2010

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Published In

Jiao, Hao, Ilan Alon, and Yu Cui (2010). ?Environmental dynamism, Innovation and dynamic capabilities: the case of China,? Journal of Enterprising Communities: People and Places in the Global Economy (Forthcoming).

Environmental Dynamism, Innovation, and Dynamic Capabilities: The Case of China

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ABSTRACT

Based on the resource-based view, creating and maintaining a long-term competitive advantage requires significant attention to developing and nurturing dynamic capabilities in emerging markets. This study considers environmental dynamism as a moderating variable, then builds a theoretical model for innovation strategy and dynamic capabilities, and finally summarizes the building mechanism for dynamic capabilities. The empirical results find that an innovation strategy can build and upgrade dynamic capabilities in both stable and rapidly changing environments. Managerial implications and future research directions are discussed.

Keywords:

Innovation strategy; dynamic capabilities; environmental dynamism

Introduction

How firms create and sustain a competitive advantage is a fundamental issue in the field of strategic management (Rumelt, Schendel and Teece, 1991). Business firms face rapidly changing environments, whereby the life cycle of technology is continually shortened, product research and development is increasingly accelerated, and competing technologies frequently appear. In a volatile environment, competitive advantage is fleeting rather than sustainable (D'Aveni, 1994). According to the resource-based view of the firm, firms gain and sustain a competitive advantage by deploying valuable resources in order to capture entrepreneurial rents (Wernerfelt, 1984; Barney, 1991).

Therefore, in order to be able to both sense and seize opportunities in the dynamic operating environment, business firms must have the resources and/or ability to reconfigure their existing asset bases and processes (Teece and Pisano, 1994). Managerial and technological capabilities can offer a sustainable competitive advantage to firms in rapidly changing markets only if the firms are able to sense the changes and understand their consequences, and to continuously reconfigure their firm-specific resource bases and processes to fit the environmental requirements (Teece, Pisano and Shuen, 1997). Thus, firms must have the ability to integrate, build, and reconfigure internal and external competencies so as to change their operational capabilities such that they address the rapidly changing environment (Zahra et al., 2006; Teece, 2007). The dynamic capabilities approach to understand a business firm builds upon the basic assumptions of resource-based theory through its assertion that these unique firm capabilities develop over time (Helfat and Peteraf, 2003). Therefore, Leonard-Barton (1992) suggests that dynamic capabilities reflect an

organization's ability to achieve new and innovative forms of competitive advantage given their path dependencies and market positions.

We will examine how to build dynamic capabilities in the rapidly changing environments through the utilization of innovation strategy. Our argumentation builds mainly on the common point between innovation theory and the dynamic capabilities view of the firm. According to Baron and Kenny (1986), such a study will also consider the moderating effect of environmental dynamism on the relationship between innovation strategy and dynamic capabilities. Therefore, we attempt to build a theoretical model that incorporates the moderating effect of environmental dynamism on innovation strategy and dynamic capabilities.

The paper is structured as follows. First, we provide some theoretical background and state our research propositions. We then describe the research methodology, including the sample and the measures. The paper ends with a concluding discussion and implications of the findings.

Literature review and hypotheses

Innovation-based theory

Innovation-based theory, which emphasizes building competitive advantage by capturing Schumpeter rents stemming from fundamental firm-level efficiency advantages, provides a potentially integrative approach to look at the issue at hand (Schumpeter, 1942). Schumpeter (1934) regards innovation as the combination of explicit and implicit production components. In a further step, Schumpeter (1942) identifies and discusses the importance of innovation at a time when most economists were emphasizing static price theory.

In recent research, definitions of innovation can be found in Urabe (1988), Afuah (1998) and Frascati Manual (2002). Urabe (1988, p. 3) suggests that "innovation consists of the generation of a new idea and its implementation into a new product, process or service, leading to the dynamic growth of the national economy and the increase of employment as well as to a creation of pure profit for the innovative business enterprise". Afuah (1998) refers to innovation as new knowledge incorporated in products, processes, and services. The OECD's Frascati Manual (2002) presents a set of R&D activities for technological innovation. In general, we find that innovation can generate and implement ideas to improve capabilities so as to produce value for both organizations and stakeholders.

