A STUDY OF THE RELATIONSHIP BETWEEN CORPORATE VENTURING AND HUMAN CAPITAL WITH ABSORPTIVE CAPACITY, INNOVATION AND FINANCIAL PERFORMANCE

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ABSTRACT

How companies can acquire the knowledge required for creation and implication of innovation; what is the most important factor of acquiring this knowledge? And from where the required financial resources – to convert innovations into profit and tangible revenue – can be obtained? This study addresses these questions. Thus the purpose of this study is to investigate the relationship between corporate venturing (CV) and human capital to absorptive capacity (ACAP), innovation and financial performance (FP). This study is among the field research. The population includes large manufacturing firms across Khuzestan Province having been active throughout 2013. The data collection tool was a structured questionnaire and Sampling is convenience method. The research questionnaire was distributed to a sample of 331 R&D and Human resources Experts selected using simple random sampling. The collected data were analyzed using SPSS and LISREL 8.5 statistical programs. The results indicate that there is a significant relationship between corporate venturing with Absorptive capacity and innovation, but there is no significant relationship between corporate venturing with innovation. Also there is a significant relationship between human capital with Absorptive capacity, innovation and financial performance and there is a significant relationship between Absorptive capacity with innovation. Finally, the results indicate that there is a significant relationship between financial performance and innovation.

KEYWORDS: Corporate Venturing, Absorptive Capacity, Human Capital, Innovation And Financial Performance.

INTRODUCTION

Innovation with today’s complex competition environment is considered as a basic advantage for company life. New and heuristic ideas are blown as sole into the body of organization and save it from naught. Companies need to absorb knowledge from external sources in order to innovate. Innovation emersion and knowledge absorption not only allow the organization to obtain competitive advantage, but is a useful tool for organization performance improvement. Innovation is a vital tool that enables organizations to create competitive advantage and
sustain it in today’s highly dynamic environment of ever increasing complexities (Subramaniam, Youndt, 2005). Organizations with more innovative power are more successful on responding to dynamic environments and creating new capabilities which allow them to approach more innovations (Montes et al., 2004). Innovation start point is highly dependent on human resources’ knowledge, professionalism, and commitment which serve as main input for value and innovation creation.

Knowledge is of extreme importance as a main source of innovation and productivity in organization. In recent decades, we have been witnessing significant increase of knowledge and innovation role on economical activities at international levels; because innovation is the most important aspect of new knowledge creation (Collinson, 2000).

Since developed countries need more capital and talents for innovation, the human capital is the key factor for innovative performance; for human capital plays a key role in absorption and adaptation of overflowing technologies through merchandise imports and direct foreign investment flows, and consequently through improvement of innovative technological activities. (Ping, Qingchang, 2008).

As we know, in a knowledge based economy, the economical development and job creation is realized in coordination with innovation capacity; that is, findings through research programs have to continuously change into new products, processes, or systems through investment. In this regard, level of corporate venturing, has received researchers attention. Corporate venturing leads to creation of new jobs and businesses, reduction of economical development; and also increase of investment efficiency rate for companies through using new risks; and causes strategy revival and renewal, improvement of competitive activities, and creation and development of new technologies, distinction, fosters the culture of innovation in the company, and learning through identification and exploration of new risks (Kanter, North, Bernstein & Williamson, 1990). Since the outcomes of innovative activities are uncertain to some extent, Banks and government foundations are not so disposed to invest on them. Thus, entrepreneurs in developed and industrialized countries usually consider the risk accepting investment markets in order to absorb their required capital (Hanifi, 2002).

On the other hand, the competition perspective is changing fast. Important gaps like globalization and deregulation have obscured industrial borders through new business models, technological convergence, and new managerial challenges; And forced managers to new competencies (Prahalad, 1998). Many researchers have argued that most companies do
not have good history of discrete changes management and technology deformation to help them with success in order to achieve long term development and profit making (Prahalad, 1998; Prahalad and Hamel, Christensen, 1997). Even in companies with systematic technology capabilities, serious issues exist in converting discontinuous technological innovations into competitive advantages in modern industries, applications, or the market. An important question is that: How companies can acquire the knowledge required for creation and implication of innovation; what is the most important factor of acquiring this knowledge. And from where the required financial resources – to convert innovations into profit and tangible revenue – can be obtained. This study addresses these questions. For this task, first we present a conceptual framework which helps us understand corporate venturing, knowledge absorption capacity, human capital, innovation and financial performance; then a model is proposed based on related records; and finally, the results obtained from the studied case are reported.

