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## Identifying and ranking academic entrepreneurship constraints in Islamic republic of Iran higher-level education system by Analytic Hierarchy Process (AHP)

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### ABSTRACT

*Regarding the research papers published recently, academic entrepreneurship seems vital to universities survival. In addition, there have always been some constraints to implement thought assets properly so that academic entrepreneurship can be shaped and identifying and removing these constraints is unavoidable. The current paper aims to identify and ranking academic entrepreneurship constraints in Islamic republic of Iran higher-level education system. The research method is applied and developmental and is descriptive and survey. The statistical population is 50 masters and elites of universities who are expert in the field of academic entrepreneurship. Data collection instrument is the paired comparison instrument with 20 items. To analyze data, AHP and the software Expert choice have been used. The results showed that academic entrepreneurship constraints are ranked in terms of importance and relative weight, individual constraints with relative weight of 0.487, organizational constraints with relative weight of 0.356, and environmental constraints with relative weight of 0.157.*

**Key words:** academic entrepreneurship, individual constraints, organizational constraints, environmental constraints, AHP.

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### INTRODUCTION

Academic entrepreneurship can be grouped into new functions of university after the functions of research and education. Change and development in society needs have brought about changes in university functions. It means that initial function of university is education but it has changed into research and will tend to academic entrepreneurship with new changes. A lot of factors have challenged universities and specially state universities such as increasing number of graduated students from universities, decreasing government budget in the late twentieth century and the paradigm of new governmental management dominance. In a nutshell, it can be said that increasing pressure on government and science, technology and research ministry and decreasing government budget recently, increasing number of graduated students, unemployment, youth particularly unemployed youth job crisis, change among universities candidates' expectations from university, competition, changing needs of market, responsibility, responsiveness against society different members, quality and productivity revolution, change in knowledge and necessity in knowledge change, knowledge trading, necessity of change in traditional education, tendency toward new education and applied researches, necessity in applying new technologies, and implementing other cases which caused change in university functions have made necessity of academic entrepreneurship and entrepreneur university as one of the strategic, vital, important and basic instruments of higher-level education to encounter with new changes and developments evident [13]. Nowadays, most experts and authorities in higher-level education, views academic entrepreneurship a necessity, because in the era of new technology and knowledge-based

industries role in world, regional and local economy, current crises can be tackled by reinforcing the interaction between university and agency [6].

Regarding this description, university presents graduated people to society who use knowledge alongside applied researches and create work by innovation. Therefore, it can be said that these days, the most important infrastructure of knowledge to reach a exhaustive growth is making academic entrepreneurship in universities. Generally universities face constraints on the way of academic entrepreneurship.

Therefore, regarding the vital status of university as the main competitiveness advantage in world economy and the main producer knowledge in regional and national economy, and university need to earn income and knowledge trading for survival, in the current paper, attempts have been made to identify and remove academic entrepreneurship in higher-level education system of Islamic republic of Iran by AHP.

### **Academic entrepreneurship**

As university is the main responsible sector to educate obligated and expert human sources, academic entrepreneurship growth help it grow better. Maybe students and graduated students change from searching for job to entrepreneurship is caused by understanding the fact that the competitiveness advantage of a graduated student is going beyond his knowledge and solve the scientific problem of that scope [17].

In 1970s, American universities have been criticized for not conveying new technologies to private sectors and firms so that the U.S congress has passed the law Bayh-Dole, which was synchronizing copy rights. This law removed the limitations of copy right for the universities which used governmental help. Investigations showed that this law has made universities executive forces and entrepreneurs which are looking for trading knowledge and knowledge-based technologies [8]. After passing this law, many universities established technology transfer offices to protect from their thought properties. Function of these offices which are called Technology Transfer Offices is simplifying transfer of trading knowledge (technologic growth) to give patent and other thought assets obtained from knowledge to industry. The patents of university from 300 cases in 1980 have changed to 3700 in 1999. The more important point is many products from key industries with high-technology including computer, medicine, biotechnology... have developed by the process of technology transfer from university to industry [17].

