

## **Entrepreneurial University, a Necessity for Knowledge-Based Economy; Evaluation and Explanation of Entrepreneurial Capacity of University of Mazandaran**

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**Abstract:** *Entrepreneurship, is an idea and a process in which an individual or group identifies new opportunities and exploits them successfully. Universities as knowledge producing and knowledge distributing institutions play a greater role in industrial innovation. In fact the emergence of entrepreneurial university is a response to the increasing importance of knowledge in national and regional systems of innovation and new perception of the university. The purpose of this study is to explain and investigate the entrepreneurial capacity of University of Mazandaran. From the statistical population of the study 134 specialists and university authorities were chosen as samples, standard questionnaires were used to collect data and data analysis was performed using SPSS and LISREL software. Structural equation modeling results indicated that, generality of the model is approved after correction of fit indices values (RMSEA = 0.056, NFI = 0.91 & GFI = 0.93). The T-student test results revealed that entrepreneurial capacity and its related aspects are inappropriate conditions in the studied university.*

**Keywords:** *Entrepreneurial capacity, University of Mazandaran, Innovation, Higher education.*

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### **Introduction**

Currently, the economy of developed countries, more than anything else, relies on production, distribution and use of knowledge. In these circumstances, higher education institutions as the production and distribution of knowledge institution are not just considered as a center for research and education and it is expected that these institutions have a more active role in production of national and regional economy (Etzkowitz, 2003a). Since knowledge is increasingly considered as an important component of innovation, universities play a greater role in industrial innovation as an institution which produce and distribute knowledge. In the last two decades, Governments around the world have paid attention to this potential of the university as a resource to improve national innovation environment despite the differences between academic and industrial systems (Etzkowitz, Webster, Gebhardt, & Terra, 2000). The transformation from a traditional university to entrepreneurial university will play an important role in the development of knowledge-based global economy (Arnaut, 2010). In fact, the idea of knowledge-based development and developmental programs of the countries, have imposed entrepreneurship mission on the universities. This trend can be seen in developed countries since the late 1980s (Bienkowska & Klofsten, 2012; Etzkowitz, 2003b).

About entrepreneurship, it should be noted that entrepreneurship is a common term; Policy makers, economists, scientific associations and even university students discuss and argue about it. Seminars, conferences and workshops are organized every year around the world on the importance of entrepreneurship in the country, community and individual development. Nowadays, entrepreneurship is seen as one of the best economic development strategies for the development of economic growth and strengthening competitiveness to face with increasing globalization trends.

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Entrepreneurial university is an attractive concept and it represents universities which provide opportunity, culture and beneficial environments to encourage and adopt students and graduates entrepreneurship. Entrepreneurial universities are places where the entrepreneurship is a part of their institutional basis (Gibb, 2005). The traditional role of the university is usually involved in two major activities: Research and Education. Knowledge is transferred by students who have recently entered the labor market, and through publications in scientific journals which allocate considerable period to themselves. Entrepreneurial Universities, redefine the traditional role of the university in community as a producer of knowledge through basic and applied research, technology and the transfer of knowledge, innovation and supporting the economic development (Arnaut, 2010; Bercovitz & Feldman, 2006; Gibb, 2012).

Indeed, the appearance of entrepreneurial university is a response to increasingly importance of knowledge in regional and national innovation system and new recognition of university; as the institution that is the agent of knowledge and technology transfer, and is taken into account as the source of creative inventions, and is economically advantageous. Currently, different plans and programs have been conducted within country to support the development of academic entrepreneurship and research commercialization, but the results of recent studies showed that the status of academic entrepreneurship in Iranian universities is inappropriate, and this issue shows the necessity of deep studies in this field (Samadi Miarkolaei, Samadi Miarkolaei, & Aghajani, 2015).

So far, several studies have been conducted in the context of entrepreneurial universities and most of the researches emphasize undeniable role of entrepreneurial University on Economic, Social and Cultural development of the countries (Agarwal & Shah, 2014; Åstebro, Bazzazian, & Braguinsky, 2012; Audretsch, 2014; Etzkowitz, 2013; Mahdavi Mazdeh, Razavi, Hesamamiri, Zahedi, & Elahi, 2013; Rothaermel, Agung, & Jiang, 2007; Sporn, 2001; Toole & Czarnitzki, 2007; Van Looy et al., 2011; Walsh & Huang, 2014; Wong, Ho, & Singh, 2007; Wood, 2011). According to the importance of entrepreneurial universities and their role in the economic development of communities, the aim of this study is to explain and review the status of the Mazandaran University entrepreneurial capacity and prioritization of entrepreneurial university variables, using Allan Gibb's conceptual model of the entrepreneurial capacity of university (Gibb, 2012).