Dynamic capabilities approach

In the mid-twentieth century, Penrose (1959) raised the growth theory of the firm, which emphasizes the importance of inner resources and inter-organizational learning to match the external environment. With the passage of time, competition between business firms becomes more severe, and business firms are motivated to train and enhance capabilities to integrate, build, and reconfigure internal and external resources and/or competencies to address their changing environments (Teece et al., 1997; Teece, 2007). The concept of dynamic capabilities was introduced by Teece and Pisano (1994) and Teece, Pisano, and Shuen (1997) who asserted that in a dynamic environment a firm's competitive advantage rests on the firm's internal processes and routines that enable it to renew and change its stock of organizational capabilities, thereby allowing it to deliver a constant stream of new and innovative products and services to customers.

As such, these dynamic capabilities emphasize the development of management

capabilities and difficult-to-imitate combinations of organizational, functional, and technological skills to change existing operational mechanisms in order to meet new customer needs and finally to improve performance (Helfat and Peteraf, 2003). Only with deliberate insight into the changes in the environment and with the adoption of changes to update their ability to shape their operating capabilities to adapt to the new environment can business firms survive in dynamic, complex and changing environments.

Innovation strategy and dynamic capabilities

To differentiate the dynamic capabilities approach from other perspectives, recent research on the dynamic capabilities approach is mainly focused on the following areas. 1.) the importance of dynamic capabilities (Collis, 1994; Teece and Pisano, 1994; Zollo and Winter, 1999), 2.) definitions and component factors of dynamic capabilities (Iansiti and Clark, 1994; Luo, 2000; Petroni, 1998; Teece, 2007; Wang and Ahmed, 2007), 3.) the formation mechanism of dynamic capabilities (Ambrosini and Bowman, 2009; King and Tucci, 2002; Lawson and Samson, 2001; Newbert, 2005; Zahra and George, 2002; Zollo and Winter, 2002), 3.) the influence of dynamic capabilities (Griffith and Harvey, 2001; Helfat, 1997), and 4.) the impact of dynamic capabilities on organization (Blyler and Coff, 2003; Caloghirou et al., 2004; Cepeda and Vera, 2007; Deeds et al., 2000; Jantunen et al., 2005; Roy and Roy, 2004; Zott, 2003).

However, as Zahra et al. (2006) have criticized, current research on dynamic capabilities theory lacks empirical tests and does not examine the effects, if any, of innovation on dynamic capabilities. We therefore focus on indentifying the sorts of dynamic capabilities required for the effective development of competitive advantage. We note that innovation theory is playing

an increasingly important role in the strategic management literature (Cohen and Levinthal, 1990; Dougherty and Hardy, 1996). Innovation represents an improvement in capabilities in terms of quality, efficiency, speed, and flexibility, and helps firms play a dominant role in shaping the future of their industries. In addition, dynamic capabilities enhance the ability to adapt to rapidly changing environments. Therefore, innovation strategy in rapidly changing environments has a great impact on the process of construction and development of dynamic capabilities (Lawson and Samson, 2001). Tsoukas and Mylonopoulos (2004) find that knowledge and learning play an important role in the development of dynamic capabilities. This study explores the relationship between a firm's innovation strategy and dynamic capabilities.

Some business firms will employ continuous product and market innovation to achieve competitive advantage, others will adapt management innovations to pursue more benefits, and still others will first sense the changes to achieve first-mover benefits. In industries with relatively mature technology that are highly competitive, for instance the garment industry or and traditional industries such as household appliances, it is only through proactive innovation, the introduction of products that are newer than those of their competitors, or the upgrading of technical specifications, that a competitive advantage will finally be achieved. Furthermore, if business firms are always committed to the development of new products, the transformation of existing products, as well as to an emphasis on product innovation, leading technology, and research and development, then they will likely have competitive attitudes and will engage in the development of new products, new management skills, and technology as the preferred means of competition.