**Literature review**

Porter and Stern (2000) in their study which was conducted using large scale data, found that innovation is an important factor for economic development. They believe that there is a significant relationship between innovation and human capital, particularly in research and development and knowledge store sector.

Vanhaverbeke et al. (2008) in their descriptive article state the advantages of using open innovation (in comparison to inclusive technology) in corporate venturing which can be explained with real options. Open innovation in risky activities like corporate venturing has the advantages of: 1) Profit obtained from participation in new technologies or business opportunities, 2) delay in financial guarantees, and 3) delay in company’s exit from commercial circle due to investment circulation.

Lim (2006) in his research has analyzed the information pertaining 280 companies between 1997 and 2004 which have invested on corporate venturing in South Korea; He concluded that the effect of absorption capacity on performance of corporate venturing investment is significant only when “complementarities” role is existing. This study found two results: first, corporate venturing accepting investment is a mediator through which the knowledge could be conveyed between large and small companies. Second, corporate venturing accepting investment is more effective in middle size investment companies.
Dushnitsky, Gary and Lenox (2002) have proved that risk acceptance influences innovation. They focused on corporate venturing accepting investment such as investment on entrepreneurial companies stocks. In particular, they studied the companies which provide risk accepting investment for companies which learn new technologies and appropriate techniques from their investors. They examined two groups: First, companies currently active in competitive market which intend to introduce new technologies. Second, cases in which the knowledge required for innovation production is existing outside the borders of current company.

Gloet & Terziovski (2004) tried to address the relationship between knowledge and innovation performance. They found that knowledge administration leads to innovation performance when human resources activities and information technology activities are implemented.

Cavusgil et al., (2003) focused on studying tactics of knowledge transfer and companies’ innovation ability. The concluded that tacit knowledge allotment for improving ability of innovation is a necessary measure, and cooperation between organizations plays an important role in tacit knowledge allotment as well and positively affects innovation.

Darroch and Naughton (2001) tried to address the relationship between knowledge administration and types of innovation. They showed that knowledge acquisition and responses to knowledge for innovation is more important than knowledge distribution by far.

Biglari (2010) focused on examining the effects of knowledge administration capabilities on technological innovation process in organizations. He concluded that collecting and implementing knowledge significantly influences innovation, but he did not confirm significant effect of knowledge conversion on innovation.

Rajabi Danalo (2009) studied the relationship between knowledge administration and innovation in organization. He showed that there is a significant correlation between triad of factors knowledge administration, procedures, and innovation.

Ping, and Qingchang (2008) studied the influence of internal and imported R&D and human capital on innovation in China during 1990 to 2005 period. Results of that study suggest that although the effect of international technology propagation on local innovation in this country is not negligible, but bulk of internal R&D serves China as innovation engine;

Alame and Zare (2010) focused on examining the relationship between knowledge administration and innovation among organization employees. They came to this conclusion that there is a direct and significant relationship between knowledge administration and
innovation and both influence directly and indirectly on organizational performance, respectively. They found that an organization would use its resources more efficiently through knowledge administration, and consequently would be innovative and performs better. Results showed that knowledge administration and innovation are directly related to each other, and both influence organizational performance through direct and indirect effects, respectively.

Tseng (2006) examined the relationship between human capital, innovation capital, and organizational performance. This study was conducted covering 50 member companies of Taiwan Stock Exchange during 1998 to 2005. Results of this study showed that the extent of R&D implication significantly influences performance of the companies, and interaction between number of patents (R&D) and level of employees’ salaries significantly influences performance of organization.

Teresa et al. (2012) examined effects of distinct technological qualifications and organizational learning on organizational innovation. They studied effects of all these variables on performance on organization. Results obtained from their analysis based on a sample of 201 technology companies in Spain showed that distinct technological qualifications and organizational learning positively influence performance of the organization directly and indirectly through organizational innovation.

A study conducted by Amiri et al. (2011)” came to examining effect of intellectual capital on organizational innovation that there is a positive and significant relationship between all three dimensions of intellectual capital – human, structural, and relational – and radical and gradual innovation.

Al-Dujaili (2012) conducted an effect of intellectual capital on organizational innovation amongst 32 employees of car making and textile industries in Iraq. He concluded that human capital and structural capital positively and significantly affect organizational innovation, while customer capital does not influence organizational innovation.