## **Review of literature**

### ***Entrepreneurship and its importance***

Entrepreneurship includes which cause creation of new economic, social, institutional and cultural environments by the actions of an individual or a group of individuals (Peverelli & Song, 2012). Entrepreneurship is a dynamic process of vision, change and creation. Entrepreneurship requires the use of energy and passion to create and implement new ideas and solutions. The main elements of entrepreneurship are: willing to take calculated risk according to time, equality, or career, the ability to develop an effective venture team, creative skills to arrange the required resources, fundamental skill to build reliable business plan, and finally an insight to identify opportunities which others see them chaotic, contradictory and tangled (Kuratko, 2003, 2004). Schumpeter is one of the most famous scientists of the economy, who has offered remarkable and interesting views about entrepreneurship and entrepreneurs. Schumpeter believed that the entrepreneur is the main propulsion in economic development and his role is to innovate or create new combinations of materials (Casson, 1982). He knew the role of business managers and entrepreneurs so different and he believed that Entrepreneurship means offering new approach of production, finding new markets and new resources or creating any new agencies in the industry and entrepreneur is the one who can convince investors about the desirability of his/her innovation and persuade them to accompany him/her (Palmer, 1971). Entrepreneurship is a multifaceted process; it applies in different organizations and places and it should not solely be viewed from the perspective of profit. Today, the term entrepreneurship is used more in the private sector, while entrepreneurship is defined as a process which the people within the organization pursue opportunities that are independent of the organization's resources, or the employees interact with each other to do new things (Zampetakis & Moustakis, 2010).

### ***Entrepreneurial university, realization process and its characteristics***

University is a social institution that dates back over eight hundred years. This institution in its early stages was just an educational institution for a long time. Etzkowitz (2003b) has stated that based on the internal dynamics of university and the effects of external factors on it two scientific revolution has occurred in the world. The first scientific revolution took place in the late nineteenth century in which universities undertook research mission in addition to the educational mission. Accordingly, groups and research centers formed within the university (Etzkowitz, 2003b). The second scientific revolution occurred in the second half of the twentieth century based on the dependence of innovation on scientific knowledge in which university undertook third mission, in addition to teaching and research mission, which was called economic development. In addition, individual training changed to organizations training and individual study expanded to group study and research groups have been converted into semi-firms (Etzkowitz et al., 2000). Nowadays, universities which undertake third mission and research groups which act as semi-firm are called entrepreneurial universities.

Transformation from a traditional research university to an entrepreneurial university is a common phenomenon and the number of such changes is increasing due to the reduction in funding from government sources and the emergence of competitive markets in education and research. If universities such as the entrepreneurial University do not change to an innovation factor, regional and national development and international competitiveness will be hampered. Over the last ten years, universities have been struggling with diverse issues like globalization and internationalization of higher education, the increasing number of students, financial constraints and the recent economic and financial crises. Today, the main question of universities is how to adapt to continuously changing and dynamic environment? Actual and potential role of universities in economic development has been discussed a lot and in the last decade, much has been written about the concept of entrepreneurial university (Arnaut, 2010).

Based on theoretical considerations about the universities' "Third Mission" and discussion about the nature of University-Technology relation, Guenther and Wagner (2008) argue that "The entrepreneurial university is a varied and diverse institution with direct methods of transferring technology from university to industry and also indirect relationships with industry through education and entrepreneurship." An entrepreneurial university is composed of direct and indirect mechanisms to create links between university and commercial activities (Guenther & Wagner, 2008).

The academic entrepreneurship covers a wide range and different levels, including the university environment, the structure and the utilization of knowledge and technology for the commercialization and it can be examined from different aspects, such as organizational entrepreneurship, corporative entrepreneurship and subsidiaries derived from the university (Etzkowitz, 2003b). An entrepreneurial university is not a university with industrial entrepreneurship activities. According to Etzkowitz and Zhou (2008) entrepreneurial University has its special concept and properties: 1. Entrepreneurship education, to organize training to meet the needs of industry, encouraging students to form developing companies, to tell them how to do it; 2. Advice for the industry; 3. Technology transfer from universities to industry and 4. Subsidiaries derived from the university: creating companies (Etzkowitz & Zhou, 2008).

Today, universities are not just closed research institutions, but also they interact with open system of innovation, firms and government agencies increasingly (Arnaut, 2010). Accordingly an entrepreneurial university is described by a number of key factors:

1. Strong leader who develops entrepreneurial capabilities for all students and staff throughout his/her academic environment;
2. Strong relationship with external stakeholders who provide added value;
3. Providing entrepreneurial achievements that may affect individuals and organizations;
4. Innovative learning techniques that induce entrepreneurial action;
5. Open boundaries which encourage effective knowledge flows among organizations;

6. Multidisciplinary approaches to education that mock the real world experience and focus on the world complex challenges solution; and
7. Stimulation to promote the use of intellectual and entrepreneurial leadership.

Schulte (2004) argues that entrepreneurial university must perform two tasks: 1. Should educate future entrepreneurs to build businesses and develop the entrepreneurial spirit in students and all areas; 2. It should act entrepreneurial itself, it should organize incubators and Businesses, it should create technology parks and places like that, involve students in these organizations and help students and graduates to build their business and ultimately help them to be financially independent (Schulte, 2004).

