

The Role of Entrepreneurial Orientation in Achieving Agility Capability

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Abstract

Firms are seeking ways to improve their ability to respond quickly to ever-increasing changes. In this regard, the entrepreneurial orientation (EO) and Agility capabilities come into emergence as new concepts in marketing-management field contributing companies to survive and handling changes. Notwithstanding the importance of these concepts, the majority of researches conducted in relation to these subjects examine their relationship with firm's performance. Also, from one hand, researches focusing on the antecedents of agility capabilities are scarce and literature in this area needs to be extended. From the other hand, Chang et al. (2007)'s call for paper scrutinizing the associations between the dimensions of EO and flexibility (one of the agility capabilities). Therefore, this study aims for filling in the gaps through both the literature of agility and entrepreneurial orientation. Additionally, in the light of multidimensional essence of concepts of agility and EO, the one-to-one study of the relationships between the dimensions of mentioned concepts is needed for precise illumination of this issue. Our finding showed that EO has a strong influence on agility capability. Also, innovativeness positively affects responsiveness, flexibility Competency, and quickness; risk-taking impact positively on responsiveness, competency, and quickness. Proactiveness lays positive influence on responsiveness; competitive aggression puts positive influence on responsiveness, competency and quickness; and eventually, autonomy affects flexibility and quickness.

Keywords: Agility capabilities, Entrepreneurial orientation, innovativeness, Competitive aggressiveness, responsiveness.

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1. Introduction

Nowadays, firms are seeking to cultivate their ability to respond promptly and appropriately to changes of various environmental factors along with heightened competition in the business environment, thereby they can benefit paucity opportunities in business environment and achieve competitive advantage by begetting greater value for customers and improve their own strategic position in comparison to competitors. In this circumstance, miscellaneous concepts pertained to handling this changing situation has been posed in marketing-management literature during past two decades. For instance, market-orientation, competitive intelligence, agility and entrepreneurial orientation are some of this stream of thought. The concept of entrepreneurial orientation (EO) comes into emergence as a new concept contributing companies to survive and attain superior performance in turbulent environment (e.g. Barringer and Bluedorn, 1999; Dimitratos and Plakoyiannaki, 2003; Hitt et al., 2001). EO enables firms to discover and exploit market opportunities (Barringer and Bluedorn, 1999; Wiklund and Shepherd, 2003) and respond to challenges appropriately (Lumpkin and Dess, 1996).

Simultaneously, with the heed to the continuous economic, technological, political, social changes as well as market-related changes, firms must try to be agile for survival and proper performance, meaning that they must understand and predict the changes of business environment and respond to them as quick as possible (Dove, 2001; Goldman et al., 1995; Overby et al, 2006). Accomplishing this end requires development of four basic capabilities, which are usually referred as agility capabilities, in order to sense and respond properly to environmental changes. These four capabilities are: responsiveness, competency, flexibility and quickness (speed).

Notwithstanding the importance of concepts of agility and EO, the majority of researches conducted in the field of EO examine its relationship with firm's performance (e.g. Covin et al., 2006; Dimitratos et al., 2004; Lumpkin et al., 2006; Stam and Elfring, 2008; Wiklund and Shepherd, 2003). On the other hand, researches focusing on the antecedents of agility capabilities are scarce and literature in this area needs to be extended. Therefore, this study helps both to the literature of agility and entrepreneurial orientation. Further, on account of the fact that quite limited number of studies have investigated the positive effect of EO on flexibility (one of the agility capability) (e.g. Chang et al., 2007) or speed of strategic change (e.g. Li et al., 2011), despite theoretical foundation in the literature, the relationship between EO and agility capabilities has not been empirically examined yet. Moreover, by scrutinizing the associations between the dimensions of EO and flexibility (one of the agility capabilities) this study responds to Chang et al. (2007)'s request to evaluate the effect of EO on flexibility in other business areas and expands their findings. Thus, this study tries to extend the literature of agility and entrepreneurship as well as fill the research gap by examining empirically the relationship between EO and agility capabilities that have not been investigated in the literature hitherto. Additionally, in the light of multidimensional essence of concepts of agility and EO, the one-to-one study of the relationships between the dimensions of mentioned concepts is needed for precise illumination of this issue.

The rest of this paper is organized as follows. As a threshold issue, research literature and theoretical foundation of hypotheses is propounded. Afterwards, the methodology of the study is brought up. Subsequently, the result of model and hypotheses testing are presented. Eventually, conclusion and implications of the study are adduced.

2. Background and literature

2.1. Literature Review

2.1.1. Entrepreneurial orientation

Entrepreneurship has often been reflected as a characteristic of an innovative and risk-taking individual attempting to achieve commercial success (Morris and Paul, 1987) But as a concept in organization, EO has been recently conceptualized as a culture within the firms and a resource to obtain competitive advantage in marketing and strategic management's literature as consequence of the resource-based view of firm (RBV) (Dess et al., 2003; Drucker, 1985; Tajeddini, 2010).

EO concentrates on facilitating the exchanges between organization and its environment (Miller and Friesen, 1983; Morris and Paul, 1987). To cast more light on this issue, the traditional school of thought regarding environments holds that external changes like environmental dynamism, complexity, and turbulence overshadow organizational performance and the survival of organizations is conditional on the ability of them to adapt with this fluctuating situation. But on the basis of new thought, successful companies are often those initiating changes in technology, marketing or organization and manage to keep a lead in changes over competitors. This type of philosophy is the essence of entrepreneurship (Pinchot, 1985).

As Miller (1983, p. 780) stated: "the firm that changes its technology or product-line would not be called entrepreneurial or simply by directly imitating competitors while refusing to take any risks. Some proactiveness would be essential as well. By the same token, risk-taking firms that are highly leveraged financially are necessarily entrepreneurial. They must also engage in product-market or technological innovation."

