

IDENTIFICATION OF THE FACTORS THAT AFFECT IN CHOOSING THE UNIVERSITY RESEARCH COMMERCIALIZATION STRATEGIES

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ABSTRACT

One of the most important goals of science and technology policy makers is how universities can differently effect on the new product development processes and having successful commercial outcomes for creating value. In the current competitive world, the university research commercialization process is remembered as one of the important factor in the technological innovation process and effective factors in development of knowledge economy. Appropriate choice of university commercialization strategy has a large impact on the successful university researches commercialization. Identification of the Factors that affect in choosing the university research commercialization strategies is the most efficient part of university research commercialization process. The effective Factors of university research commercialization strategies are identified in this article. Research method of this paper is mixed method. Using the snowball method for qualitative part, deep interview was done by experienced university managers, teachers and science and technology policy makers. The interviews continued up to theoretical saturation and quantitative questionnaires were distributed among the experts. The results was shown that the effective factors select the university research commercialization strategies consist of organizational, environmental, personal and institutional, and technological factors.

Keywords: *choosing to commercialization strategy, institutional factors, technology factors, university research commercialization*

1. INTRODUCTION

Nowadays countries all over the world try their most to provide society with welfare and security to increase in national income to promote national and international economic growth. The super powers follow economic, political, cultural, defense and security goals in order to obtain superior technology and increase their competitive ability. To achieve superior technology for create wealth and improve productivity and national efficiency is life's essential strategy in current age for any country. Many authors claim that universities have new role to commercialize research results. As far as the importance of science-based innovations in development of Industrial Organizations is increasing more and more universities can play more roles (Rasmussen, 2004). To maximize efficiency in an organization through technological innovation, commercialization strategy should include the utilization of specific types of opportunities that arise from those environments. Of the few studies that have been performed in this field; is the case study done by O'shea and Umam. The question posed in this research is: What are the Factors that affect in choosing the university research commercialization strategies?

2. RESEARCH LITERATURE REVIEW

Commercialization strategies

Research commercialization is a process in which, using all possible opportunities all circumstances to get profit from investment in technological innovation be prepared (Dilcher, 2002). The simplest definition of commercialization is offering a new product to the market (Diane,2004). Major part of the existing literature in university research commercialization strategies point to the role to register university patents and assign license to them. Such researcher as (Siegel ,2004), (Bercovitz and Feldman,2004),(Jensen and Thursby,2001),(Henderson,1998) have paid attention to the registration of patents and licenses in Results of the university research commercialization. Also other researchers have pointed to the role and significance establishing calving companies in university research commercialization. Some researchers (Shane, 2004), (Di Gregorio and Shane, 2003), (O'Shea, 2007) have paid attention to the importance of establishing calving companies in university research commercialization. In a number of studies (Vohora, 2004), (Stuart, 2003) and (Cohen, 1998)the importance of joint and bespoke research and university professors consultation to industrial sector have emphasized. Certain research commercialization strategies are divided into two categories, formal and informal. Formal commercialization strategies include university patents licensing to existing companies, Forming Startup companies or reproductive

Companies and informal strategies include such strategies as giving consult to Industrial Company by university professors. To continue umam reviews the literature and try to evaluate the factors in choosing the commercialization strategies and finally by Benchmarking the O'shea's work provides a model in Identification of the Factors that affect in choosing the university research commercialization strategies. Umam divides those factors in four categories: organizational, environmental, personal and institutional, figure (1) shows Identification of the Factors that affect in choosing the university research commercialization strategies (Umam, 2008). According to this model, environmental the Factors that affect in choosing the commercialization strategies forming reproductive Companies consist of the existence of venture investors, infrastructures, laws relating university intellectual property and industry characteristics. Institutional factors consist of leadership, goals and mission, history and tradition, university culture and policies and rewards. Organizational Factors include researcher's expertise, the existence interdisciplinary research centers, study Nature, Resource and technology transfer professionals, technology transfer process, Major commercial orientation, the type of technology developed, Entrepreneurship education programs and the existence of university Growth centers. Personal Factors also consist of motivation, Job experience and researcher networks that all are effective in involving of University with researcher in choosing university strategies. Umam reviewing literature in the field of university research commercialization Refers to Several mechanisms or strategies in relation to university research commercialization as Transfer license to university patents, establishing calving companies, joint and bespoke research with industrial sector, consulting university professors to industrial sector an disusing the results of scientific research in Journals. Umam stated that Differences in motivation and cultural resources and other relative features have caused the Three parties involved in commercialization process ie, the researchers, university and industry to Adopt different ways and strategies in relation to university research commercialization.