#### *An example of the entrepreneurial university*

America is the birthplace of entrepreneurial universities. The first derivative organization from the university originated from famous universities like MIT, Stanford and the University of Texas at Austin and they have formed renowned collections such as Silicon Valley and Route 128 (Steffensen, Rogers, & Speakman, 2000). Over the past twenty years, the number of undergraduate students studying at universities has increased greatly and the amount of royalties has been multiplied. Stanford University as an example of these universities, in terms of producing innovations that lead to the formation of new technology-driven firms, is known as a model and sample pattern among entrepreneurial universities and in fact, Stanford Entrepreneurial activities are often considered to be synonymous with the rise of Silicon Valley. Stanford has played an important role in shaping the region's industrial economy.

O'Shea, Chugh, and Allen (2008) in their researches offered MIT University as one of the best samples which can be a model for universities on the way to entrepreneurship. In fact, one of the leading universities, which is pioneer in creating a close relationship with industry and innovation, commercialization and development of research-derived companies (Spin-off), is Massachusetts Institute of Technology (MIT) (O'Shea et al., 2008). MIT's status in terms of knowledge-based firms in the world is an exception. But other universities in the United States have a key role in the creation of knowledge-based companies (Steffensen et al., 2000).

O'Shea, Allen, Chevalier, and Roche (2005) Believe that there are several factors that have caused the success of MIT:

1. Education: In the quality of education and provided training, MIT faculty members have the highest quality;
2. Applied Researches: MIT outstanding research in the field of application, combined with the desire to pursue Trans disciplinary research, is a potent stimulus in production of knowledge which is exploited by subsidiaries derived from university;
3. Universities, government and industry communication networks: In a long period, MIT has developed official domestic and foreign networks between universities, government and industry. These networks increase the financial supply of research at MIT;
4. Licensing Offices and transfer of technology and entrepreneurship programs: MIT has a number of experienced and dedicated organizational structures such as technology licensing offices (TLO), technology transfer offices (TTO) and entrepreneurship programs;
5. University-based companies: MIT has a strong commitment to the utilization of research which promote and support the development of companies which are provided by the scientific community;
6. Culture: Tradition and history of MIT about Fundamental Technology Commercialization (Firms under development) create "Success, produce success" culture among staff and faculty members;
7. Technology Commercialization: Faculty members of the University have positive attitudes toward technology commercialization and development of the company;
8. Financial security: MIT military and Industrial financing security will lead it to innovations towards commercialization.

### ***Background and entrepreneurial university models***

Numerous studies have been conducted to determine the effects of entrepreneurial universities (Bramwell & Wolfe, 2008; Mueller, 2006; Svensson, Klofsten, & Etzkowitz, 2012; Urbano & Guerrero, 2013; Van Looy et al., 2011), But to explain the capacity and characteristics of the entrepreneurial university, models and small dimensions have been proposed by researchers so far (Clark, 1998; Gibb, 2012; Guerrero & Urbano, 2012; Röpke, 2000), For example Keast (1995) identified entrepreneurial activities and organizational structure of the university to promote entrepreneurship researches. Results showed that entrepreneurship and related activities and initiatives, were extremely important for managers and they have had a key role in explaining entrepreneurial capacity. Clark (1998) defines five components of an entrepreneurial university in his research: 1. Strong leadership core; 2. Developmental environment; 3. diversification of the financing; 4. Strong scientific centers; and 5. Integrated entrepreneurial culture (Clark, 1998). Jacob, Lundqvist, and Hellsmark (2003) in his research, stated that important elements needed for innovation include: Flexibility and diversity of the landscape and its implementation at the macro level and flexibility and diversity of the structure and organization of the university in micro-level (Jacob et al., 2003).

Guerrero and Urbano (2012) accomplished a research on "the development of an entrepreneurial university" and they examined the relationship between interrelationships of internal factors (such as human resources, financial, physical, etc.) and environmental factors (such as formal elements like governance entrepreneurial organization and structure etc.). The researchers found that all of the studied universities concentrate and pay attention simultaneously for the subjects of education, research and entrepreneurial missions. The activities related to the knowledge transfer, promoting a culture of entrepreneurship and participation in regional development had the maximum value (Guerrero & Urbano, 2012).

Gibb (2012) has done the most complete and most current researches in the field of exploring and developing the capacity and characteristics of an entrepreneurial university. Gibb has listed main fields of development of an entrepreneurial university in a research, and these fields are our basis to investigate universities entrepreneurial capacity (Gibb, 2012).

### ***Problem formulation and research questions***

In the advanced system of higher education, one of the most striking characteristics of entrepreneurial University is having high entrepreneurial capacity; on the other hand, also one of the prerequisites for the proper entrepreneurial capacity is the existence of a conducive environment for innovation and creative response to environmental needs as an important prerequisite for the realization of the entrepreneurial university pattern and entrepreneurial activity framework, the universities should be prepared to remain in the evolution, to grow and they must be an important place for cooperation of researchers, professors and an important place for research and education. According to the theoretical literature, the provided empirical literature and the research aim which is to explain and investigate the entrepreneurial capacity of the selected universities of Iran, The research questions are stated as:

***First question:*** Are the entrepreneurial capacity of university and their components include: vision, mission and strategy of the university, university governance, structure and organizational design, multidisciplinary Trans disciplinary, leverage, stakeholder management and community values, graduates, knowledge transfer, incubator center, risks financing in all subsidiaries derived from universities, Internationalization and investment entrepreneurial education in selected universities, in a good condition?