Research has found that continuous product and market innovation can promote improvements in capabilities, giving the firm a competitive advantage. Danneels (2002) examines how product innovation contributes to a renewal of the firm through its dynamic and reciprocal relations with the firm's competencies. Innovation theory is used for a dynamic and path-dependent view of product innovation and firm development, and to reveal the unique nature and challenges of different types of product innovation. Based on evidence from the above innovation theory studies, we offer that:

Hypothesis 1: Innovation strategy will have a positive relationship with dynamic capabilities.

The moderating effect of environmental dynamism

An important topic in the field of strategic management is the issue of how to match a firm's internal resources and capabilities to the external environment (Andrews, 1971). In this process, environmental dynamism is most important contingent variable. The relevant literature indicates that environmental dynamism, typified by rapid change and a state of crisis, affects the relationship between innovation strategy and dynamic capabilities (Pawar and Eastman, 1997; Shamir and Howell, 1999). In differing degrees, the relationship between the innovation strategy and dynamic capabilities may vary.

Generally, environmental dynamism describes the rate and instability of changes in a firm's external environment (Dess and Beard, 1984). Across industries there are significant differences in terms of the impacts of environmental characteristics on firms. Therefore, as environmental dynamism increases, it will be difficult for all involved parties, such as the top management team, stakeholders, and others, to accurately assess both the present and future state of the environment.

In firms within industries exhibiting greater environmental dynamism, such as rapid changes in technologies, markets, and competition, the top managers must make quick strategic decisions and develop creative and innovative strategies to build a rapid response capability to cope with the changing external conditions and thereby to survive and/or prosper in the new environment (D'Aveni, 1994; Hitt et al., 1998). An innovation strategy will increase the effectiveness of communication and planning, and will dynamically enhance the ability to respond. As the environment changes more rapidly, a higher level of dynamic capabilities is required to meet customers' needs (Covin and Slevin, 1989). However, when the external environment is stable, customer preferences are relatively fixed and the increased costs of innovation will not be necessary (Moorman and Miner, 1998).

We believe that innovation strategy has a significant and positive correlation with dynamic capabilities. Innovation strategy will encourage business firms to enhance dynamic capabilities, meaning that if a business firm is always committed to the development of new products, as well as to the transformation of existing products, and emphasizes product innovation, then it will be significantly concerned about the macro-environment and about changes in the industry. At the same time, in the process of product development and technology improvements, business firms will pay more attention to competitors. In sum, such behavior will have a significant positive effect on promoting the enhancement of dynamic capabilities. Thus, we propose that:

Hypothesis 2: The interaction between innovation strategy and environmental dynamism is positively related to dynamic capabilities.

Insert Figure 1 here

Methods

Sample and data collection

This study is a retrospective study, with high-tech and knowledge-intensive business firms as the primary research subjects. In our sample, high-tech and knowledge-intensive business firms accounted for the majority. Firms in the sample are mainly chosen from Yantz River Delta region such as Shanghai and Hangzhou and so on.

According to our design, many of the questions on the questionnaire involve circumstances and details about firm policies and strategies. Therefore, it is necessary that firm executive officers, or at least senior managers (i.e. presidents, vice-presidents, directors, or general managers) complete the questionnaire on their own (Bowman and Ambrosini, 1997; Phillips, 1981). Specifically, the respondent must be either the entrepreneur or a member of the firm's high management team, who is privy to the details and circumstances of firm operations regarding their companies' strategies and overall business situations. An important step in the data collection process is to gain direct access to the firm's original entrepreneur(s) or executive officer(s). This allows us to conduct in-depth interviews to accompany our standard paper survey that provide more basic information regarding the firm and its history. The personal interviews also contribute to improving the reliability of the answers to the survey. Participation in the survey was solicited by means of incentives such as the offer of a summary report of the results.