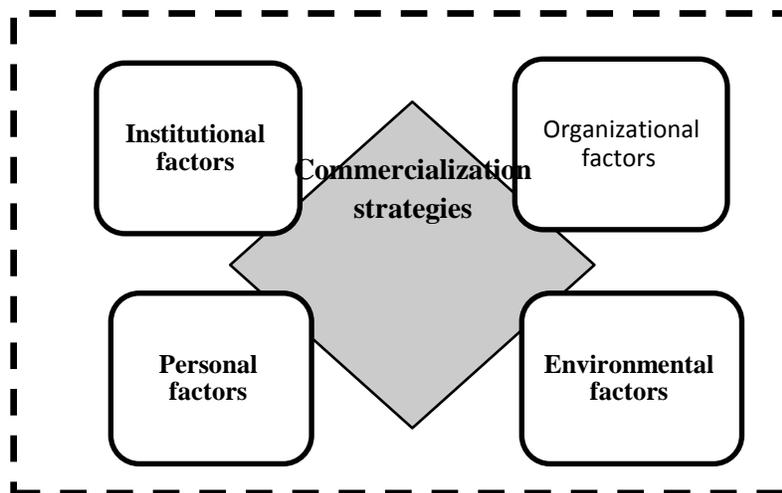


Figure 1the factors that affect in choosing the university research commercialization strategies (Umam, 2008)

One of the factors that can lead researchers and universities to choose commercialization strategy, exist of supportive structures such as incubators and science and technology parks (DiGregorio and Shane, 2003).Existence of important structures such as incubators explains the university emphasis on establishing calving companies as a commercialization strategy (O'Shea et al, 2005).Institutional Factors are politics, Laws, contracts, values, behavioral norms, culture in a certain community (North, 1990). Effective Institutional Factors in establishing university calving companies include factors like Reward system, University Culture, Organizational structure, Policies related to intellectual property (Moray, 2002). Entrepreneurship culture at the University is necessary to participate researchers in commercialization activities(Rasmussen,2006). The number of companies in industry is of Effective factors in commercialization strategy. In industries where the number of competitors is low, usage of license strategy to Existing Company has increased, In contrast, when the number of competitors is more, the strategy of establish university calving companies is used (Shane ,2004). This article is investigating Identification of the Factors that affect in choosing the university research commercialization strategies.

3. RESEARCH METHODOLOGY

The process in this study has two parts. In the first part for Identification important strategies Used in university research commercialization strategies, Quantitative questionnaire was distributed among academic experts aware in

commercialization strategies. the strategies of transfer license to university patents, establishing calving companies and joint and bespoke research with industrial sector were identified as most important in university research commercialization strategies. In the second stage mixed methods have been used (qualitative - quantitative) for identification of the Factors that affect in choosing the university research commercialization strategies. Determining sample size Methods in interview based on Snowball sampling to saturation point and Logic Adequacy Collected data have been raised as Limit data Completeness. In this regard, interviews has been done with ten managers and university professors Informed in new product commercialization strategy and after the tenth interview, researcher concluded the Interviewers data have got repetitive aspect and have reached to Saturation point, therefore there is no need to continue interviews. Then using Dimensional- inductive coding method, codes have been obtained for each of the questions answered. A questionnaire has been prepared out of the results of coding in qualitative part and Identification Major and minor factors and sent to 120 Iranian informed experts and managers in university research commercialization. After determining the importance of each of the identified factors in choosing the commercialization strategy, we compare the effect of each of the identified factors in three desired commercialization strategies the Transfer license to university patents, establishing calving companies and bespoke research with industrial sector.

4. RESULTS (QUALITATIVE PART)

The table below shows results of qualitative part and accuracy of results with research recourses.

Table1. Qualitative part result and Compared to other Researchers.