In the second half of twentieth century, new industries growth depends highly on university researches. Universities and industries owners went through negotiations with each other which include consulting, research contract, establishing research centers, and establishing company. As changes happened in universities, university rationality has also changed. University rationality change can be approached from three angles activity goal, the way of providing finance and promoting academic members. Before this, knowledge has been considered as a public product; therefore, the goal of university was expanding this knowledge without scientific application.

Recently this application has lost its use for analysis of university research behavior and explaining current changes in university system, therefore some of researchers introduced a new rationality which refers to the optimum competitiveness power to gain finance resources and knowledge-based forces. In the past, entrepreneurship was based on experience finance resources. In early 90s, however, innovative products based on knowledge, entrepreneurship based on knowledge and economies based on knowledge have developed while interacting with each other. In fact, the main reason of developing economy based on knowledge was appearance of innovation and entrepreneurship based on technology. Therefore, university as the most important source of production of new science can have entrepreneurship. The agency which is derived from university decreases trading challenges and develops a mechanism for moving the economic and technologic resources in regional and national levels. In fact, agency based on university is an agency is established based on technologically developed ideas by university members (academic members, students and staff) in university.

### **Academic entrepreneurship constraints**

With invention of Entrepreneur University in technology institute of Masachoset and expanding it to Stanford University in early and mid-twentieth century [3]. And necessity of trading of produced knowledge in universities, different researches have been conducted to cast light on influencing factors and constraints. Investigating academic entrepreneurship constraints by establishing Spin off firms, Wright et al have used the term "finance gap" referring to lack of sufficient resources for growing and transferring scientific transferring technology, and "used knowledge gap" referring to lack of knowledge and skills to start business and trading. These two concepts are considered as the most important factors of not going university toward trade activities [18]. Therefore, universities should both deal with removing finance problems and covering finance gaps for trading knowledge and produce required skills and abilities to trade knowledge and transfer knowledge and technology. It causes universities costs to decrease [9]. In doing so, in a research dealing with identifying influencing constraints in the way of transferring technology and

knowledge from university to industry, "cultural differences between university and business" and "need to have more investment to develop technology" have been realized as two main constraints in the U.S and Swiss. In England, "communicational problems" and "different finance expectations" were identified as the most important constraints [2]. Some researchers have considered ineffective management of thought assets as constraints and believe that formal management of total thought assets of university is a new concept and trend of transferring knowledge from university to other areas has increased, produced complexities has led to challenges in this area [15]. Technology transfer offices which are responsible for this transferring face with lack of experience and skills and ineffectiveness of these processes. It causes inappropriate used of thought assets [9]. Another source of problem in transferring knowledge to industries is university culture [10]. University culture is affected by the policy of "publish or perish" and caused that university members do not tend to go toward trading knowledge [16]. Some authorizes views trading knowledge is a threat for universities traditional cohesion and believes that academic entrepreneurship should be fought with, because growth academic entrepreneurship and trading knowledge lead to removing the independent role of university to criticize society [4]. Therefore, in some researches, developing basic infrastructures and institute innovations for producing and developing supporting and entrepreneurship culture is emphasized in university [7,11].

Another important issue for universities is lack of interest and motivation for researchers to present their inventions and their participation for more development through giving their patents [1]. There is always a concern that some parts of research proposals are misused without observing their copy right. Lack of confidence for protecting their copy right in industry also is a main constraint on the way of developing their business and using universities knowledge and technology [16]. Structures and processes of universities sometimes cause different trends toward activities of knowledge trading for example professional bureaucracy consisting of traditional borders can limit activities of university [1]. Seigel et al mentioned inflexible bureaucratic processes of university as one of the main constraints of trading knowledge for universities [15]. Policies which are determined at the level of universities may lead to different results in various institutes in a country. It is remarkable to say that universities like any other organizations are active in a wider environment and is affected by it. Laws and regulations passed by government particularly about management and protection from thought assets can affect university activities, for example against law of the U.S which make universities free in using trading advantage of their thought assets, in Europe, governments have directly some policies in promoting and simplifying transferring university technologies and knowledge to industry. These policies mainly ignore universities motivation for following this process [5].

