A Study of factors affecting Academic Entrepreneurship in University of Tehran Science and Technology Park

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Abstract:

After the education and research mission, academic entrepreneurship is the new important mission of the university. The concept of academic entrepreneurship correlates with the commercialization of knowledge. The present study seeks to find the factors affecting academic entrepreneurship. The methodology based on the goal is practical, based on the method of obtaining data is descriptive- correlation and based on the collected data that have obtained through questionnaire is quantitative. Population consists of 130 knowledge based firmsin university of Tehran Science and Technology Park that 100 firms were selected by using a stratified random sampling. The validity of research tools' content is approved by six elite professors with academic entrepreneurship and the reliability of the variables are calculated by Cranach's alpha that institutional trust and external factors are 72% and 66% respectively. The research results suggested that there is meaningful relationship between external factors and academic entrepreneurship and also there is not meaningful relationship between institutional trust and academic entrepreneurship.

Keywords: Institutional Trust, External Factors, Academic Entrepreneurship, university of Tehran Science and Technology Park

1. Introduction

The emergence of new economy in 1990s has changed the relationship between science, technology, innovation and economic performance so that in learning and knowledge based economies such interactions between different functions in innovation process is necessary for producing, stockpiling and distributing knowledge in order to enhance the competitiveness through technological based changes and innovations (Engel 2004). Hence, universities as the major institutions that produce knowledge, due to the change in the nature of knowledge production and economic production, have a new role in economic and regional development (Etzkowitz & Leydesdorff 2000). A Science and Technology Park is a specialized and professional institution works for promoting innovation culture level and enhancing the interface between the present firms in the park and industrial and commercial centers and institutions that produce knowledge (Radfar 2007). The Science and Technology Parks are as the bridge between university and industry and are the best place for technological development and growth.

The problem is that inefficiency and lack of skills and rules in university and Science and Technology Park are obvious and the strategy for its using is academic entrepreneurship. Because efficiency and effectiveness of knowledge based firms established in Science and Technology Park can be its best factor. This study examined the effective factors on academic entrepreneurship in university of Tehran Science and technology Park, but because it requires to some changes in organizational structure in university of Tehran, academic entrepreneurship is the solution.

2. Literature review

Entrepreneurship definitions covers the wide range of activities and processes that include innovation and establishing an organization, creating new vision, identifying opportunities, and risk appetite. Therefore entrepreneurship can be considered as a process of increasing wealth through innovation and identifying opportunities (Hani et al 2011). Over the recent decades the phenomenon of entrepreneurial universities has attracted much attention (Van looy et al). O'shea et al (2014) have expressed academic entrepreneurship as the efforts and activities of universities and their industrial partners in order to commercialize the results of investigations in faculties. Academic entrepreneurship does not involve an event but it is a continuous process consists of a series of events (Friedman & Silberman 2003). Academic entrepreneurship is identified as a commercial development beyond the traditional focus on granting intellectual properties and it includes the act of creating generative firmsfrom technology and produced knowledge in universities (Wright et al 2007).

Trust is considered as an inter-organizational factor affecting academic entrepreneurship. Fukuyama uses trust as an index for expressing of social capital in terms of the collective values of social networks. Islander also defines the generalized trust as the idea of social capital that is linked with common values, personal interests, and forming the basis for collective actions. According to Almon & Verba trust each other is prerequisite for forming secondary relationships. The definition of trust that is mentioned here is applied as a whole in organizations. Also, institutional trust refers to the expectations a person has that organization will act in

ways that is predicted and will fulfill his expectations with generosity toward him (Gearey 2011). This study addressed the issue of whether academic entrepreneurship affects the institutional trust or not?

On the other hand, the theoretical principles and literature show that external factors that affect visions, values, performance, and university behavioral style and their stakeholders and predict success or lack of success of universities in commercializing the results of investigations can be presented and reviewed as follow:

1) Governmental forces
2) Economic and market farces
3) Customers and customer orientation
4) Competitors and competitiveness
5) Technological advances
6) Venture capital funds
7) Information and communication technology (Feldman 2007)

In the present study, three components are the base of examination that are more close to academic entrepreneurship and effect on behaviors, values and visions of universities, they are: governmental forces, competitors and competitiveness and technological advances. The governmental forces mean the government encourages the commercialization and innovation process by providing substructures such as legal and public institutions (Study group of strategic management faculty 2008). Competitors and competitiveness mean that competitors or competitiveness have to consider university as a center and factor for economic growth (Ghelichi 2006). Technological advances also refer to the production of new knowledge and commercialization. The effect of the global knowledge- based economy on many big universities around the world has made academic education as one of the largest capital sources of university for producing income (Feldman 2007).