Namazi and Ebrahimi (2009) addressed the effect of intellectual capital on current and future financial performance. The results suggest that regardless of company size, debt structure and past financial performance, there is a positive relationship between human capital as a part of intellectual capital, and current and future financial performance of the company both at company and industry levels.
Beigi and Fetres (2009) studied the effect of non-financial variable of human capital on organizational performance of branches of the banks of the country. They found that investing in human capital leads to profuse financial resources for the organization. Bontis, Keow and Richardson (2000) have measured the effects of human capital on performance of two services and non-services sector activities. They found that human capital highly influences performance of both sectors. Chen, Zhu, and Xie (2004) conducted a study on the relationship between human capital and financial performance and market value of the firm. Their study provides a vast understanding of human capital’s role in creating value and the basis of sustainable competitive advantage.

**Theoretical bases**

Corporate Venturing: Narayana et al., 2008 defines corporate venturing as a set of systems, processes, and organizational applications which are focused to create new industries, markets, and fields and are measured using external tools (including patents, ventures, common ownerships, and risk structure of the company) and internal tools (including innovation and new businesses) (Narayanana et al., 2008). This study uses the indices of common ownership, venture investment, and new businesses to measure the Corporate Venturing.

Solivan (2003) defines human capital at firm level as the capabilities of employees for solving customers’ problems, and common experiences, skills, and techniques for all company individuals (Solivan, 2003). Chen and Lin (2006) define human capital as the investment made by organization on valuable and unique talents and technologies which lead to competitive advantage and must be protected against reach of other companies. Pennings, Lee, and Witteloostuijn (1998) emphasis on the company’s ability to provide high quality services and defines human capital as knowledge and skills of its expert employees which can be implemented in order to provide professional services. Firm level human capital is measured through the average value of four dimensions: quantity, appropriateness, complementarities, and uniqueness of organization’s human capital (Rahimi, 1389). These four dimensions almost reflect the gauges of measurement for a competitive advantage source: scarcity, high value, inimitability, and being irreplaceable which are proposed by Barney (1991) through a perspective based on resources.
Quantity of human capital at organizational level shows the amount of human capital available for the organization. The Quantity of Human Capital Index is measured through two components of Knowledge, Skills, Abilities (KSAs) amounts and employee health level via three measures with Likert five-point scale. In fact, this index shows whether an organization has the sufficient amount of human capital and appropriate level of employee health (Rahimi, 2010).

HC-Organization Fit: states the level of alignment between employees’ perspectives and the set of organizational requirements like strategy (Judge & Ferris, 1992), culture, and job positions of the organization. Therefore, this index of human capital fit is measured through three components of human capital fitness with strategy, culture, and job positions inside the organization.

Complementarities among HC, indicates to the systematic effect of human capital which leads to both improvement and maximization of efforts. Complementarities are created when organization is efficient in internal response systems like focusing trained talents, into coordination, job distribution and cooperation and feel united and supported (Porter, 1996). Therefore, the index of complementarities among HC is measured through three components of talents integration, job distribution and coordination, and feeling of unity and support.

Human capital Specificity: is measured through three components of specific talents, level of specificity of knowledge, skills and abilities, and them being un-transferable.

Adaptation capacity (ACAP) of knowledge: is the capacity of company to absorb abilities based on recognizing values of new and external knowledge, absorbing it, and presenting them in order to achieve commercial objectives (Cohen and Liventhal, 1990). Knowledge absorption capacity exists in three levels of personal, group, and organizational. To state knowledge absorption capacity in a comprehensive form this question should be answered that what processes influence each of these levels of knowledge absorption? Having a comprehensive review of related literature, the following factors are considered to answer this question:

At personal level: previous knowledge related to business of organization members.

At group level: trellis and the atmosphere of relations inside the organization.

At organization level: Survey method over environment, expenditures, and R&D methods (Haji Karimi and Hajipour, 2008).
Innovation is a process of translating knowledge into economical development and social improvements which includes a set of scientific, technological, organizational, financial and commercial activities. Innovation emerges through introduction and commercialization of new products or services, or fundamental improvement of existing products and services application; introducing new production process or fundamental improvement in existing processes; opening doors for new market; developing new resource providers such as: raw materials, equipment, and other inputs; and exerting fundamental changes in industrial and organizational structures of the societies. Innovation plays a determinant role for economical growth and development (Puga and Trefler, 2010).

The indices of profit, Return On Sales (ROS), Return On Investment (ROI), and Return Of Assets rate (ROA) are used to measure the financial performance.

**Research Hypotheses**

According to the above hypotheses and research model is mentioned as follows.

Hypothesis 1: There is a significant relationship between corporate venturing and knowledge absorptive capacity.