## **MATERIALS AND METHODS**

This research is applied in terms of the goal and descriptive and survey in terms of data collection. The population consists of 50 university masters and elites in the field of academic entrepreneurship. To collect data, both field and library methods and paired comparison instrument with 20 items have been used. The questionnaire Cronbach Alpha coefficient is 0.92. To identify academic entrepreneurship, the results of the research done by Samiee (2013) has been used which is as follows:

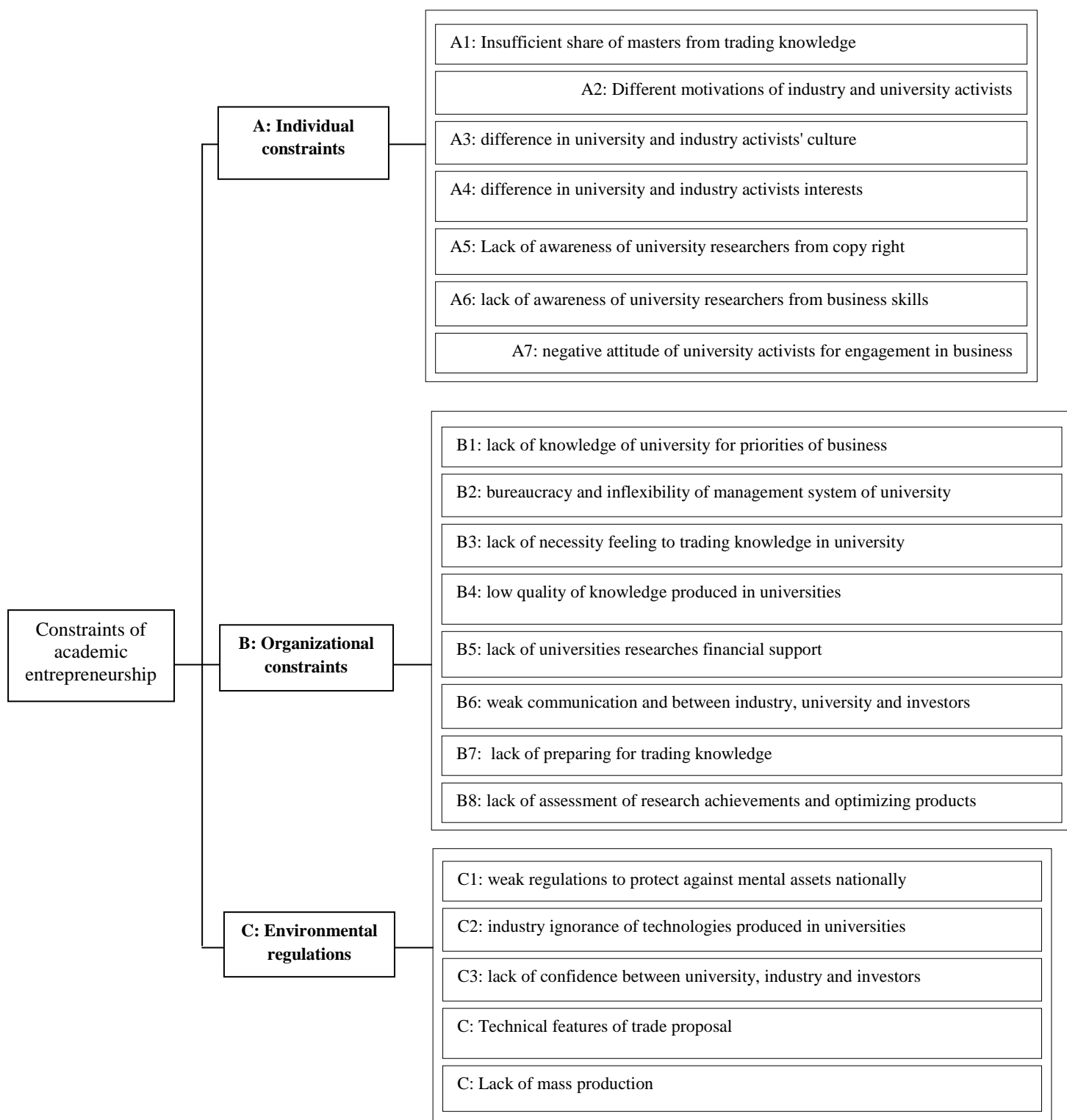


Figure 1: academic entrepreneurship constraints [12]

Regarding figure (1), to rank and determine the weight of each of the central and peripheral constraints of academic entrepreneurship, Analytic Hierarchy Process has been used full description of which is described below.