Historical context

In this section by looking at some examples of researches on academic entrepreneurship, various levels of analysis and various methods of research, their results and experiences has been used and also lack of skills, rules, and values is examined in the Tehran university and university of Tehran science and technology park. In the study on "examination of the role of entrepreneurial organization structure and its function" by Dr. Beigi and Dr. Afghahi, research and development is considered as one of the fundamental issues of technology management that requires the existence of entrepreneurship in the creation and exploitation of new knowledge to meet the technical needs of beneficiaries of technology and ultimately creating value (markman, sigloo, wright 2008).

According to Chugh (2004), office of technology transfer (growth centre) plays a key role in creating academic entrepreneurship and this is done through engineering synergistic among scholars and venture investors, consultants and managers and offering the expertise in company formation (such as: the staff of technology transfer who has the expertise in market assessment, writing a business plan, raise funds, relationship between teams and providing space and equipments). Some scholars have found that the extent of support, quantity, and the experience of office of technology transfer have meaningful and positive relationship with increasing the firm's derivative activities (Locket et al 2005, Powers & McDougall 2005). Oshea et al (2004) have been integrated the process approach in the form of a conceptual model that includes: factors, elements and consequences of academic entrepreneurship (academic firm's derivation) that in this context conceptual integration of the present elements can be seen. This context suggested that four factors: individual characteristics, organizational characteristics, cultural and institutional factors, and external environment affecting the rate of firm's derivative activities.

Wang et al (2007) in a paper entitled 'entrepreneurial university model to support knowledge-based economic development: The case of the National University of Singapore' have referred to the role of this university in encouraging economic growth through the researches related to industry, technology commercialization, establishing breakaway firmswith advanced technology, and penetrating entrepreneurial mindset among graduates. In Shane's research the environmental factors affecting the level of activities of university's breakaway firmswere examined. These factors include wealth creation, accessing to capital, locus of property right, flexibility of academic markets, flexibility of academic markets, and industrial combination of geographical region.

3. Conceptual model

As it was discussed in literature review, there are various inter- organizational factors and external factors influencing academic entrepreneurship that in present study, institutional trust is considered as an inter-organizational factor and governmental forces, competitors and competitiveness, and technological advances are considered as external factors and based on

these the theoretical framework and hypothesis of this study are formed:

1) Is there any meaningful relationship between institutional trust as inter- organizational factor and academic entrepreneurship?

2) Is there any meaningful relationship between governmental forces, competitors, and technological advances as external factors with academic entrepreneurship? Figure 1: conceptual model

4. Methodology

The present study is descriptive and correlational, and the questionnaire is used for collecting data. The study population included 130 knowledge based company in university of Tehran science and Technology Park that 100 firmswere randomly selected by using stratified random sampling. The data collecting tools in this research are the questionnaire that is made by researcher and its questions were related to the title of study and also are a derivative from academic entrepreneurship questionnaire by Dr. Moghimi. The validity of research tools' content is confirmed by six elite professors who have training records related to academic entrepreneurship. These questionnaires were distributed and then were gathered by the companies' managers in science and technology park, because they are experienced people and there is good relationship between them and park's managers. In this part of study at first Pearson correlation test is used for the effecting factors on academic entrepreneurship in university of Tehran science and technology park and the effect of inter-organizational factors and external factors on academic entrepreneurship in university of Tehran science and technology park. Then regression is used to examine the relationship between each independent variable dimensions (inter-organizational factors and external factors) on dependant variable (academic entrepreneurship) and its value.

The content validity of a test is determined by those who are specialized in the subject under study. The content validity is confirmed by specialized people and the indices reliability is as follow:Table1: the indices reliability

5. Results

Researchers, in the descriptive analysis, summarized and categorized the demographic data for research through descriptive statistic indices, in this part of statistic analysis distribution of statistical samples with respect to variables such as sex, age, education, and experience related to respondents is examined. According to the total number of 79 participants who responded to the questionnaire, the distributions of respondents in terms of sex were 49 male and 30 female. 69% of participants were male and 38% were female. According to the total number of 79, the frequency and percentage distribution of participants by age are as follow: 60.7% between 20 – 30 years old, 27/9% between 31- 40 years old, 10/2% between 41- 50 years old, and 1/2 % between 5-60 years old. According to the total number of 79, the frequency and percentage distribution by degrees are as follow, 1%diploma, 37% bachelor, 37% master, and 3% Ph.d.

5.1 Examination of inferential statistics variables of research

For examining the relationship between institutional trust and external factors on academic entrepreneurship in university of Tehran Science and Technology Park, Pearson correlation coefficient test and regression is used. Pearson test made it possible to examine the hypothesis significance by considering the significance level ($a<0.05$) or ($a<0.01$). Table2: describing variables

First hypothesis: there is meaningful and positive relationship between inter organizational factor and academic entrepreneurship.