Hypothesis 2: There is a significant relationship between Human capital and absorptive capacity.

Hypothesis 3: There is a significant relationship between corporate venturing and Innovation.

Hypothesis 4: There is a significant relationship between Absorptive capacity and Innovation.

Hypothesis 5: There is a significant relationship between Human capital and Innovation.

Hypothesis 6: There is a significant relationship between corporate venturing and financial performance.

Hypothesis 7: There is a significant relationship between Absorptive capacity and financial performance.

Hypothesis 8: There is a significant relationship between Human capital and financial performance.

Hypothesis 9: There is a significant relationship between Innovation and Financial performance.
Methods

Data collection

The data were collected using a questionnaire with the following categories:

General Items: inquiring such information as education, gender, age and firm’s activity duration.

Specific Items: including specialized items regarding Corporate venturing and human capital as independent variable and knowledge absorptive capacity, innovation and financial performance, as dependent variables that were measured with a five-point Likert.

The population includes large manufacturing firms which are active during 2013 in Khuzestan Province. convenience sampling was applied to select the sample members. The research questionnaire was distributed among financial managers and financial expert, R&D, and human resources experts. 372 questionnaires were collected among which 41 were discarded and the rest 331 were analyzed.

Among sample firms, 8.2% had an operational history of less than 2 years; 6% had a history of 2-5 years; 14.8% between 5 and 10 years; 15.4% between 10 and 15 years; and 55%, over 15 years.

Among 331 respondents, 282 (85.2%) were male and 49 (14.8) were female. 21.8% had secondary and lower-secondary education; 16.9% had Associate degree; 43.8%, Bachelor degree; 16.3%, Master degree; and 1.2%, PhD degree.
Measures

The testing of factors validity was done by the aid of Confirmatory Factor Analysis by the use of LISREL8.5 software. It is to note that for confirming the measuring model of factor analysis, its indices should be appropriate and secondly the t-value of its standard coefficient should be significant. By LISREL results in table (3) it can be seen that all the 5 measuring models meet the mentioned conditions and are suitable models. These results indicate that the questionnaires of this research have proper validity and reliability. Cronbach's α are CV=0.89, HC=0.899, ACAP=0.884, Innovation=0.895 and F.P=0.881.

Table 1 Measurement model summary.

<table>
<thead>
<tr>
<th>Goodness of fit measures</th>
<th>Criteria</th>
<th>HC</th>
<th>CV</th>
<th>ACAP</th>
<th>Innovation</th>
<th>F.P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-square (w2) of estimated model</td>
<td>-</td>
<td>2.35</td>
<td>5.30</td>
<td>5.11</td>
<td>7.59</td>
<td>4.42</td>
</tr>
<tr>
<td>Chi-square/degree of freedom</td>
<td>≥3</td>
<td>1.175</td>
<td>2.65</td>
<td>2.55</td>
<td>1.51</td>
<td>2.31</td>
</tr>
<tr>
<td>Goodness of fit index (GFI)</td>
<td>≥0.90</td>
<td>0.99</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.97</td>
</tr>
<tr>
<td>Root mean square residual (RMSR)</td>
<td>≥0.10</td>
<td>0.085</td>
<td>0.089</td>
<td>0.086</td>
<td>0.05</td>
<td>0.057</td>
</tr>
<tr>
<td>Normed fit index (NFI)</td>
<td>≥0.90</td>
<td>0.99</td>
<td>0.99</td>
<td>0.97</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>Non-normed fit index (NNFI)</td>
<td>≥0.90</td>
<td>0.95</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
<td>0.98</td>
</tr>
<tr>
<td>Comparative fit index (CFI)</td>
<td>≥0.90</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
<td>0.99</td>
</tr>
<tr>
<td>Adjusted goodness of fit index (AGFI)</td>
<td>≥0.90</td>
<td>0.92</td>
<td>0.93</td>
<td>0.95</td>
<td>0.95</td>
<td>0.93</td>
</tr>
</tbody>
</table>

Results

The present paper is an applied study in terms of purpose. On the other hand, given the data collection manner, this is classified as a descriptive (non-experimental) study which uses a covariance matrix analysis. Such methods include factor analysis and SEM (Sarmad, Bazargan, Hejazi, 2004:90). The SEM technique was used for data analysis and hypothesis testing.