***Second question:*** how is the entrepreneurial capacity components ranking in the selected university?

### ***Methodology***

#### ***Data collection technique and sample composition***

The statistical population for the study consisted of 265 of knowledgeable and experienced faculty members in the field of academic entrepreneurship, among these, According to Cochran sampling formula 157 academic professors, professionals and experts were chosen as an example, questionnaires

were distributed among them in a few steps. However, due to limitations in the field studies, 134 questionnaires, suitable for statistical analysis, were collected and their data have been analyzed. Having experiences in university more than 5 years, having managerial positions, related education to management, industry and the commercialization of its' achievements, and finally, the expression of interest to provide their information are the criteria for selection of these experts.

**Measures and its information's**

In this research we have used questionnaire with standardized components to collect data. Questionnaire of this study is composed of the 108 questions of entrepreneurial capacity, which was Offered by Gibb in the year 2012 in the interval Likert scale (5-1), (1 = very poor, 2 = low, 3 = moderate, 4 = high; 5 = very much) and has 11 components as:

1. Vision, mission and strategy of the University;
2. Governance and Management of the University;
3. The structure and organizational design;
4. Multidisciplinary, Trans disciplinary;
5. Leverage and use of diverse resources;
6. Stakeholder Management and values of society;
7. Graduates;
8. Knowledge transfer;
9. Incubator centers, risks financing in the subsidiaries derived from University;
10. Internationalization, and finally;
11. Entrepreneurship education and investment training. In table 1 some information has been presented on the tools used in this study.

**Table (1): Scales used in study**

Scale	Ab...	Subscales	N. items	Example items
<b>Entrepreneurial University (CE)</b>	<i>Q<sub>1</sub></i>	<i>Concept Vision and Mission Strategy</i>	N. items 12	<i>1. Strategic commitment in the university's vision statement to the 'imaginative use of knowledge' and development from research; 2. Strategic commitment to achievement of university status via wide stakeholder credibility.</i>
	<i>Q<sub>2</sub></i>	<i>Governance</i>	N. items 10	<i>1. Understanding of, and support from, the VC/Principal and executive team for the entrepreneurship/enterprise concept; 2. Level of understanding of the relevance of the entrepreneurial agenda by the Council or Board</i>
	<i>Q<sub>3</sub></i>	<i>Organization Design</i>	N. items 5	<i>1. Organization design to facilitate and support bottom-up; 3. Entrepreneurial and innovative behavior; 3. Decentralization in decision making.</i>
	<i>Q<sub>4</sub></i>	<i>Multidiscipline Transdiscipline</i>	N. items 6	<i>1. Numbers of multidisciplinary degrees; 2. Number of departments engaged in vocational/professional development areas.</i>
	<i>Q<sub>5</sub></i>	<i>Leverage</i>	N. items 4	<i>1. Existing ratio of private to fee and public funding; 2. Delegation of revenue raising activity to departments (with Targets).</i>
	<i>Q<sub>6</sub></i>	<i>Public Value and Stakeholder Engagement</i>	N. items 17	<i>1. Focus across the university on areas of societal and cultural concern; 2. Degree to which university assesses its value on the basis of wide legitimacy with stakeholders.</i>
	<i>Q<sub>7</sub></i>	<i>Alumni</i>	N. items 3	<i>1. Strength of Alumni office and its related activity across the university; 2. Active engagement of alumni in the university.</i>
	<i>Q<sub>8</sub></i>	<i>Knowledge Transfer</i>	N. items 3	<i>1. University technology transfer and knowledge exchange activity; 2. Degree to which knowledge transfer and exchange is deeply embedded in departments.</i>
	<i>Q<sub>9</sub></i>	<i>Incubation, Across all Departmental</i>	N. items 16	<i>1. Numbers of patents and licenses and revenues received; 2. University rewards for knowledge transfer</i>

		<i>Spin Offs Venture Funding</i>		<i>performance; 3. Doctoral student exposure to the relevance of their research to the 'real world'.</i>
<i>Q<sub>10</sub></i>		<i>Internationalization</i>	N. items 15	<i>1. Impact of internationalism on the curriculum of the university; 2. International campus initiatives.</i>
<i>Q<sub>11</sub></i>		<i>Enterprise Entrepreneurship Education</i>	N. items 17	<i>1. University personal development contract and related activity with students in general, Capacity for entrepreneurship education beyond the business.</i>

To determine the validity of the questionnaire, it was first put at the disposal of several professors and experts, after obtaining the experts' amendment comments and modification of some of the materials we gave it to a number of members of the statistical population as the primary sample and they also have taken corrective comments we ensured about the relevance of the questions regarding the study population. Then the final questionnaires were used to collect data. We also used SPSS software and Cronbach's alpha test to determine the reliability and validity of the questionnaire. In fact, this method is used in most studies (Cronbach, 1951; Peterson, 1994). Although the minimum acceptable value for this coefficient is 0.7, but 0.6 or even 0.55 are acceptable too (Nunnally, 1978; Van de Ven & Ferry, 1980). However, an alpha level of 0.95 was calculated for the entire questionnaire and for all the components of the studied model, it was obtained more 0.70. This number indicates that the questionnaire has had high reliability.