EO refers to firm's ability to renew, innovate and taking risks in its activities (Naman and Slevin 1993). There exist many definitions of entrepreneurial orientation. To put a definition from marketing viewpoint, Morris and Paul (1987) asserted that EO is the organization's willingness to take calculated risk, being innovative and to demonstrate proactiveness. Lumpkin and Dess (1996) added "propensity to act autonomously " and " tendency to be aggressive toward competitors" to their definition.

As it could be inferred from the definition, entrepreneur corporations allocate their resources to projects that their results are not thoroughly clear and require taking risks. They are seeking to developing and introducing new products, methods, technologies (innovation), anticipating the needs and demands of market and creating an advantage beyond competitors (proactivity) (Bojica and del Mar Fuentes Fuentes, 2012). Since entrepreneur corporations have great ability to improve the economic performance of society, they are referred as the engines of economic growth and employment generation (Zahra and Covin, 1995). Hence, there is a strong interest in what entrepreneurial behavior looks like and in its consequences in the corporate context from when Miller (1983) introduced EO into the academic literature.

After reviewing the literature pertained to the concept of EO, it could be induced that entrepreneurial-oriented firm are recognized with five main characteristics, as previously identified by Miller (1983) and Lumpkin and Dess (2001) which are innovation, risk-taking,

proactiveness, competitive aggressiveness and autonomy. To pose the description for each dimension, Innovation implies engagement and commitment of firm to adhere to new ideas, novelty, experimentation and creativity that may result in introducing new products, methods and processes (Lumpkin and Dess, 1996; Wang, 2008).

Risk-taking reflects firm's tendency to advocate creative activities even when the outcome of these activities is not certain. In effect, risk-taking is illustrative of the extent to which managers are willing to make large and risky resource commitments—i.e., those which have a reasonable chance for a costly failure.

Proactiveness is predicated to firm's tendency to pursue available opportunities in the market and emphasis on being pioneered to apply innovations in the industry (Hornsby et al., 1993). In other words, Proactiveness is indicative of the degree to which a firm act in anticipation of future market needs and changes (Lumpkin and Dess, 1996) by “seeking new opportunities which may or may not be related to the current line of operations, introduction of new products and brands ahead of competition, and strategically eliminating operations which are in the mature or declining stages of their life cycle” (Venkatraman, 1989 p. 949).

Competitive aggressiveness is defined as firm's willingness to challenge its competitors directly in an effort to improve its own position in the market (Lumpkin and Dess, 1996). Finally, autonomy refers to decision making of human force and various units on efficient functioning of their activities (Hornsby et al., 1993).

In short, firms with entrepreneurial postures are risk-taking, innovative, and proactive. They are willing to take on high-risk projects with chances of very high returns, and are bold and aggressive in pursuing opportunities (Covin and Slevin, 1991). Entrepreneurial organizations often initiate action to which competitors respond later, and are frequently first-to-market with new product offering (Covin and Selvin, 1991). Thus, EO is mentioned as a key feature for the success of the organizations (Lumpkin and Dess, 2001; Wiklund and Shepherd, 2005). EO caters strategic posture for organizations to renew corporations' offering to market, accept risks for provision of new products to market and precede competitors in identifying and exploiting available opportunities in the market (Covin and selvin, 1991; Lumpkin and Dess, 1996; Wiklund and Shepherd, 2005). EO allows firms to be at the leading edge in competition and gain a larger market share in domestic and foreign markets (Zahra et al., 2009). Several studies have investigated and approved the positive impact of EO on firm performance but the impact of EO on other company's capability is not well studied.

2.1.2. Agility

How firms can dominate dynamic and unpredictable business environment has been recently proposed as an important issue both in administrative and academic field. Overall, there are two main approaches in this area. Static approach emphasizes organizational structure and structural flexibility as a key factor in accordance with the changing environment and dynamic approach concentrates on how to create, develop and reconfigure capabilities that assist firm to deal with its changing environment (Eisenhardt and Martin, 2000; Teece et al., 1997).

One of the concepts emanated from dynamic view was the concept of agility that quickly turned into the strategic tool to achieve success and a solution to manage the impacts of complexity and dynamics of business environment on organization.

Agility has been defined as being able to move quickly and in easy way (American Heritage Dictionary of the English Language, 2000). But the concept of agility as it is currently considered in management and marketing was engendered by the concept of flexibility in economics and was employed by a group of researchers at Iacocca Institute in 1991. Since the advent of this concept, numerous definitions have been proposed some of which are provided in Table 1.

Table 1: The definitions of agility

<i>Source</i>	<i>Definition</i>
Iacocca (1991)	Ability of a system to change quickly between products' model and production lines to respond to customers' needs at the right time.
Kidd, 1994	Ability to adapt quickly the organization elements with unexpected and unpredictable changes
Goldman et al., 1995	Comprehensive response to the challenges of business environment i.e. profitability of rapid changes, restructured products based on customers and global markets for superior quality.
Sharifi and Zhang, 1999	Ability to respond to unforeseen and unexpected changes in the right way and at the right time and the exploitation of these changes via changing them to opportunities
Day, 2000	The ability of an organization to grow in variable and unpredictable business environment
Sambamurthy et al., 2003	Ability to identify and exploit market opportunities through providing required assets, knowledge and communication
Overby et al., 2006	Ability to understand environment changes and respond quickly to them

Two main deductions can be evolved from definitions posed above. First, agility is conceived as an organizational capability and a set of processes that effectuate a certain output (Dove, 2001). Second, the essence of agility is based on two issues: Sensing changes and responding to them quickly.

After the appearance of agility concept in 1990s, researchers began to theorize it and offer conceptual model in this context. The vast majority of researches in agility regarded three main areas: agility drivers, agility capabilities (attributes) and agility enablers (providers).