In order to minimize a social-desirability bias in the measurement of the constructs, in the cover letter it is emphasized that there are no right or wrong answers, and that the responses will remain strictly confidential (Zahra and Covin, 1995). The respondents are asked to recall situations in their respective companies during the most recent three-year period in order to avoid errors of recollection. In fact, we asked the respondents to answer the survey only if

they were the key decision maker in the business firms so that we can get quality data.

We approached 400 high-techs, knowledge-intensive and other kind business firms. We received 158 responses of which 110 were usable. As this is a convenience sample, we seek to understand whether there are biases associated with it. To check for possible response bias, we compared early with late respondents (Armstrong and Overton, 1977). The last 25% to submit their response were considered to be late responses and were deemed to be representative of business firms that did not ultimately respond to the survey. We then conducted a response bias test by comparing the means across all control and dependent variables for the two groups and could not detect any significant differences, as determined by t-tests at the 5% significance level. Therefore, there is no response bias in the study.

Measures

Given the exploratory nature of this study, operationalization and measurement of the construct will be achieved in the following ways: as noted above, because the variables such as innovation strategy and environmental dynamism have been employed in previous studies, the earlier measures were adopted as long as they could provide an acceptable quality of measurement quality, with minor modifications to the wording to increase their applicability to the Chinese case. Special attention was paid to translating the original versions of the measurement scales to capture the linguistic nuances. The scales were first translated into Chinese and then translated back into the original language by another translator in order to verify that the correct meaning of the question was maintained. The measurements were carried out with Likert and semantic-differential scales.

Dependent variable: dynamic capabilities. Our measurement of dynamic capabilities is

consistent with Teece (2007). The CEO or senior managers were asked to freely recall the strategic circumstances during firm operations; then questions based on semantic differential scales were employed to provide additional assessments. The study proposes a set of core components to capture the effectiveness of undertaking the key processes of dynamic capabilities; these include sensing capability, seizing capability and integrative capability. The respondents were asked if the firm's: (1) sensing capability was: slow – fast; (2) seizing capability was: insufficient – sufficient; and (3) integrative capability was: insufficient – sufficient. To assess the validity of the construct and discriminatory validity of the scale, a principal component factor analysis with varimax rotation with Kaiser Normalization was performed on the three items. The factor analysis revealed a single factor with an eigenvalue 2.076 accounting for 69.215 percent of the variance and having factor loadings ranging from 0.791 to 0.861. The reliability of the scale was satisfactory (Cronbach alpha = 0.777).

Independent variable: innovation strategy. The concept of innovation strategy encapsulates firm-level processes, practices, routines, decision-making style (Lumpkin and Dess, 1996), and strategic orientation (Wiklund and Shepherd, 2005). This construct will be measured by a scale adopted from Khandwalla (1977), Miller and Friesen (1982), Covin and Slevin (1989), Naman and Slevin (1993), Wiklund (1999), and Calantone et al. (2002). The degree of innovation strategy refers to the extent to which the business firm actively introduces improvements and innovations, is creative in its methods of operation, and seeks out new ways of doing things. The innovation strategy will be measured by the three items that tap into attitudes toward innovativeness using a 5-point Likert scale. For each of the three items, the respondents were asked to indicate events during the previous three years. The

reliability of this scale was 0.902. Factor analysis showed one factor with loadings greater than 0.90 and an eigenvalue of 2.508. This factor accounted for 83.6 percent of the variance and had loadings ranging from 0.905 to 0.929.

Moderating variable: environmental dynamism. The measurement scale for environmental dynamism, comprising four items, was partly adapted from Dess and Beard (1984), and Garg et al. (2003), originally developed by Miller and Dröge (1986) and Miller and Friesen (1982), and partly from Jaworski and Kohli (1993). For each item, the respondents were asked to indicate the frequency of changes in particular areas, such as (1) the product/service features desired by customers; (2) the product/service features supplied by competitors; (3) product technologies in the industry; (4) government policy in the industry on a five-point Likert scale, with anchors ranging from "Very Frequent Change" (= 5) to "No Change" (= 1). Factor analysis of these four items revealed a single factor with loadings exceeding 0.70. This factor had an eigenvalue of 2.657 and explained 66.424 percent of the variance, confirming the unidimensionality of the scale. The reliability of the scale was satisfactory (Cronbach alpha = 0.831). Loadings on this factor ranged from 0.771 to 0.853.