**Data analysis**

In this method, we have used structural equation modeling, which helps better understanding of the complex social phenomena, to be able to explain and fit the generality of model.

In order to analyze the data various descriptive and inferential methods were used and also SPSS<sub>win 16</sub> software, especially LISREL 8.54 software was used to establish a causal relationship between variables (observer and latent).

**Results**

**Descriptive statistics**

Table 2 shows descriptive statistics for the entrepreneurial capacity of the university and its elements. The results showed that the mean of the variables are in very low levels and universities have a low level of entrepreneurial capacity, The highest and the lowest mean are (*Q<sub>1</sub>*: *M* = 2.27 and *Q<sub>5</sub>*: *M* = 1.82). Cronbach's alpha test results also showed that the components were reliable.

*Table (2): Descriptive Statistics for Scales used in study*

<b>Scales</b>	<b>Cronbach α</b>	<b>M</b>	<b>S.D</b>	<b>MIN</b>	<b>MAX</b>	<b>Skewness</b>	<b>Kurtosis</b>
<i>Q<sub>1</sub></i>	0.81	2.27	0.35	1.58	2.92	-0.31	-1.02
<i>Q<sub>2</sub></i>	0.83	1.87	0.44	1.20	2.70	0.02	-0.93
<i>Q<sub>3</sub></i>	0.71	1.87	0.37	1.20	2.80	-0.26	-0.31
<i>Q<sub>4</sub></i>	0.76	2.35	0.44	1.50	3.50	0.42	0.05
<i>Q<sub>5</sub></i>	0.72	1.82	0.35	1.10	2.75	0.14	-0.18
<i>Q<sub>6</sub></i>	0.79	2.10	0.33	1.47	2.59	-0.66	-1.09
<i>Q<sub>7</sub></i>	0.71	2.05	0.42	1.33	3.00	0.20	-0.56
<i>Q<sub>8</sub></i>	0.72	2.01	0.46	1.33	3.00	0.10	-1.03
<i>Q<sub>9</sub></i>	0.80	1.89	0.39	1.27	2.60	0.07	-1.53
<i>Q<sub>10</sub></i>	0.86	1.94	0.36	1.27	2.60	0.08	-1.46
<i>Q<sub>11</sub></i>	0.84	1.91	0.31	1.29	2.53	0.06	-0.73
<i>CE</i>	0.95	2.01	0.27	1.38	2.54	-0.42	-0.74

**Statistical analysis**

**Structural equation modeling**

We have used the LISREL software in this research to assess causal relationships between variables and fitting the generality research model. In fact, one of the most appropriate analysis methods in behavioral science and social studies is multivariate analysis. This method is a complex combination of mathematics and statistics which wants to use methods like: Factor analysis (a technique for

summarizing data), Multivariate regression and path analysis to analyze a complex phenomenon that is in a form of a complex system.

The structural model, merely explains the causal relationships between variables. The aim of this model is to discover direct and indirect effects of exogenous latent variables on endogenous latent variables. Structural equation modeling is one of complex and advanced statistical methods which has more and better benefits than other statistical methods (Vieira, 2011), Some of these advantages can be summarized as: Simultaneous measurement of several dependent and independent variables which is not available in other statistical methods, measurement pattern evaluation using factor analysis, The exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) and considering the measurement errors. On the other hand, in structural equation modeling, data adaptation and the conceptual model are examined that does the model have a good fit? And also significance of the relationships in this fitted model will be tested. A structural equation model consists of two models as models of measurement and structural models formed (Jöreskog & Sörbom, 1993). Based on measurement models, it can be seen which of the observer variables has the ability to measure latent variable; Based on the structural model, it can be found that to what extent independent variables have causal relationship with the dependent variables. In Figure 1 Structural Equation Modeling of the Research in standard mode and a significant number is provided.