Structural equation models (SEMs), also called simultaneous equation models, are multivariate (i.e., multiequation) regression models. Unlike the more traditional multivariate linear model, however, the response variable in one regression equation in an SEM may appear as a predictor in another equation; indeed, variables in an SEM may influence one-another reciprocally, either directly or through other variables as intermediaries. These structural equations are meant to represent causal relationships among the variables in the model (Fox and S-Plus).

Results implementation of structural equation modeling, goodness of fit statistics model and support or rejection of hypothesis generally are Mention in Table 2.
Table 2 Results of Structural Equation Modeling

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>T-Value</th>
<th>Estimate</th>
<th>Support / Reject</th>
<th>Goodness of fit statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV-ACAP</td>
<td>8/57</td>
<td>0/46</td>
<td>Support</td>
<td>d.f. =133</td>
</tr>
<tr>
<td>HC-ACAP</td>
<td>9/48</td>
<td>0/51</td>
<td>Support</td>
<td>$\chi^2 = 216.52$</td>
</tr>
<tr>
<td>CV-Innovation</td>
<td>5/56</td>
<td>0/56</td>
<td>Support</td>
<td>$\chi^2$/d.f. =1.627</td>
</tr>
<tr>
<td>ACAP-Innovation</td>
<td>1/45</td>
<td>0/16</td>
<td>Not Support</td>
<td>NFI=0.94</td>
</tr>
<tr>
<td>HC-Innovation</td>
<td>2/77</td>
<td>0/21</td>
<td>Support</td>
<td>NNFI=0.97</td>
</tr>
<tr>
<td>CV-F.P</td>
<td>-0/74</td>
<td>-0/05</td>
<td>Not Support</td>
<td>RMR=0.0</td>
</tr>
<tr>
<td>ACAP-F.P</td>
<td>3/71</td>
<td>0/32</td>
<td>Support</td>
<td>AGFI=0.91</td>
</tr>
<tr>
<td>HC-F.P</td>
<td>4/28</td>
<td>0/29</td>
<td>Support</td>
<td>GFI=0.94</td>
</tr>
<tr>
<td>Innovation-F.P</td>
<td>4/44</td>
<td>0/44</td>
<td>Support</td>
<td>CFI=0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>IFI=0.98</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>RMSEA=0.044</td>
</tr>
</tbody>
</table>

Results the implementation of structural equation modelling show that there is significant relationship between Corporate venturing with Absorptive capacity and Innovation but there is no significant relationship between Corporate venturing with Financial performance. Also, there is significant relationship between human capital with the Absorptive Capacity, Innovation and Financial performance. There is significant relationship between innovation and financial performance but there is no significant relationship between Absorptive capacity and innovation. Finally, the results of this study indicate that there is a significant relationship between innovation and financial performance.

Discussion and Conclusions

This study examines the relationship between corporate venturing and human capital – which is capable of absorbing knowledge and innovating – and financial performance. A two-step approach based on structure equation model is used for the task examination and confirmation of analysis determinant factors, to fit the proposed five-factor model, and to measure these variables. Following confirmation of measuring model, the structural model was used in second step to examine the proposed model fit; and proposed hypothesis tests as well. The results obtained from fit of structural equation model, fitness of the proposed model was approved considering study data.

Results of this study have shown a significant relationship between corporate venturing and the capacity of absorbing knowledge and innovation, but there is no significant relationship...
between corporate venture and financial performance. Also there is a significant relationship between human capital at organization level and capacity of knowledge absorption and innovation. A significant relationship was observed between knowledge absorption and financial performance, but again no significant relationship is observed between knowledge absorption capacity and innovation. Finally, results of this study suggest that a significant relationship exists between innovation and financial performance.

Most of the previous studies verified the relationship between knowledge absorption capacity and innovation; but this hypothesis was rejected in this study; Biglari (2010) also rejects a significant effect of knowledge conversion into innovation. We conducted required examinations and tried to find the reason using the sample under question. The most basic reason we found for this hypothesis being rejected, was that innovative projects are judged according to personal relations other than regulations, and they are not carried out based on updated current knowledge of the day.

Also existence of a relationship between corporate venturing and knowledge absorption capacity was not verified here. The reason could be that corporate venturing is often conducted by young and talent engineers who are not equipped with two main factors of success in competitive market: managerial knowledge and experience, and sufficient financial resources. Therefore, much of their efforts to setup new businesses will face failure, thus impeding them from achieving profit and tangible financial resources. It should be noted that economical conditions and business atmospheres are different in different countries. The methods which are favored in developed and industrial countries and lead to profitability possibly do not show required efficiency if used under conditions and business atmospheres in developing and third world countries and may result in main losses as well.

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