 57-80
- Venkataraman, S., MacMillan, I. C., McGrath, R. G. (1992). Progress in research on corporate venturing, in D. L. Sexton J. D. Kasarda (Eds.), *The state of the art of entrepreneurship*, Boston: PWS-Kent.
- Wernerfelt, B. (1984). A resource-based view of the firm, *Strategic Management Journal*, 5, 171-180.
- Wiklund, J. (1998). *Small firm growth and performance*, (Ph.D. dissertation), Jönköping, Sweden: Jönköping University.
- Wiklund, J. (1999). The sustainability of the entrepreneurial orientation – performance relationship, *Entrepreneurship Theory and Practice*, 37-48.
- Wiklund, J., Shepherd, D. (2003a). Aspiring for, and achieving growth: The moderating role of resources and opportunities, *Journal of Management Studies*, 40(8), 1919-1941.
- Wiklund, J., Shepherd, D. (2003b). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses, *Strategic Management Journal*, 24(13), 1307-1314.
- Wiklund, J., Shepherd, D. (2005). Entrepreneurial orientation and small business performance: a configurational approach, *Journal of Business Venturing*, 20, 71-91.
- Winter, S. G. (2003). Understanding dynamic capabilities, *Strategic Management Journal*, 24(10), 991-995.
- Zahra, S. (ed.) 2005. *Corporate entrepreneurship and growth*, Edward Elgar Publishing Ltd, Cheltenham, UK.
- Zahra, S. A. (1991). Predictors and financial outcomes of corporate entrepreneurship: An exploratory study, *Journal of Business Venturing*(6), 259-285.
- Zahra, S. A., Covin, J. (1995). Contextual influence on the corporate entrepreneurship-performance relationship: A longitudinal analysis, *Journal of Business Venturing*, 10, 43-58.
- Zahra, S. A., Jennings, D. F., & Kuratko, D. F. (1999). The antecedents and consequences of firm-level entrepreneurship: The state of the field. *Entrepreneurship Theory and Practice*, 24(2), 45-64.
- Zahra, S. A., Sapienza, H. J., Davidsson, P. (2006). Entrepreneurship and Dynamic Capabilities: A Review, Model and Research Agenda, *Journal of Management Studies*, 43(4), 917-955.