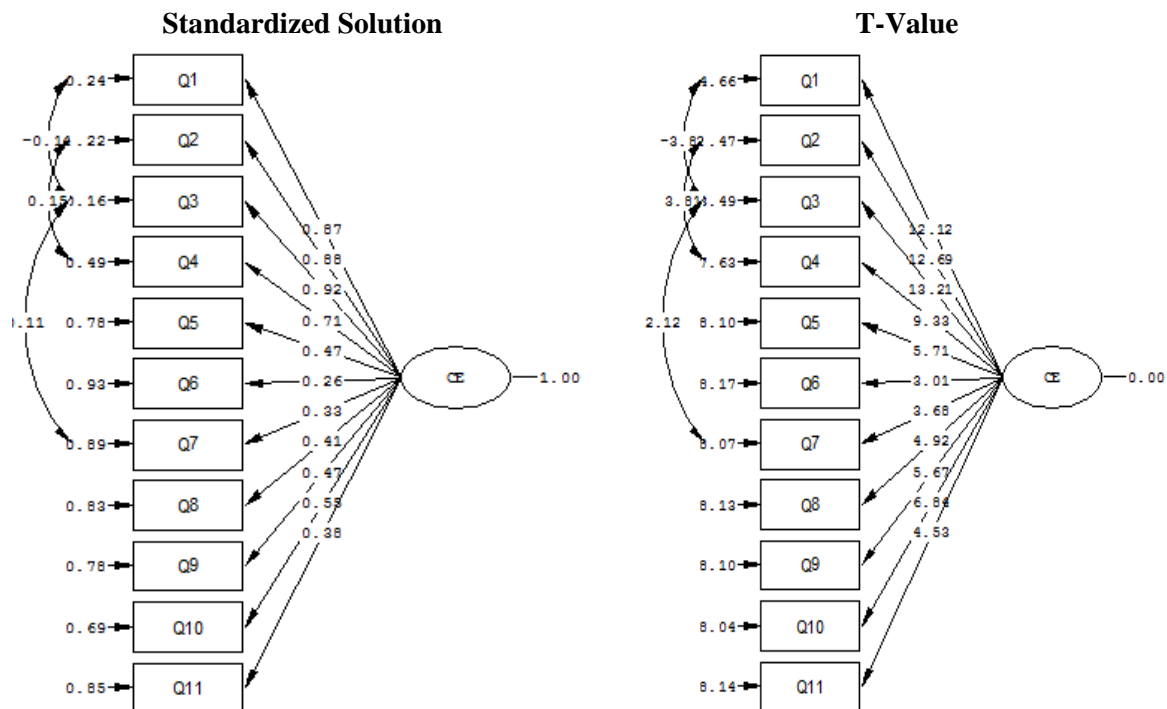


Figure (1): Structural equation modeling results for in Study

Given that there is no agreement on the fitted parameters, to assess the goodness of fit of a pattern, but Chi-square statistic, is widely used as an index of fitness (Ping Jr, 2004). Chi-square statistic test evaluates differences and discrepancies between the model and the given data through testing (Absurd hypothesis which estimates Variance-covariance matrix deviations from sample variance-covariance matrix only because of sampling errors) (Baumgartner & Homburg, 1996; Vieira, 2011). Substantial and meaningful values of chi-square statistic test mean that there is a strong divergence between the data and the model and that the model should be rejected and cannot be accepted. Therefore, as the sample size increases, chi-square goodness of fit statistic test desires to increase and leads to the rejection of the patterns toward small diversion and divergences of data, which limits its utility and practical use. In this concept, it is appropriate to report additional measures and scales of fitness(Bagozzi & Heatherton, 1994). Table 3 summarizes obtained fitness indices and their proper value is also presented.



Table (3): Goodness-of-Fit indices

Fit Index	Cut-offs	Basic model	The modified model
$\chi^2$	-	91.78	58.40
<b>P-value</b>	0.05 < P < 0.1	0.000	0.03
<b>df</b>	df ≥ 0	44	41
$\chi^2/df$	$\chi^2/df < 3$	2.08	1.44
<b>RMSEA</b>	RMSEA ≤ 0.08	0.09	0.056
<b>NNFI</b>	NNFI > 0.9	0.94	0.96
<b>NFI</b>	NFI > 0.9	0.92	0.91
<b>AGFI</b>	AGFI > 0.9	0.83	0.90
<b>GFI</b>	GFI > 0.9	0.89	0.93
<b>CFI</b>	CFI > 0.9	0.96	0.97
<b>IFI</b>	IFI > 0.9	0.96	0.97

It should be noted, as it can be seen in Table 3 for the initial conceptual model research, indices indicate lack of fit of the model. For this purpose, Model was checked and corrected in LISREL software after which the results are as follows: (NFI= 0.91, RMSEA= 0.056, NNFI=0.96, AGFI = 0.90, GFI = 0.93), Therefore, this model has the necessary fitness and its generality has been confirmed because the RMSEA was less than 0.10 and CFI and NFI were higher than 0.90. The values obtained in the above chart show, the conceptual model is a good fit. Given that the model's error square mean (0.056) is smaller than 0.10 and also  $\chi^2/df$  (1.42) is smaller than 3, consequently, model is highly fitted and indicates that based on the theoretical framework, set of variables relations was logical. We have used standardized coefficients and a significant number to evaluate meaningful impact of observer variables on latent variables. About significance of obtained numbers of model it can be said that since the test is done at 0.95 level, Significant numbers won't be between (-1.96) and (1.96) (Bagozzi & Heatherton, 1994; Jöreskog & Sörbom, 1993; Vieira, 2011). This means that if a number is between -1.96 and 1.96, casual relationship won't have any meaning Table 4 shows the significant impact of observer variables on the latent variables. Based on the numbers in Table 4 the impact of research variables can be judged.