Various studies have identified different factors as a source or stimulus toward agility in organizations that the offspring of them is "change". These changes that now are transpiring faster than ever, may come to pass in the market, competition, consumers, technology and social factors (Lin et al., 2006; Sharifi and Zhang, 1999). To recapitulate the results of researches in this area, the origin of changes in business environment can be provided in five general categories: (1) prompt changes in the market in the light of growing niche markets, introducing new products and reducing the life of product (2) ever-increasing competition in the wake of highly variable markets, increase of cost pressures and international competition, (3) changes in customer requirements in view of demand for customized products, the increase of expected quality and the need for shorter delivery times (4) accelerating technological change and growth through continuous introduction of new and efficient production facilities and integration of systems, and (5) change in social

factors owing to protection of environment, workforce expectations or workplace and legal pressures (Lin et al., 2006; Ren et al., 2001; Sharifi and Zhang, 1999; Yusuf et al., 1999).

Agile organizations centralize on how to conquer the uncertainties, complexity and environmental changes accompanied by create an appropriate response to such changes. Hence, agile organizations must be equipped with specific attributes to help them gain agility. These capabilities (attributes) encompass four main categories including responsiveness, competency, flexibility and quickness (Lin et al., 2006; Sharifi and Zhang 1999; Yusuf et al., 1999). Sharifi and Zhang (1999) described these four capabilities as follows:

- Responsiveness is the ability to perceive and respond quickly to changes and recover from them.
- Competency is considered as a set of capabilities that provide productivity, efficiency and effectiveness to firm aiming to achieve its goal.
- Flexibility reflects the ability to produce and offer different products and the ability to pursue different objectives with firm's current facilities
- And ultimately, quickness implies the ability to carry out processes and operations in shortest possible time.

It could be noted that agility enablers (providers) purvey the required bedrocks and situations to create the attributes of agility. Yusuf et al. (1999) delineated items as agility enablers and grouped them into 4 categories: (1) core competency management (2) virtual enterprise (3) Capability for reconfiguration, and (4) Knowledge-driven enterprises, whereas Sharifi and Zhang (1999) discussed that these attributes are obtainable through four areas of organization, staffing, technology and creativity are obtainable.

In addition, by emphasizing the necessity to utilization of information systems and information technology, they contended that achieving agility capabilities without aforementioned facilities seems impossible. Other researchers added other items to agility enablers including cooperative relationship, process integration, information integration and customer/marketing sensitivity (Lin et al., 2006) as well as the organization of business processes (Tseng and Lin, 2011).

The ultimate goal of deploying agile strategies is to enrich customers and satisfy their needs properly and at the right time (Lin et al., 2006). Applying agility-based strategies lay on numerous merits for organizations, among them it can be referred to the ability to respond quickly and effectively to changing market needs, high ability to provide customized products to customers, ability to provide new products to market at lower prices (Swafford et al., 2006), reduce production costs, increase customer satisfaction, elimination of non-value-added activities and increase competitiveness (Tseng and Lin, 2011).

Given the rapid changes in environmental elements, agility is characterized as a fundamental attribute for organizations' survival and competition (Bottani, 2009; Ganguly et al., 2009) which is remembered as an effective strategy to gain leadership in markets (Yusuf et al., 1999).

Despite the importance of the agility and EO, the majority of researches done in the sphere of EO examine its relationship with firm's performance (e.g. Covin et al., 2006; Dimitratos et al.,

2004; Lumpkin et al., 2006; Stam and Elfring, 2008; Wiklund and Shepherd, 2003) and researches investigating the effect of EO on other organizational capability are limited over the literature. Further, most of the researches in the realm of agility are about subjects like the role of agility in supply chain (e.g. Christopher and Towill, 2001; Khan K and Pillania, 2008; Li et al., 2006; Li et al., 2009; Rigby et al., 2000) or evaluation and measurement of agility (e.g. Yauch, 2011). On the other hand, except studies regarding the role of IT on agility (e.g. Auramo et al., 2005; Overby et al., 2006; Reddy and Reddy, 2002; Zain et al., 2005), researches focusing on the antecedents of agility capabilities are monotonic and scarce. Thus, literature in this area needs to be developed that in which ways it is possible to extend the agility capabilities through organization. Furthermore, this study responds to Chang et al. (2007)'s request to evaluate the effect of EO on flexibility (one of the capabilities needed for agility) in other business areas and expands their findings. Therefore, this study tries to extend the literature of agility and entrepreneurship as well as fill the research gap by examining empirically the relationship between EO and agility capabilities that have not been investigated in the literature by now. In addition, due to multidimensional essence of concepts of agility and EO, the one-to-one study of the relationships between the dimensions of mentioned concepts is needed for precise illumination of this subject.

2.2. Theoretical background and hypotheses

2.2.1. Entrepreneurial orientation and agility capabilities

EO mainly represents a response of firms to future or potential market needs. That the concepts of EO and agility are a basis for firms' successes in confronting with the changing situation and its management, it seems logical to consider them as related concepts in organizations.

Moreover, as mentioned earlier, agility is considered as a function of sensing environmental changes and responding to them as prompt as possible (Overby et al., 2006). In this regards, there are many piece of evidence through the literature regarding that firms with high levels of entrepreneurial orientation tend to constantly scan and monitor their operating environment in order to find new opportunities and strengthen their competitive positions that may result in higher sensing capability (Covin and Miles, 1999) and also entrepreneurial organization must exploit identified opportunities before they were targeted by competitors. So they must be able to respond to opportunities as quick as possible. Further, Drucker (1968) explained the task of entrepreneurial orientation as seeking change, responding to change and exploiting change as an opportunity and Zahra et al. (2008) suggested that entrepreneurial orientation-based activities allow firms to organize their own processes in an efficient, agile and rapid way in reaction to changing market conditions. Therefore, it can be posed that:

H1: EO leads to an increase in agility capabilities.