Based on AHP, in the first step, calculating weight of main constraints has been used (first stage). In this stage, relative weight of main constraints is measured by the software Expert Choice Team which contains individual, organizational and environmental constraints. In the next step, the weight of secondary constraints (local constraints) is used. In the third step, final weight of elements of each group which is equal to multiplying local weight of elements by weight their head (main constraints) is calculated, and then rank of each of these academic constraints for academic entrepreneurship in Islamic republic of Iran higher-level education is obtained.

## RESULTS

Regarding what has been done in AHP description of which has been presented. Academic entrepreneurship constraints ranking in Islamic republic of Iran higher-level education is as follows:

**Table 1: ranking academic entrepreneurship constraints and determining the final weight of main and peripheral constraints**

Main constraints	Main constraints weight	Peripheral weight	Peripheral constraints weight	Final weight	Rank (priority)
Individual constraints	0.487	A1	0.267	0.130	2
		A2	0.337	0.164	1
		A3	0.08	0.039	11
		A4	0.1	0.049	7
		A5	0.049	0.024	15
		A6	0.036	0.017	18
		A7	0.13	0.063	4
Organizational constraints	0.356	B1	0.06	0.021	16
		B2	0.311	0.111	3
		B3	0.048	0.018	17
		B4	0.10	0.036	12
		B5	0.146	0.052	6
		B6	0.086	0.031	13
		B7	0.126	0.045	8
		B8	0.115	0.041	9
Environmental constraints	0.157	C1	0.077	0.012	20
		C2	0.193	0.030	14
		C3	0.105	0.016	19
		C4	0.368	0.058	5
		C5	0.253	0.040	10