Secondary hypothesis:

H0 = there is not any meaningful and positive relationship between institutional trust as inter organizational factor and academic entrepreneurship.

H1= there is a meaningful relationship between institutional trust as inter organizational factor and academic entrepreneurship.

Table3 presented mean, standard deviation, and the number of responses, and table 4 presented Pearson correlation for the first hypothesis. Before examining institutional trust and external factor relationship on academic entrepreneurship investigate the meaningful relationship between them (Pearson correlation coefficient). According to spss output in table 4, Pearson correlation coefficient between two variables is 0. 218. Significance level is0.54 that is higher than standard level (0.05). Hence, there is not any meaningful relationship between institutional trust and academic entrepreneurship. The calculated beta value is 0.06 and because it's lower than standard value (0.15)

shows that the relationship between institutional trust and academic entrepreneurship is zero. Table 3: The mean, standard deviation, and the number of responses of institutional trust and academic entrepreneurship

Table 4: Pearson correlation test for the first hypothesis

Second hypothesis: there is meaningful and positive relationship between external factors and academic entrepreneurship.

Secondary hypothesis:

H0= there is not any meaningful relationship between academic entrepreneurship and external factors such as: competitors, governmental forces and technological advances.

H1= there is meaningful relationship between academic entrepreneurship and external factors such as: governmental forces, competitors, and technological advances.

Table5 presented mean, standard deviation, and the numbers of responses, and table 6 presented Pearson correlation test for second hypothesis. According to spss output in table 6, Pearson correlation coefficient between two variables is 0.489, the significance level is 0.00 that is lower than the standard value. Thus in confidence level there is meaningful relationship between two variables.

Table5: the mean, standard deviation, and the number of responses of external factors and academic entrepreneurship.

Table 6: Pearson correlation test for the second hypothesis

Suppose there is relationship in H1.

As it was seen in table 4, the significance level of institutional trust is higher than 0.05 suggested that there is not any linear relationship between independent variable (institutional trust) and dependant variable (academic entrepreneurship). Beta value is 0.66 and showed that institutional trust 6% affects academic entrepreneurship, because this value is lower than the standard value (0.15), the effect of institutional trust on academic entrepreneurship is considered as zero.

As it can be seen in table 6, the significance level for external factor variable is lower than 0.05 and suggested that there is a linear relationship between the independent variable (external factors) and dependant variable (academic entrepreneurship), beta value is 0.46 and showed that the amount of academic entrepreneurship affecting

by institutional trust and external factors is 46%, and because this value is higher than the standard value (0.15) is acceptable.

Table 7: regression test for the research hypothesis

Variables: institutional factors- external factors

Beta value, significance level, R square- F

In addition table 7 showed the regression test between variables, R value is 0.24 and indicates that the amount of explanation of academic entrepreneurship by institutional trust and external factors is 24%. F value showed that there is meaningful relationship between at least one of the independent variables (institutional trust and external factors) and the dependant variable (academic entrepreneurship). The significance level suggested that there is meaningful relationship between external factors and academic entrepreneurship and there is not any relationship between institutional trust factors and academic entrepreneurship.

According to the obtained results, research performance model is approved as follow: Figure 2: conceptual model

6. Conclusion and recommendations

The purpose of present study was to indentify affecting factors on academic entrepreneurship in university of Tehran science and Technology Park. The significance level here suggested that there is meaningful relationship between external factors and academic entrepreneurship and there is not any relationship between institutional factors and academic entrepreneurship. Ztvkma unlike Giddens believed that trust can exist only among humans and this possibility does not exist among natural phenomena and if extended these issues to trust, in fact we trust to human creations and we trust indirectly to designers, manufacturers, and those who are specialized in these areas. Lack of good relationship among the companies' mangers and park officials and also mangers were not satisfied with the performance and offering facilities to the firmsin Science and Technology Park resulted in the rejection of institutional trust, here it was found that firms' managers do not trust park officials and it caused the rejection of the first hypothesis.

Theories of institutional trust connect trust to the whole country and also social cohesion and legitimacy by trust to a particular institution. In this study, this hypothesis was rejected and based on the results of the present study in the second hypothesis; having advanced technologies provides fields for doing researches based on technology and creating new technologies, and these technologies are the industrial customer's requirements and interests. The results of previous researchers (Sharifzadeh et al 1388; Shane 2004 &Chugh 2004) also approved positive affect of external factors (governmental farce, competitors and competitiveness, and technological advances)

on academic entrepreneurship and commercialization the results of the present

hypothesis is the same. According to the results, there is not meaningful relationship between institutional trust and academic entrepreneurship but there is meaningful relationship between external factors and academic entrepreneurship.