2.2.2. The dimensions of EO and agility capabilities

Those firms that act in turbulent markets should improve their own offerings to the market periodically and innovate so as to respond to the changing customer preferences (Jaworski and Kohli, 1993; Slater and Narver, 1994). A broader definition of innovation includes not only product or service innovations but also innovations in production processes and technologies and administrative processes which can contribute toward significant cost reductions and operational efficiency (Gatignon and Xuereb, 1997). As Lumpkin and Dess (1996) and Frese et al. (2002)

professed, the presence of innovation in organization reinforces firm's potential to engage in research and development activities for novelty which may eventually conduce to the creation of new products, new processes and new technological developments. Innovation even can change the way data are collected and applied in an appropriate manner (Slater and Narver, 1995). Accordingly, innovation can better firm processes related to managing business environment and begetting innovative strategies to make appropriate response.

Beyond that, technological innovation helps firms to identify new opportunities in the market and exploit them by providing new products faster than their competitors (Chen et al., 1992). Also, previous research has shown that innovation leads to increase in volume flexibility, new product flexibility and product mix flexibility (Chang et al., 2007). So, following hypotheses are proposed:

H2: Innovation leads to an increase in responsiveness.

H3: Innovation leads to an increase in competence.

H4: Innovation leads to an increase in flexibility.

H5: innovation leads to an increase in quickness.

Entrepreneurial firms join to invest in utilizing new and untested processes and technologies in virtue of their risk-taking entity that succors them to provide new products to the market in order to satisfy the demand of their customers (Lumpkin and Dess, 1996). This processes and facilities could be consisted of new methods and hardware in monitoring the markets of new production methods. Therefore, it can be concluded that EO leaves influence on both responsiveness and quickness.

Furthermore, the use of new business processes through various ways consist of drawing on new methods for training and empowerment of personnel, reducing the waste of processes, increasing product quality and providing the required software and hardware tools engender an increased ability to improve productivity, efficiency and effectiveness of firm's processes in the way of achieving its objectives. Also, several studies examined and approved the positive relationship between risk-taking of entrepreneurial firms in implementing new processes and technologies and increasing firm ability in production levels and flexibility (e.g. Chang et al., 2007; Nohria and Gulati, 1997). Therefore:

H6: Risk-taking leads to an increase in responsiveness.

H7: Risk-taking leads to an increase in competency.

H8: Risk-taking leads to an increase in flexibility.

H9: Risk-taking leads to an increase in quickness.

Proactiveness, the third dimension of EO, implies a forward-looking view by means of which firms scan opportunities to develop and recommend new or modified products, identify future trends in the market and change current strategies and tactics (Lumpkin and Dess, 1996; Slater and Narver, 1995). As to the difference between reactivity and proactiveness, it could be noted that reactivity is about to react to happened changes but proactiveness implies anticipating probable future changes. Proactivity eventuates to increase in responsiveness through increasing firm's receptiveness with the purpose to understand market signals and be informed of customer needs (Hughes and Morgan, 2007).

Proactive firms are those having the tendency to lead, rather than follow other competitors, in terms of developing new procedures, technologies, and new products or service (Covin and Slevin, 1989). Moreover, as mentioned in the definition of proactivity, one of the characteristics to be proactive is an emphasis on being pioneer in using innovations through industry (Hornsby et al., 1993). Proactive firms armed with the vision catered by anticipation of future trends could have better schedule for their produce and expand their produce capacity. Also, the research conducted in this field has demonstrated that proactiveness ends up in flexibility (Chang et al., 2005; Chang et al., 2007). Therefore, the following hypotheses are put forth:

H10: Proactiveness leads to an increase in responsiveness.

H11: Proactiveness leads to an increase in flexibility.

Competitive aggressiveness refers to “the intensity of a firm’s efforts to outmaneuver and undermine its industry’s rivals to enhance its competitive position” (Lumpkin and Dess, 2001). High tendency toward aggressiveness necessitates continuous assessment of competitors’ strategies to meet customers’ needs which hinge on the growth of firm’s receptiveness from changes in market conditions (Hughes and Morgan, 2007). Firms with high aggressiveness try to accomplish entailed measures to enervate rivals’ activities and remain secure from their aggressive actions.

As Lumpkin and Dess (1996) stated, the purpose of aggressive firms is to focus on improving their current performance and making their actions ineffective. Efforts to ameliorate firms’ activities effectuate efficiency and effectiveness of activities in attaining the objectives and consequently heighten competency capability. Also, the presence of aggressive spirit in organization is a driving force to uphold the required capabilities in an endeavor to identify environmental changes and respond to them in a concise time so that make their strategies ineffective. In addition, aggressive firms must do actions rapidly after perceiving changes in competition situation. Lastly, entrepreneurial firms tend to conjugate aggressively on the development of their products, methods and process, so their flexibility will be increased (Chang et al., 2007). Therefore, the following hypotheses are proposed:

H12: Aggressiveness leads to an increase in responsiveness.

H13: Aggressiveness leads to an increase in competency.

H14: Aggressiveness leads to an increase in flexibility.

H15: Aggressiveness leads to an increase in quickness.

Autonomy paves the way for employees to pursue opportunities while they are self-directed, act and decide independently and vindicate new ideas. Self-directed teams provide the opportunity for organizational learning and knowledge sharing that both reduce the time required to perform firm activities, particularly new product development (Senge, 1990) that could result in quickness of firm in conducting processes and consequently efficiency and effectiveness. Therefore, autonomy could generate quickness and competency. Muthusamy et al., (2005) showed that more autonomy encourages freethinking exchange of information in the organization and gives freedom to search and test new ways in order to tackle problems. Further, previous empirical research in this regard has represented that autonomy procures flexibility for firms (e.g. Chang et al., 2007).