Compared to other Researchers	Major factors	Pivotal factors
Lopez, Gonzales ,Sandias(2007) Link,Scott(2007) O'Shea, Allen, Chevalier, & Roche, Vinig(2004)	Organizational resources Organizational management Organizational structure Organizational process Knowledge Management in Organization	Organizational factors
Shane(2004) (Christensen and Bower,1996) Shane,Katila (2002) Bostjan Antoncic (2001)	financial markets Infrastructure Labor market Industry characteristics government	Environmental factors
Markman(2006) Ternatzky (1995) Arrow (2006)	technology level Intellectual property	technological factors
Rory P. O'Shea (2007) Scott Shane (2007) Umam,Dhewanto,Larso(2008) Jeffrey S.Hornsby (1993)	Demographic characteristics Researcher's experience and knowledge Psychological characteristics motivation Researcher networks	Personal factors
(2006) Rasmussen North,D.C (1990) Rory P.O'Shea, Harven Chugh, Thomas J.Allen (2004) Nathalie Moray	University's Culture University's policies Social capital University goals and mission Experience / contract	Institutional factors

Results in the qualitative part has Confirmed organizational, environmental, personal and institutional factors as identification of the Factors that affect in choosing the university research commercialization strategies. In this research another factors called technological factors, have been identified as Effective Factors in choosing the university research commercialization strategies. According to qualitative part, organizational factors consist of resources, management, structure, process and knowledge management. Environmental factors include financial markets, infrastructure, labor market, industry characteristics and government. Technological factors are considered to be technology level (innovative ideas, invention, patent, commercialization sample, consumer product) and intellectual property. Personal factors include demographic characteristics, researcher's experience and knowledge, psychological characteristics, motivation and researcher networks and finally institutional factors consist of university Culture, university policies, social capital, university goals and mission and experience / contract.

5. RESULTS (QUANTITATIVE PART)

A. Quantitative analysis of university research commercialization strategy through forming patent license

Figure 2 shows that technological factors are the most factors that affect in choosing the commercialization strategies through patent license. Figure 4 illustrates the effective components impact on choosing the commercialization strategies through patent license. According to figure 3 the most important factors that affect in choosing this strategy are University Culture, intellectual property, appropriate organizational structure, Researcher Communication Networks and appropriate Commercialization process and procedures in university.

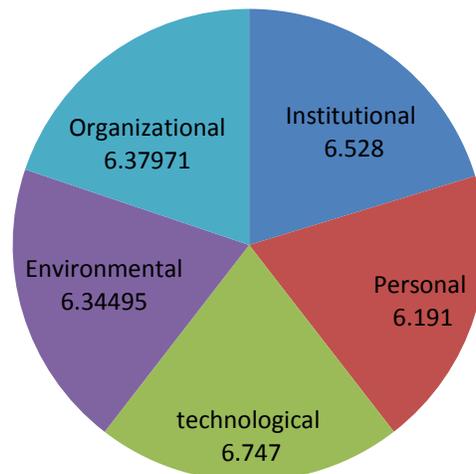


Figure 2. Major Factors that affect in choosing the university research commercialization strategies through forming patent license