Table (4): Path Analysis

Path Correlation	Standardized Solution	T-Value	Correlation
$Q_1 \rightarrow CE$	0.87	12.12	accept
$Q_2 \rightarrow CE$	0.88	12.69	accept
$Q_3 \rightarrow CE$	0.92	13.21	accept
$Q_4 \rightarrow CE$	0.71	9.33	accept
$Q_5 \rightarrow CE$	0.47	5.71	accept
$Q_6 \rightarrow CE$	0.26	3.01	accept
$Q_7 \rightarrow CE$	0.33	3.68	accept
$Q_8 \rightarrow CE$	0.41	4.92	accept
$Q_9 \rightarrow CE$	0.47	5.67	accept
$Q_{10} \rightarrow CE$	0.53	6.84	accept
$Q_{11} \rightarrow CE$	0.38	4.53	accept

Based on the obtained coefficients and values (see Table 4) it can be found that the relationship between the observer variables with latent variables was significant and they have high standard coefficient, it means observer variables influence on latent variables and explain them. EN<sub>3</sub>, or the Organization Design dimension of the university has the highest impact, or in other words the university governance and management can explain entrepreneurial capacity variance better.

**Investigation of the study variables**

In this section, it is aimed to look into the study variables i.e. the capacity of entrepreneurship and the dimensions of the capacity of entrepreneurship in terms of its suitability in society using descriptive statistics (Mean). The purpose is to figure out whether capacity and the dimensions of entrepreneurship can be appropriately investigated or not (see table 5).

As the study benefitted from Likert-scale type of questionnaire ranging from 1 to 5, test value was considered as 3 according to the analysis of one sample T-test.

*Table (5): Investigation of the study variables*

Test Value = 3							
Variable s	T Value	Degree of freedom	Sig. (2- tailed)	Mean difference	95% Confidence interval of the difference		
					Lower	Upper	Accept
<i>Q<sub>1</sub></i>	-23.93	133	0.000	-0.72	-0.66	-0.78	Not accept
<i>Q<sub>2</sub></i>	-29.44	133	0.000	-1.12	-1.05	-1.20	Not accept
<i>Q<sub>3</sub></i>	-34.90	133	0.000	-1.12	-1.06	-1.19	Not accept
<i>Q<sub>4</sub></i>	-16.81	133	0.000	-0.64	-0.57	-0.72	Not accept
<i>Q<sub>5</sub></i>	-38.81	133	0.000	-1.17	-1.11	-1.23	Not accept
<i>Q<sub>6</sub></i>	-31.10	133	0.000	-0.89	-0.83	-0.95	Not accept
<i>Q<sub>7</sub></i>	-25.83	133	0.000	-0.94	-1.87	-1.01	Not accept
<i>Q<sub>8</sub></i>	-24.77	133	0.000	-0.98	-0.90	-1.06	Not accept
<i>Q<sub>9</sub></i>	-32.29	133	0.000	-1.10	-1.03	-1.16	Not accept
<i>Q<sub>10</sub></i>	-33.85	133	0.000	-1.05	-0.98	-1.11	Not accept
<i>Q<sub>11</sub></i>	-40.25	133	0.000	-1.08	-1.03	-1.13	Not accept
<i>CE</i>	-42.18	133	0.000	-0.98	-0.94	-1.03	Not accept

Regarding the results of statistical tests and as depicted in Table 5 it was found that neither the total entrepreneurship capacity of university nor the dimensions of entrepreneurship capacity were in suitable condition. As the T value  $< -1.64$ , and the significance level for all dimensions of entrepreneurship and the total capacity of entrepreneurship are less than 0.005 and confidence level of (95%), it can be concluded that none of the study variables were in their desirable condition.

### Discussion and practical implications

Nowadays, knowledge is one of the important elements in economic development. It should be noted that the future of modern society with dynamic economics is dependent on increasing competition and willingness to growth and inventiveness. In such atmospheres, universities are considered as the most effective institute in a knowledge-based society. In this regard, universities and higher education systems are improving their traditional role and moving toward producing the native knowledge and economic growth and reaching regional and international development, which is in fact a kind of movement toward Entrepreneurial universities that are creating the knowledge and new ideas and change them to practice in its best form. In fact, knowledge-based development and developmental orientation of countries has demanded the role of entrepreneurship to universities. Hence, the presents study aims to investigate the entrepreneurial capacity of the Mazandaran University and rank the dimensions of this capacity. Findings based on LISREL softer reveals that the research model has had the suitable fitting rate and it is totally confirmed. According to the output of SPSS software, it can be concluded that the entrepreneurial capacity of university and the entire studied dimensions in the current research were not in desirable condition.

In fact, the most important finding of the presents study was the explanation and determination of entrepreneurial capacity of the selected universities of Iran and ranking of their entrepreneurial capacity determinants. The existing relationships in the model and the results of structural equations test confirmed the efficiency of the mentioned framework underlying the current study. Identifying the sub factors related to the main index of the model and testing them in the real case condition were another principal findings of the study. Investigating and testing the study variables show that entrepreneurial capacity and its related entire dimensions are in undesirable condition.