Accordingly:

H16: Autonomy leads to an increase in competency.

H17: Autonomy leads to an increase in flexibility.

H18: Autonomy leads to an increase in quickness.

The stated relationships in research hypotheses are shown on the conceptual model (Figure 1).

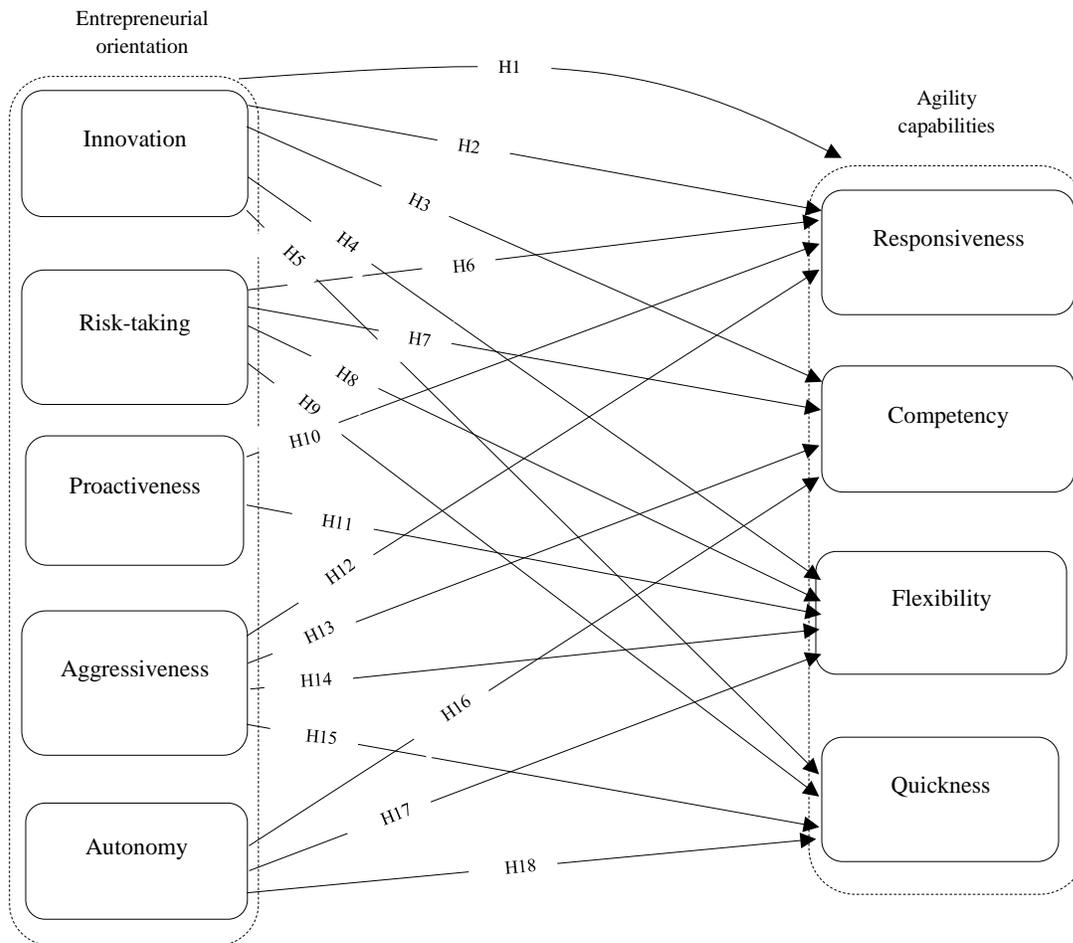


Figure 1: Conceptual model of research

3. Data and method

3.1. Sample and data collection

Quantitative research method was utilized in this study and survey approach was used to collect primary data. Also, library studies and online databases were used to collect and describe the theoretical foundation of the study. The population in the study was the firms listed in the Tehran Stock Exchange. We selected all manufacturer companies listed in as statistical sample of study in that concepts such as agility emerges from manufacturing industries and also this concept is more perceptible in manufacturing contexts. After initial preparations, research questionnaire was dispensed among the CEO and board members of selected sample in that they are completely

aware of corporation's policies, performance and difficulties. From 579 questionnaires, 112 questionnaires were returned (response rate: 19.3%), among which 106 questionnaires were reliable, complete and analyzable that were utilized for quantitative analysis.

3.2. Measures

To measure research constructs, respondents were asked to specify their response about questions presented in five points Likert-type scales ranged from (1) strongly disagree through (3) neutral to (5) strongly agree. The questionnaire included three main sections: descriptive information, questions related to entrepreneurial orientation and questions related to the agility. Since research was carried out in non-English language country, the questionnaires were prepared in English language, then they were translated into Persian language and later they were again translated into English so that respondents can get the exact meaning of questions.

Structured questions of questionnaire were derived from a detailed and exact study of relevant literature. Questions associated to five dimensions of EO were taken from Miller (1983) and Lumpkin and Dess's studies (2001). Dimensions intended for EO were innovation (3 items), risk-taking (2 items), proactiveness (3 items), aggressiveness (2 items) and autonomy (3 items). Questions pertained to agility capabilities were adopted from research done by Sharifi and Zhang (1999) which were previously used by other researchers (e.g. Tseng and Lin, 2011; Lin et al., 2006). This construct consisted of four dimensions: responsiveness (3 items), competency (10 items), flexibility (4 items) and quickness (3 items). Their relevant dimensions and questions are shown in Table 2.

4. Results

In this part, model assessment and structural model analysis performed by SmartPLS 2.0 software are presented. PLS Software gives the possibility for testing hypotheses through partial least squares analysis. Partial least squares analysis is a multivariate technique that estimates unobservable latent variables through different indexes and investigation of path between these variables. Analysis based on partial least squares doesn't need the normality assumption of data distribution and large sample size.