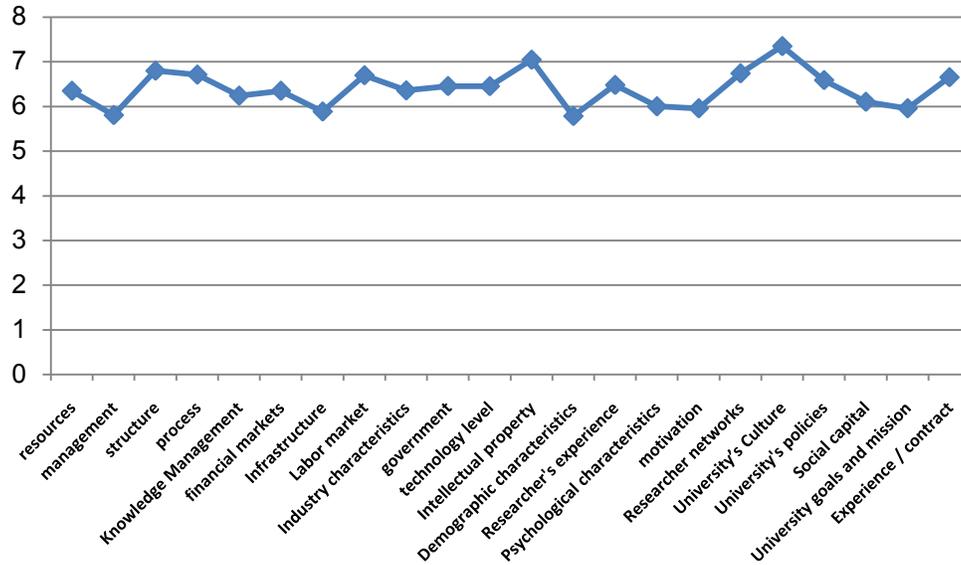


Figure 3. Secondary Effective factors in forming patent license strategy

B. Quantitative analysis of university research commercialization strategy through joint and bespoke research with industrial sector

As the Figure 4 has shown from Quantitative analysis, the institutional factors Has more effect in choosing the university research commercialization strategy through joint and bespoke research with industrial sector and afterwards organizational factors, Environmental factors have involved in the choice of this strategy.

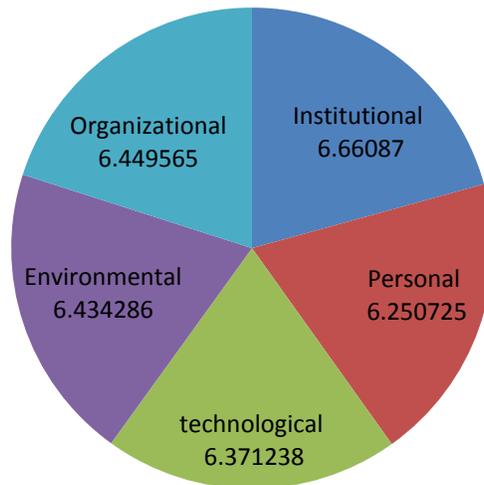


Figure 4. Major Factors that affect in choosing the university research commercialization strategies through joint and bespoke research with industrial sector

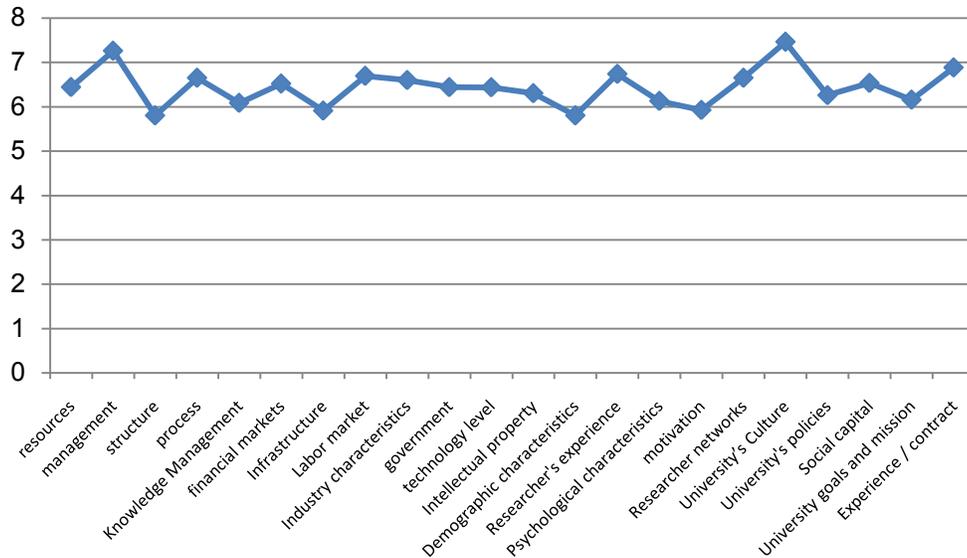


Figure 5. Secondary Effective factors in joint and bespoke research with industrial sector strategy

secondary Effective factors in joint and bespoke research with industrial sector strategy has been expressed as most important factors are university Culture, organization management, university experience, communications creation and commercial contract ,researcher’s knowledge and Researcher communication networks.

C. Quantitative analysis of university research commercialization strategy through establishing calving companies

Quantitative analysis of university research commercialization strategy trough establishing calving companies according to figure 6are considered the most important as institutional factors and then come personal factors and environmental factors.