Control Variables. There are firm-specific and external factors that may affect a firm's dynamic capabilities, regardless of its innovation strategy and environmental dynamism (Teece, 2007). We therefore controlled for age, firm size, ownership, and industry.

Age. The age of the organization was used as a control variable. Specifically, the age of the firm was calculated from the date of inception of operations.

Number of Employees. Firm size is normally operationalized as the number of employees and/or amount of annual sales. It is assumed to negatively affect dynamic capabilities, as a

larger firm has more routines and will be trapped by path dependence. Therefore, senior managers do not like to explore new possibilities to achieve innovation in proactive and risk-taking operations. To avoid problems of multicollinearity in the hypothesis testing, we only used the number of full-time employees as an indicator of the firm size. In order to control for the effects of size on research productivity, the total number of employees in the firm was included in our regressions. This data were gathered from the survey.

Ownership. Since the firms in the survey have different ownerships, we consider ownership as a control variable. In general, state-owned firms have a high level of bureaucracy, and private firms, which are more agile, generate high dynamic capabilities.

Industry. Since the firms participating in the survey came from a variety of industries, it was necessary to control, to some degree, for the different industrial conditions under which the firms operated.

Analytical techniques

We employed a hierarchical regression to test the theoretical model. We applied an item-to-total correlation and used Cronbach's alpha to establish the adequacy of the measurement model. We then performed multiple regressions in SPSS 15.0 software for hypothesis testing (Hair et al., 2006; Nunnally, 1978). The hierarchical regressions added controls, explanatory variables, and joint effect terms incrementally to gauge their relative contributions.

Addressing reliability and common method bias

First, the construct measurements were assessed by calculating the item-to-total correlation coefficients. A coefficient exceeding 0.5 was adopted as an acceptable level of construct measurement. The item-to-total correlation coefficients of all the items all exceeded

0.5, indicating acceptable measurements (Hair et al., 2006). Second, measurement reliability was assessed by calculating Cronbach's alpha coefficient. A coefficient exceeding 0.7 was adopted as the acceptable level of construct measurement (Hair et al., 2006; Nunnally, 1978). Cronbach's alpha of all the constructs revealed that they all exceeded 0.7, indicating acceptable reliability. These results support the unidimensionality of the scales.

Second, due to the collection of all the measures from the same source, this study employed a Harman one-factor test to examine the potential problem of common method variance. One way to eliminate common method variance is, to the extent possible, to prevent it in advance. In this study, we used the method of concealing the personal information about the respondents. Podsakoff and Organ (1986) state that a significant common method variance will result if one general factor accounts for the majority of the covariance in the variables. Therefore, we employed the Harman principal factor analysis to test whether our study has a potential problem of common method variance. We followed Podsakoff and Organ's (1986) suggestion and conducted a principal factor analysis of the questionnaire measurement items without varimax rotation, in which the first factor with eigenvalues greater than 1 accounted for 33.78 percent of the total variance. Since a single factor does not emerge and one general factor does not account for most of the variance, a common method bias is unlikely to be a serious problem in the data.

Analyses and Results

This study attempts to understand the relationships among innovation strategy, environmental dynamism, and dynamic capabilities. Table 1 reports the means, standard deviations, and correlations of all the variables.