4.1. Measurement model

Before structural equations modeling, there is a need to assess the reliability and validity of questions and measurement model. In order to estimate validity, construct validity as well as convergent and divergent validity were used and to investigate the reliability of research's constructs, composite reliability was deployed.

Construct validity shows that whether selected indicators have the required accuracy to measure their own constructs or not. To this end, confirmatory factor analysis (CFA) is used. If the factor loading of each question with its own construct has significant t-value at 0.05 level of significance (t-value must be more than 1.64) and the factor loading of each indicator with its own construct is higher than 0.50, the indicator has the required accuracy to measure latent construct. After initial implementation of the model, the factor loadings pertained to one of innovation's questions and 3 questions of competency were below the threshold value (0.50). Therefore, the question of innovation and the question of competency with the least factor loading were eliminated and model was implemented again. We resumed this process till when all load factors

were more than threshold value of 0.50. Overall, we excluded 1 item from innovation and 3 items from the competency to attain the qualification of construct validity. The factor loadings related to each question are presented in Table 2.

Table 2: Measurement items and factor loadings

<i>Construct</i>	<i>Dimension</i>	<i>Item</i>	<i>Factor loading</i>
Entrepreneurial orientation	Innovativeness	The top managers favor a strong emphasis on R&D, technological leadership, and innovations (excluded)	0.27
		My firm has very many new lines of products/services marketed in the past 5 years	0.84
		Changes in product or service lines have usually been quite dramatic	0.89
	Risk-taking	My firm usually has a strong proclivity for high risk projects (with chances of very high returns)	0.74
		Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives	0.87
	Proactiveness	In dealing with competitors, my firm usually initiates actions which competitors then respond to	0.88
		In dealing with competitors, my firm is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc.	0.91
		In general, the top managers of my firm have a strong tendency to be ahead of others in introducing novel ideas or products	0.87
	Competitive aggressiveness	My firm usually adopts a very competitive "undo-the-competitors" posture	0.86
		My firm is very aggressive and intensely competitive	0.85
	Autonomy	My firm has the independent action of an individual or a team in bringing forth an idea or a vision and carrying it through to completion	0.88
		My firm has the ability and will to be self-directed in the pursuit of opportunities	0.82
		My firm takes action free of stifling organizational constraints	0.82
Agility capability	Responsiveness	My firm has the ability to sense, perceive and anticipate changes in market	0.91
		My firm immediately react to changes by effecting them into system	0.92
		My firm has the ability to recover itself from changes	0.68
	Competency	My firms have strategic vision	0.83
		My firm has appropriate and sufficient technological ability (excluded)	0.242
		My firm 's products/services quality is appropriate	0.63
		My firm has cost effectiveness in conducting its processes	0.74
		In my firm, the rate of new product/service introduction is high (excluded)	0.38
		In my firm, change management is carried out in order to recovery from changes (excluded)	0.42
		There exist knowledgeable, competent, and empower people in my firm	0.72
		The way of accomplishing the operations has the required efficiency and effectiveness	0.93
		There is appropriate cooperation (internal and external) through the firm	0.84
		There exists required integration across the firm	0.84
	Flexibility	My firms have the ability to produce/present different levels of product/service volume with same facilities	0.87
		My firms have the ability to produce/present different model/configuration of product/service with same facilities	0.94
	Quickness	My firm has the flexible structure and organizational issues flexibility	0.86
		New product time-to-market is quick in my firm	0.73
My firm delivers product/service quickly and in time.		0.78	
		The operation time in my firm is fast	0.81

Moreover, the convergent and divergent validity were used to assess the validity of the research constructs. As it is seen in Table 2, to measure convergent validity, the average variance extracted (AVE) pertained to each of construct dimensions was calculated. Values were in the range of 0.61 and 0.80, which were more than recommended threshold value of 0.50 (Bagozzi and Yi 1988). Divergent validity was tested through analysis of variance shared between pairs of latent constructs which was raised by Fornell and Larcker (1981). As can be deduced from Table 2, the correlation between each pair of constructs does not exceed the squared variance extracted for each construct (which is on the main diagonal of the correlation matrix), so research's constructs have divergent validity.

The reliability of model's dimensions was measured by composite reliability (CR). As Table 3 demonstrates, composite reliability values are higher than the minimum threshold value, 0.70; thus, model dimensions have adequate reliability (Hair et al., 2010).

Table 3: Measure correlations, means, standard deviations (SD), composite reliability and AVE

	Mean	SD	CR	AVE	Innovativeness	Risk-taking	Proactiveness	Competitive aggressiveness	Autonomy	Responsiveness	Competency	Flexibility	Quickness
Threshold			≥0.7	≥0.5									
Innovativeness	3.44	0.58	0.86	0.75	0.86								
Risk-taking	3.00	0.94	0.79	0.65	0.48	0.80							
Proactiveness	3.37	0.73	0.92	0.79	0.52	0.71	0.89						
Competitive aggressiveness	2.95	0.89	0.84	0.73	0.43	0.63	0.71	0.85					
Autonomy	3.19	0.76	0.85	0.65	0.59	0.73	0.73	0.68	0.80				
Responsiveness	3.44	0.85	0.88	0.71	0.48	0.58	0.53	0.70	0.71	0.84			
Competency	3.24	0.69	0.92	0.63	0.46	0.63	0.66	0.70	0.62	0.81	0.79		
Flexibility	2.96	0.81	0.92	0.80	0.69	0.59	0.54	0.58	0.72	0.77	0.66	0.89	
Quickness	3.24	0.76	0.82	0.61	0.64	0.67	0.54	0.68	0.76	0.60	0.61	0.60	0.78

Notes: Values on the diagonal are the square-root of the average variance extracted for each construct (AVE).