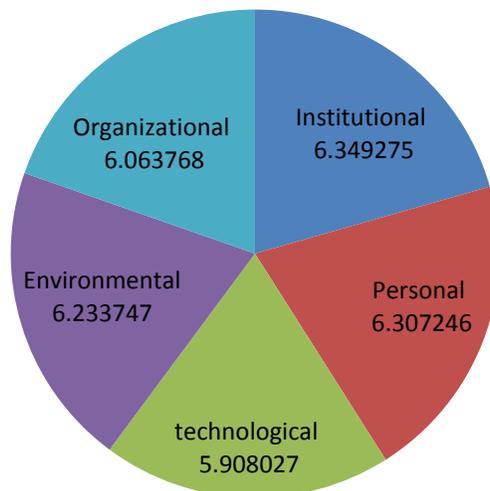


Figure 6. Major Factors that affect in choosing the university research commercialization strategies through establishing calving companies

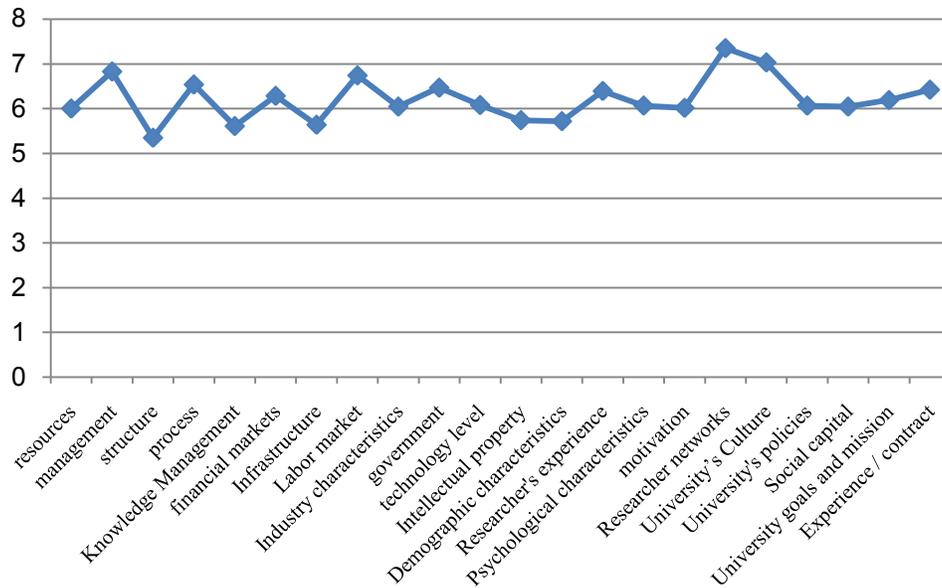


Figure7.Secondary Effective factors in establish calving company's strategy

Figure7 shows the quantitative analysis results in identification of the Factors that affect in choosing the university research commercialization strategies. Based on this result the most Effective Factors in choosing commercialization strategies through establishing calving companies are Researcher Communication Networks, University's Culture, University's organizational management and labor market.

6. CONCLUSION

Researchers believe the issue university research commercialization is one of the important issues of policymakers in the field of technology. The commercialization strategy must reflect the organization's business environment. Values obtained from the market for ideas have been beyond the values of assets to Special supplement. . In this article the effective Factors of university research commercialization strategies are identified. The results of this researching article besides confirmed O'shea's effective Factors of university research commercialization strategies other factors called technology has obtained. Organizational factors consist of resources, management, structure, process and knowledge management. Environmental factors include financial markets, infrastructure, labor market, industry characteristics and government. Technological factors are considered to be technology level (innovative ideas, invention, patent, commercialization sample, consumer product) and intellectual property. Personal factors include demographic characteristics, researcher's experience and knowledge, psychological characteristics, motivation and researcher networks and finally institutional factors consist of university Culture, university policies, social capital, university goals and mission and experience / contract. If university research commercialization strategy by establish calving companies and joint and bespoke research with industrial sector are chosen, Institutional component improvement should be paid more attention by University administrators. If university research commercialization strategy by forming patent license is chosen technological factors like technology level, intellectual property, patent and consumer product should got more attention.

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