According to the criteria of Belsley, Kuh and Welsch (1980), there are no problems of multicollinerarity in any of the regression models (0<VIF (Variance inflation factor) <10 and CI (Condition index) <30). Table 2 displays the results of the ordinary-least-square regression analysis for the effects of innovation strategy on dynamic capabilities, and the moderating effect of environmental dynamism on the relationship between innovation strategy and dynamic capabilities. Model 1 is the base model that includes the control variables, such as age, number of the employees, ownership, and industry. Model 2 includes all the control variables and the independent variable. Model 3 includes all the control variables, the independent variable, and the moderating variable. Model 4 includes all the control variables, the independent variable, and the moderating variable, plus the interactive term.

As depicted in Table 2, Model 2 captures the effects of innovation strategy on dynamic capabilities, which are significant at the $p<0.001$ level ($R^2 = 0.203$). Compared with the base model (Model 1), the explanatory power of Model 2 for dynamic capabilities has increased. The R^2 increased from 0.051 to 0.203. Also, F in Model 2 is 5.301 and significant at the $p<0.001$ level. The coefficient for innovation strategy is positive and significant for dynamic capabilities ($\beta=0.396$, $p \leqslant .001$). Therefore, we can conclude that innovation strategy has a positive effect on dynamic capabilities. These findings support Hypothesis 1 and indicate that in general business firms will achieve a higher degree of dynamic capabilities during a period of firm survival and growth in a rapidly changing environment if they invest more in building up their innovation strategy and give their employees more autonomy to be innovative.

We follow the Sharma, Durand and Gur-Arie (1981) procedure to examine the moderating effect of environmental dynamism on the relationship between innovation strategy and

dynamic capabilities. The study determines whether a significant interaction is present between the hypothesized moderating variable, environmental dynamism, and the predictor variable by the moderating regression analysis procedure. In Model 3, R^2 square is significant. However, Model 4 shows that the interaction term between innovation strategy and environmental dynamism is not significant in predicting dynamic capabilities. Therefore, the empirical results do not support Hypothesis 2. We will discuss plausible theoretical reasons in the following section.

Insert Tables 1 and 2 here

Discussions and Conclusions

This study conducted an empirical verification of the links between innovation strategy and dynamic capabilities, and also examined the role of environmental dynamism on innovation strategy and dynamic capabilities. An innovation strategy is a feasible approach to promote dynamic capabilities. Therefore, innovation strategy is a key driving factor for dynamic capabilities. Business firms can promote dynamic capabilities by adopting an innovation strategy in a dynamic environment. In other words, innovative business firms will promote internal elites to constantly look for necessary resources in business networks. The business elites will then bring back useful information to the organization, and disseminate, reproduce, and institutionalize this knowledge within the firms. Such a process will continue to flow, ultimately generating and promoting dynamic capabilities.

In addition, this study finds that entrepreneurs employ necessary resources through networks as the basis for generation and promotion of dynamic capabilities. In general, as represented by the entrepreneurs, the elites receive resources from networks through learning

mechanisms and they then transfer, disseminate, reproduce, and institutionalize them in the internal organization. At that time, dynamic capabilities will be generated and promoted. That is to say, a sense of the environment will be increased. Updating organizational and technical flexibility is promoted, paving the way for building and promoting dynamic capabilities. The specific strategy is to strengthen the internal driving force for the study of the elite, as well as to cultivate an innovation-oriented performance evaluation system within the business firms.

Finally, we hypothesized that the interaction between innovation strategy and environmental dynamism is significantly and positively related to dynamic capabilities. This is not supported by the empirical results.. Environmental dynamism does not have a moderating effect on the relationship between innovation strategy and dynamic capabilities. We can conclude that innovation strategy will increase dynamic capabilities in both a rapidly changing and a stable environment. In an empirical study of the UK, Oktemgil and Greenley (1997) propose that highly innovative activities are associated with the potential benefits to be gained from being innovative, in both stable and turbulent external environments. In China, Haier's development also illustrates a good example that innovation strategy will increase dynamic capabilities in either a rapidly changing international or a stable local environment. Case in this leading Chinese enterprise has shown that implementing innovation can have positive relations to the value creation/ as well as the accumulation of dynamic capabilities. Therefore, business firms are grounded in the social and economical environments. We should consider the environment as an exogenous predictor, or as an intervening, antecedent, or suppressing variable, but not as a moderator.