Further, to confirm model strength and stability, fitness indexes were calculated. In PLS, goodness of fit is obtained from the geometric mean of two average communality criteria (is provided at software output) and mean squared correlation coefficients i.e. $GoF = \sqrt{communality \times R^2}$. The value of GoF was calculated 0.48, which is more than the minimum proposed value (Fornell and Larcker, 1981). Therefore, the proper fitness of model is supported.

4.2. Hypotheses Testing

To test hypotheses, path analysis was used which is a multivariate regression allows to study the causal relationship between two or more variables. Path coefficients and t-values are given in Table 4. To support or reject hypotheses, significance coefficient (t-statistics) was used. If t-value is more than 1.64 (at the significance level of 0.05), the hypothesis is supported and a significant relationship between two latent variables is obtained; otherwise it is not supported.

Table 4: Results of testing the research hypotheses

No	Hypothesis	Path coefficient	t-value	Result
H1	EO leads to increase in agility capability	0.76	15.84***	Supported
H2	Innovativeness leads to increase in responsiveness	0.23	1.97*	Supported
H3	Innovativeness leads to increase in competency	0.36	2.91**	Supported
H4	Innovativeness leads to increase in flexibility	0.42	3.71***	Supported
H5	Innovativeness leads to increase in quickness	0.31	3.44***	Supported
H6	Risk-taking leads to increase in responsiveness	0.13	1.70*	Supported
H7	Risk-taking leads to increase in competency	0.15	1.76*	Supported
H8	Risk-taking leads to increase in flexibility	0.11	1.19	Not supported
H9	Risk-taking leads to increase in quickness	0.23	1.97*	Supported
H10	Proactiveness leads to increase in responsiveness	0.32	2.60**	Supported
H11	Proactiveness leads to increase in flexibility	-0.17	1.04	Not supported
H12	Competitive aggression leads to increase in responsiveness	0.49	4.41***	Supported
H13	Competitive aggression leads to increase in competency	0.37	2.44**	Supported
H14	Competitive aggression leads to increase in flexibility	0.07	0.70	Not supported
H15	Competitive aggression leads to increase in quickness	0.38	2.97**	Supported
H16	Autonomy leads to increase in competency	0.04	0.23	Not supported
H17	Autonomy leads to increase in flexibility	0.40	2.50**	Supported
H18	Autonomy leads to increase in quickness	0.43	2.64**	Supported

Notes: * P < 0.05, ** P < 0.01, *** P < 0.001

Based on results, innovation could impact on improving the capabilities of responsiveness, competency, flexibility and quickness (speed) through the use of new technologies, processes and methods, the effect of innovation on the capabilities of responsiveness ($\beta=0.23$, $t=1.97$), competency ($\beta=0.36$, $t=2.91$), flexibility ($\beta=0.42$, $t=3.71$) and quickness ($\beta=0.31$, $t=3.44$) was confirmed. Therefore, innovation increases mentioned capabilities. As to the proposed hypotheses about the impact of risk-taking on agility capabilities, hypothesis testing revealed that risk-taking has positive effect on firm's responsiveness capability ($\beta=0.13$, $t=1.70$), competency ($\beta=0.15$, $t=1.76$), and quickness ($\beta=0.23$, $t=1.97$) but the influence of risk-taking on flexibility is not supported in this research ($\beta=0.11$, $t=1.19$).

Also, the hypothesis 10 that is the illustrative of the effect of proactiveness on responsiveness was accepted ($\beta=0.32$, $t=2.60$) but the hypothesis 11 related to the impact of proactiveness on flexibility was rejected ($\beta= -0.17$, $t=1.04$) which indicates that proactiveness doesn't lay any effect on flexibility unlike previous researches. In addition, the results confirmed that aggressiveness is effective on increasing responsiveness ($\beta =0.49$, $t=4.41$), competency ($\beta =0.37$, $t=2.44$) and quickness ($\beta =0.38$, $t=2.97$), but has no effect on flexibility ($\beta =0.07$, $t=0.70$). Further, the results of study confirmed the effect of autonomy on flexibility ($\beta =0.40$, $t=2.50$) and quickness ($\beta =0.43$, $t=2.64$), but its effect on competency wasn't supported ($\beta =0.04$, $t=0.23$). Finally, hypothesis 1 related to the positive impact of entrepreneurial orientation on agility capabilities was tested and the results showed that EO has a significant impact on agility capabilities ($\beta =0.76$, $t=15.84$). Therefore, firms can improve their own agility capabilities by strengthening and developing entrepreneurship characteristics.