In the case of investigation and comparison of the present research with other research, in should be noted that so far no reliable research conducted to investigate the status of entrepreneurial university indices according to this research. The most of these researches only represented a model for entrepreneurial university; Even in Gibb's (2012) study from which present research model adopted,

only one questionnaire designed, but no examination has been done. Therefore, the present research results could not be compared directly with other research, and would not say that the findings are consistent or inconsistent.

As to the findings, it should be noted that the path toward an entrepreneurial university is quite long and challenging. On this road, the first stage is reaching strategic attitude and determining the priorities of university by the help of university suppliers. The second one is the active role of university in commercializing the thoughtful properties of scientific activities done by faculty members, employees, and students. And finally, playing the pre-active role of university in improving the efficiency of innovation in the area by cooperation with industry activists and attracting the government partnership can be effective. Therefore, movement toward university entrepreneurship is the reaction to internal changes that its management seems to be impossible without taking new actions.

Turning to university entrepreneurship not only provides opportunities for universities to reach economic developments, it is also affected by their growing financial needs and the possibility of earning potential income out of entrepreneurial activities such as technology licensing and distributing companies formation. In other words, orientation of universities toward entrepreneurship is influenced by its internal stimulant and social expectations of knowledge-based innovation appearance. The purpose of entrepreneurial activities is to improve the performance of national and regional economics in line with gaining financial interests for teachers and students. On the other hand, some experts and scholars consider the paradigm of entrepreneurship as a threat to the traditionalism of universities, and they are against improving entrepreneurship at universities because financial interests can lead to disregarding the role of university as a critique of the society. As it was noted in the findings section, the main hypothesis of the study was rejected, which reveals that the studied universities of Iran were not entrepreneurs. Therefore, the following suggestions can be applied to improve the situation of university entrepreneurship:

The main section in creating an entrepreneurial university is its internationalization. Some measures in this regard can be: creating an atmosphere of international students' recruitment to the university, innovation in university atmosphere, cooperation faculty members and students with other countries and universities throughout the world, developing language programs to accept foreign students, research and developmental cooperation and providing shared investments with other international universities, and cooperation in international activities.

Organizational structure and design should take the role of facilitator and supporter of innovational and entrepreneurial behaviors in a way to award them, and decision making should be decentralized. Decentralization, informality, being vertical or horizontal, freeing communication from information, group work, flexibility, organizational structure supporting new ideas, easy and informal control, and productive employees are the structural features of entrepreneurial university being able to encourage and develop entrepreneurship. Discussion groups and informal talk among university students and faculty members can also be created to enhance entrepreneurship. As to the graduates, the graduate office of university can take the following measures: creating close and active relationship with graduate students, encouraging research projects and innovations, holding graduation gatherings regularly, holding conferences for and meeting with graduate students and suggesting supporting services to them, training them to improve their job conditions and providing lifetime support for them, establishing an association of entrepreneur graduates, and focusing on discussion groups.

It is the duty of the university to identify the potentials and needs for educational and skills programs of entrepreneurship and investment in all sections of university, and accommodate this purpose in all scientific and educational group to develop entrepreneurship. Education of entrepreneurs and availability of these programs to employees and students, occupational programs, entrepreneurship and self-employment, benefitting from external cooperation for investment and business, promoting the capacity of entrepreneurship training, inclusion of various educational methods in business activities for

university mission and strategy, and totally changing universities to an entrepreneur organization are other actions to be taken in this regard.

An entrepreneurial university should prepare a condition in which information and communication can be clearly and mutually transferred. As it was found that the components of perspective, mission, and university strategy were in undesirable conditions, providing new business activities, application of general income, focusing on existing opportunities of society, thoughtful use of sciences, innovation and entrepreneurship, assisting the development of the location of entrepreneurship, and promoting the role of university missions and its central strategies should be adequately attended. Universities should expand the policy of thoughtful property, permission of technological licensing, and provision of patents to employees and students. It is better for universities to participate students in the process of knowledge transfer and award them based on their activities; to increase derived companies from university and do the necessary supportive activities; to clearly determine the purposes and indices of the performances of the incubator and particularly concentrate on its supportive and consultative services; and to assist in increasing the value, which is the main purpose of science park, by transferring university technology. It is of value to point that one of the obstacles on the road of derived companies from universities is the lack of necessary wealth for investment.

### ***Limitations and Suggestions for Future Research***

There is still a need for more research to be done in terms of entrepreneurial university. In fact, the present study is influenced by some limitations similar to other related studies, that paying attention to these limitation can pave the way to reach better and promising results in the future. As to the findings of the current research, the following suggestions can be applied in future studies:

Application of better and more complete conceptual models; conducting research in other universities especially in industrial universities; doing the similar study but with different methodology and analytical tool; using experimental test and investigating scientific methods of increasing the capacities of university entrepreneurship; changing the managers' attitude toward the formation of appropriate structure to improve the capacities of university entrepreneurship

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