In conclusion, we have built a theoretical model using innovation strategy, environmental

dynamism, and dynamic capabilities. Evidence in the literature indicates that an innovation strategy can build dynamic capabilities in rapidly changing environments, but this is done primarily through continuous product and management innovation.

APPENDIX A: SCALES AND ITEMS FOR CONSTRUCTS

Innovation strategy

All items were measured on a five-point scale

The top managers of my firm favor . . .

A strong emphasis on the marketing of tried and true products or services 1 to 5 A strong emphasis on R&D, technological leadership, and innovations

How many new lines of products or services has your firm marketed in the past 5 years?

No new lines of products or services 1 to 5 Very many new lines of products or services

Changes in product or service lines have been mostly of a minor nature 1 to 5 Changes in product or service lines have usually been quite dramatic

Environmental dynamism

Please indicate the frequency of changes in each of the following areas during the past year on a scale ranging from 1 (no change) to 5 (very frequent change):

- The product/service features desired by your customers.
- The product/service features supplied by your competitors.
- The product technologies in the industry.
- The government policy in the industry.

Dynamic capabilities

All items were measured on a five-point scale. The respondents are asked to respond to the firm's: (The left is 1; the right is 5).

(1) sensing capability was: slow – fast;

(2) seizing capability was: insufficient – sufficient

(3) integrative capability was: insufficient – sufficient.

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TABLE 1
Descriptive Statistics and Correlations

Variables	Mean	S.D.	1	2	3	4	5	6
1.Age	3.05	1.017						
2.Number of Employees	3.91	1.223	0.637**					
3.Ownership	2.05	0.994	-0.148	-0.003				
4.Industry	1.55	0.499	-0.086	-0.247**	-0.062			
5.Innovation Strategy	3.106	1.227	-0.028	0.055	0.075	0.093		
6.Dynamic Capabilities	3.815	0.684	0.003	-0.035	0.118	0.151	0.408**	
7.Environmental Dynamism	2.818	0.939	-0.020	-0.001	0.202*	-0.165	-0.087	-0.058

Note: N=110 (two-tailed test).

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

TABLE 2
Results of Regression Analyses

Variables	Dynamic Capabilities			
	Model1	Model2	Model3	Model4
Age	.066	.108	-.100	.100
Number of Employees	-.037	-.098	.149	-.108
Ownership	.169	.142	.108	.139
Industry	.158	.108	.102	.102
Innovation Strategy		.396***	.393***	.181
Environmental Dynamism			-.034	-.210
Innovation Strategy × Environmental Dynamism				.275
F-Value	1.399	5.301***	4.405**	3.856**
R-square	.051	.203	.204	.209
Adjusted R-square	.014	.165	.158	.155
R-square change		.152***	.154***	.159***

Note: N=110

*** Correlation is significant at the 0.001 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

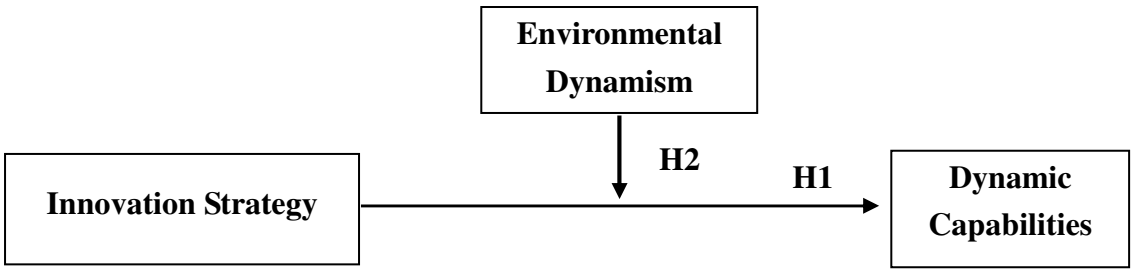

Figure 1: Conceptual model and hypothesized relationships