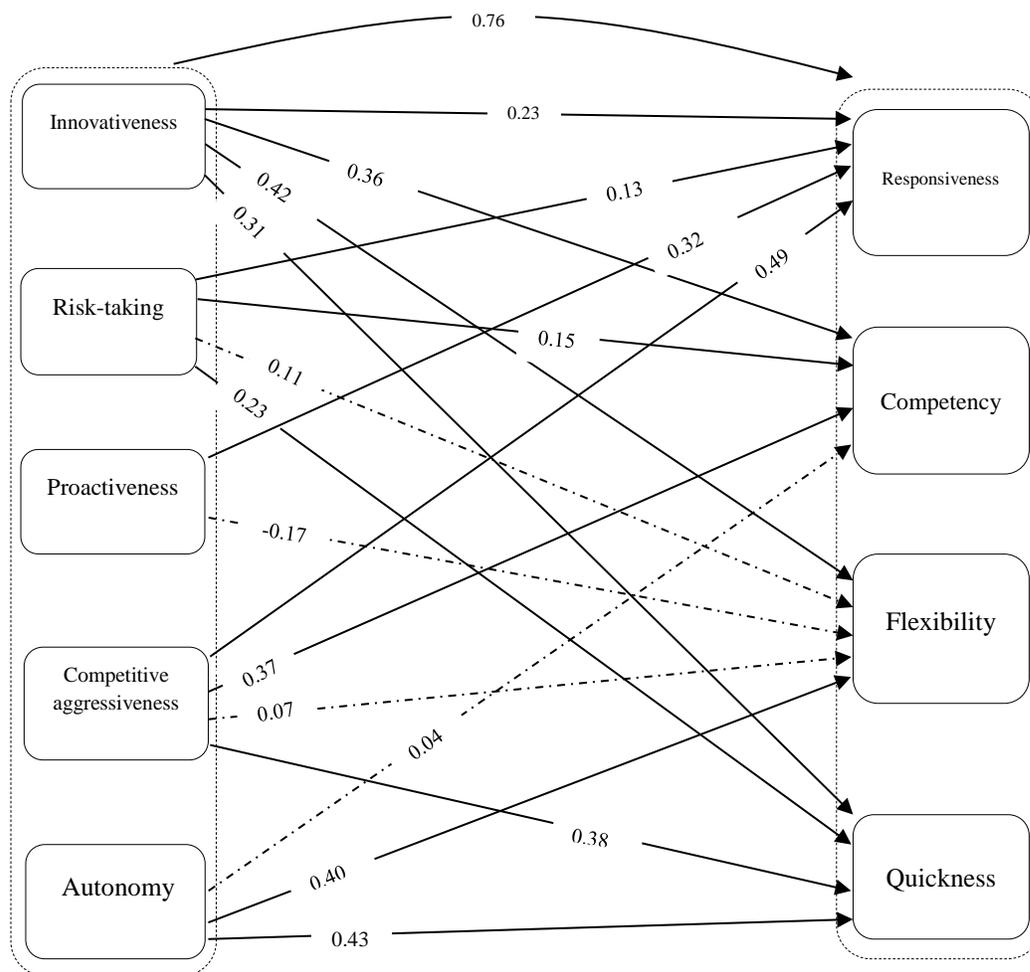


Figure 2: Path analysis model

Notes: 1) The dashed lines refer to insignificant paths.
 2) Paths are significant at the 0.05 level.
 3) Goodness-of-fit index=0.48.

5. Discussion and conclusion

The main purpose of this study is to clarify whether entrepreneurial orientation leaves any influence on agility capability of firms or not. To do so, the casual relationship between to constructs was investigated. Moreover, to cater more profound apprehension of this subject, the effect of quintuple dimensions of EO (innovation, risk-taking, proactiveness, autonomy and aggressiveness) on four dimensions of agility capabilities (responsiveness, competency, flexibility and quickness) were scrutinized. The considerable result of this study is that EO impacts on agility capabilities (that is a main solution to overcome environmental uncertainties). Turning to details, the results of this study uncovers that innovation affect responsiveness, competency, flexibility and quickness. Risk-taking can also impress organization responsiveness, competency and quickness and proactiveness doesn't impact flexibility but ameliorates responsiveness capability. Further, the results disclose a positive impact of competitive aggressiveness on the increase of

responsiveness, competency and quickness, and ultimately, autonomy affects positively flexibility and quickness.

Unlike the majority of research on entrepreneurial orientation that inquires its effect on firm's performance, this study examines the impact of EO on other organizational capabilities (agility capability). This study confirms the results of studies done by Covin and Slevin (1989 and 1991), Zahra (1993) and Wiklund and Shepherd (2005) through investigating how entrepreneurial orientation can help firm to overcome environmental uncertainties.

Also, this study unlike other studies that examine the agility-performance relationship, investigates agility antecedents and by going beyond hardware facilities (IT capabilities) suggests that agility capabilities are attainable through planning and access to other management capabilities.

Furthermore, present study provides practical implications for companies and their senior executives. First, research results unveiled that, as Sharifi and Zhang (1999) introduced innovation as one of agility enablers, this research empirically confirmed that this concept imposes positive impact on agility capabilities. It is clear-cut that those firms with tendency toward innovation can increase their own capacity to respond to environmental changes in agile manner.

Second, this study caters the evidence indicative that responsiveness, competency and quickness are increased by firm's willingness to competitive aggressiveness, but in contrast to Chang et al. (2007)'s study, the impact of competitive aggressiveness on flexibility is not supported. Thus, it could be argued that firms with aggressive spirit are likely to have better performance than their own competitors by improving aforementioned capabilities in confronting environmental changes.

Third, this study like the results of studies conducted by Muthusamy et al. (2005) and Clark and Fujimoto (1991) showed that firms with more independency and cross-functional teams can be quicker to complete processes as well as create more flexibility.

Proactiveness is an essential factor to attain management success in that with the creation of prospective view contributes organization to obtain the advantage of being first-mover and to be differentiated from its rivals (Zahra and Covin, 1995). Katayama (1989) affirms that pioneer firms encounter more uncertainty in demand and should be able to adapt themselves with these changes rapidly. Nevertheless, no effect was observed between proactiveness and flexibility in this study but results showed that proactiveness amplify responsiveness capability of firms. Moreover, the results revealed that risk-taking positively affects responsiveness, competency and quickness but it doesn't impact on flexibility. This is in opposition to Chang et al. (2007) studies which identified a positive impact between risk-taking and flexibility.

Eventually, in the wake of the rejection of hypotheses pertained to proactiveness, risk-taking and competitive aggressiveness on flexibility unlike the previous research, it is suggested to investigate the effect of these capabilities on flexibility in other context to clarify this issue. Also, the effect of autonomy on competency is not supported in this research despite the existence of theoretical foundation through the literature that to cast more light on this issue it is worthy to be

studied. In addition, studying the concepts that could moderate the relationship between EO and agility capabilities positively or negatively could be beneficial to illuminate how this association could be fortified or debilitated by other concepts.

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