Hence, according to the results the following practical recommendations are suggested:

1. Investigating the other variables effecting academic entrepreneurship
2. Investigating in the coming years for comparing their results with this research
3. Investigating about research's dimension and its relationship with academic entrepreneurship
4. Investigating about affecting factors on academic entrepreneurship in other universities.

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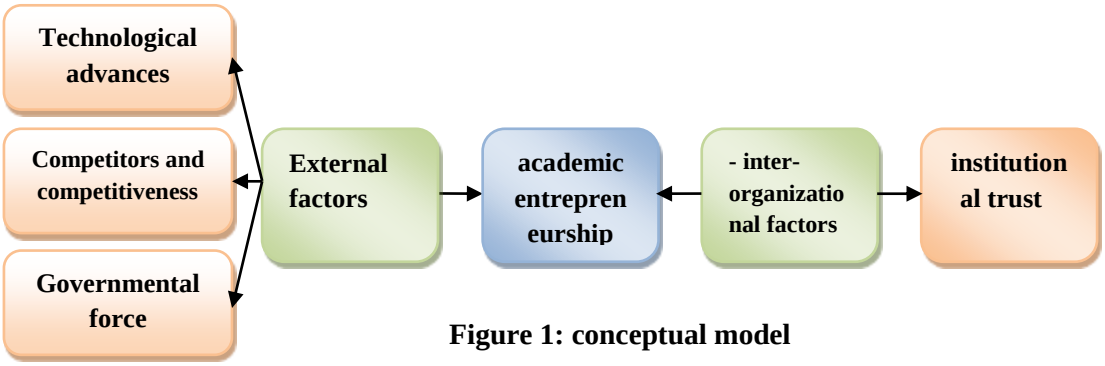

Figure 1: conceptual model

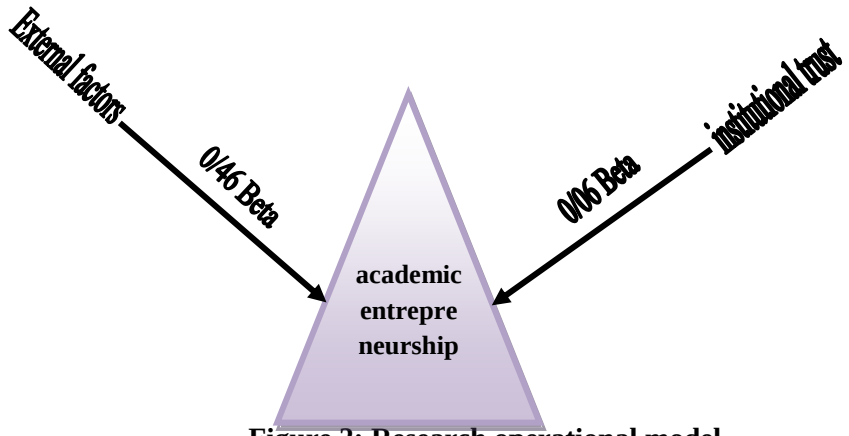

Figure 2: Research operational model

Table1: the indices reliability

cronbach's alpha	Number of items	Variable
0.726	7	institutional trust
0.664	9	External factors

Table2: describing variables

standard deviation	mean	range of variation	maximum	minimum	number of items	Variable
5.16	22.18	23.2	36.4	13.2	10	academic entrepreneurship
3.01	13.13	20.57	26.71	6.14	7	institutional trust
4	18.08	22	30.11	8.11	9	External factors

Table 3: The mean, standard deviation, and the number of responses of institutional trust and academic entrepreneurship

the number of responses	standard deviation	mean	Variables
79	3.01	13.13	institutional trust
79	5.16	22.18	academic entrepreneurship

Table 4: Pearson correlation test for the first hypothesis

result	the number of responses	Sig nificance level	Correlation	Variables
There is no rejection of the hypothesis H1	79	0.053	0.218	institutional trust and academic entrepreneurship

Table5: the mean, standard deviation, and the number of responses of external factors and academic Entrepreneurship

the number of responses	standard deviation	mean	Variables
79	4	18.08	External factors
79	5.16	22.18	academic entrepreneurship

Table 6: Pearson correlation test for the second hypothesis

result	the number of responses	Sig nificance level	Correlation	Variables
Suppose there is relationship in H1	79	0.00	0.489	external factors and academic entrepreneurship

Table 7: regression test for the research hypothesis

F	R square	Sig nificance level	Beta value	Variables
12.15	0.24	0.54.	0.06	institutional trust
		0.00	.046	External factors