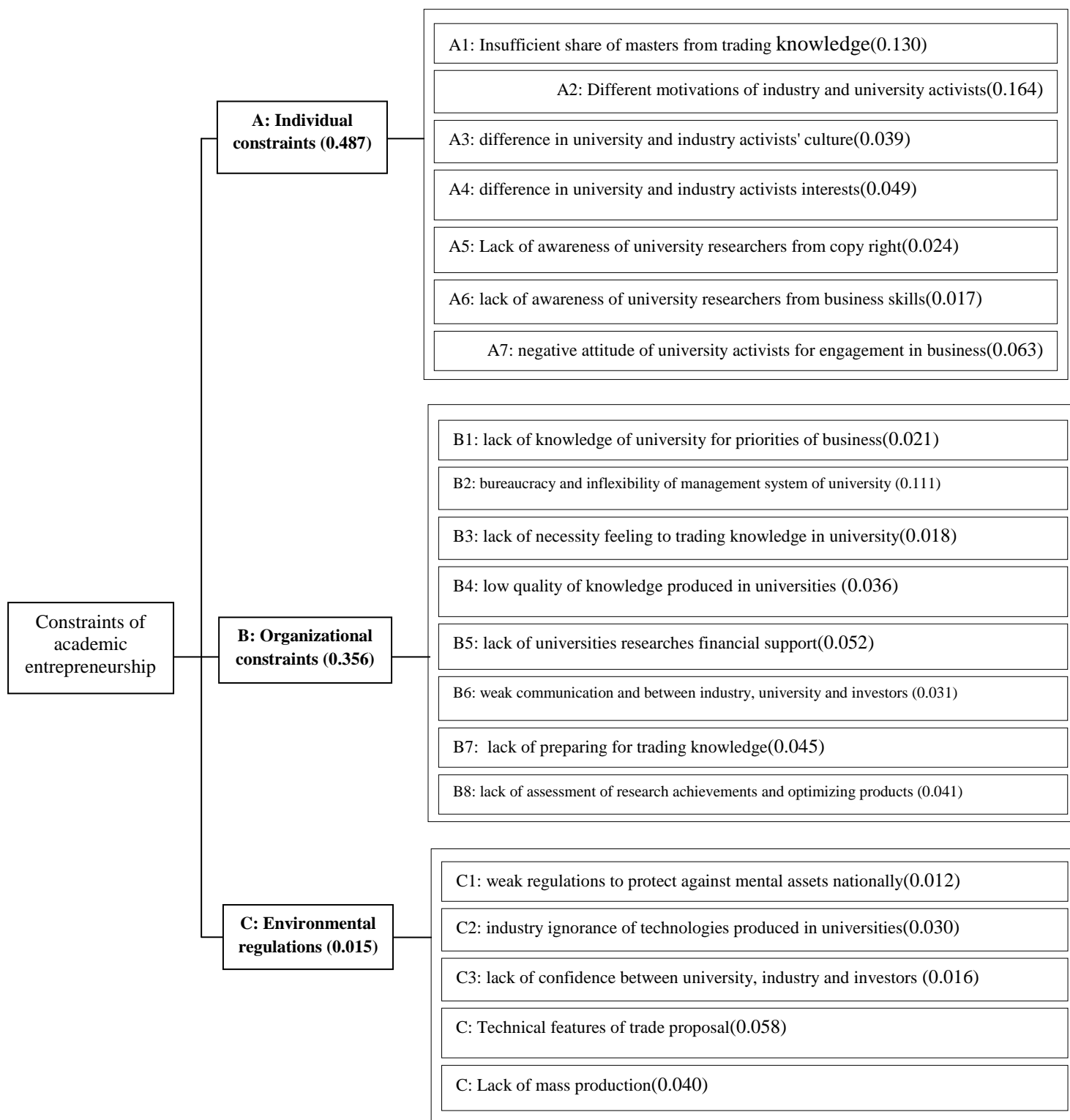


Figure 2: Ranking and determining the final weight of main and peripheral constraints

### CONCLUSION

As mentioned, academic entrepreneurship constraints based on Samiee (2013) model including three groups of individual, organizational and environmental are inserted in figure (13). According to analyses and findings of AHP (Table 1 and figure 2), individual constraints with weight of 0.487 rank first, organizational constraints with the weight of 0.356 rank second, and environmental constraints with the weight of 0.157 rank third. Findings obtained

from figure 1 show that the constraint of different motivations of industry and university activists with the weight of 0.164 rank first, the constraint of Insufficient share of masters from trading knowledge with the weight of 0.130 ranks second, the constraint of bureaucracy and inflexibility of management system of university with weight of 0.111 ranks third, the constraint of negative attitude of university activists for engagement in business with the weight of 0.063 ranks fourth, the constraint of technical features of trade proposal with the weight of 0.058 ranks fifth, the constraint of lack of universities researches financial support with the weight of 0.052 ranks sixth, the constraint of difference in university and industry activists interests with the weight of 0.049 ranks seventh, the constraint of lack of preparing for trading knowledge with the weight of 0.042 ranks eighth, the constraint of lack of assessment of research achievements and optimizing products with the weight of 0.041 ranks ninth, the constraint of lack of mass production with the weight of 0.040 ranks tenth, the constraint of difference in university and industry activists culture with the weight of 0.039 ranks eleventh, the constraint of low quality of knowledge produced in universities with the weight of 0.036 ranks twelfth, the constraint of weak communication and between industry, university and investors with the weight of 0.031 ranks thirteenth, the constraint of industry ignorance of technologies produced in universities with weight of 0.030 ranks fourteenth, the constraint of Lack of awareness of university researchers from copy right with the weight of 0.024 ranks fifteenth, the constraint of lack of knowledge of university for priorities of business with the weight of 0.021 ranks sixteenth, the constraint of lack of necessity feeling to trading knowledge in university with the weight of 0.018 ranks seventeenth, the constraint of lack of awareness of university researchers from business skills ranks eighteenth, the constraint of lack of confidence between university, industry and investors ranks nineteenth, and finally the constraint of weak regulations to protect against mental assets nationally with the weight of 0.012 ranks twentieth.

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