The Impact of Returning Iranian Experts on the Performance of Knowledge-Based Companies in Iran

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Abstract

 Many developing countries that faced the migration of their graduates to developed countries in previous decades are now witnessing their large-scale return to their home countries. The research method in this study is sequential data-based. In the first step, a qualitative study was conducted by studying the literature and collecting the opinions of experts through interviews, and then analyzing the results using content analysis. In the next step, a quantitative study was conducted by designing a questionnaire, distributing the questionnaire to a sample of the target population, and then analyzing the results using the partial least squares structural equation modeling method. In the qualitative study, interviews with experts and content analysis were used. Using the results of content analysis of the interviews and related literature, a questionnaire was designed for the quantitative part of the study. In the quantitative study section, the final model design was carried out by using the aforementioned questionnaire and then analyzing their outputs through partial least squares structural equation modeling. The resulting model suggests that "personality trait" directly affects company performance. "Social network trait" affects performance through the mediation of resource absorption. "Specialized trait" affects performance through the mediation of "technology capability development". This study also examined the effects of the control variables "company size", "company life stage" and "company field of activity" and it was observed that these variables do not have a significant effect on company performance. The findings of this study will greatly help in policy-making for cooperation with returning specialists, including residents and non-residents.

Keywords: Immigration, Performance, Knowledge-Based Company

.1INTRODUCTION

The report on the "Comparative Status of the Country in Migration and the Movement of Educated Individuals" concluded by studying international statistics that Iran is not one of the main migrant-sending countries in the world. Iran is not among the top 20 countries in the OECD report (2015) and is not among the top 30 migrant-sending countries in the World Bank report (2016) (Technology Studies Research Institute, 2016). On the other hand, the study of the level of expertise of Iranian migrants indicates the capability of Iranian migrants and it seems that whenever these people return to the country, they will have a significant impact on innovative and technological activities. The possibility of the correctness of this hypothesis is strengthened in the continuation of the Technology Studies Research Institute report, where it continues: In 2011, about 494 thousand Iranians were working in OECD countries, of which 323 thousand had a high-level education (higher education degree). Also, according to official statistics, 51.6 percent of Iranian immigrants to OECD countries work in high-skilled jobs and 44 percent work in jobs requiring medium-skilled jobs. In the list of countries with the most educated immigrants in OECD countries, Iran ranks 16th (Iran's rank in 2000 was 15th in the world). Although Iran is not among the main countries of origin of immigrants, it ranks 16th among the countries of origin of highly educated immigrants (OECD, 2015). According to a 2014 report by the Brookings Institution, Iran ranked first among 74 countries in the world in

the percentage of science, technology, and engineering students relative to the total number of Iranian students in the United States between 2008 and 2012 (Neil G. Ruiz, 2014).

Iran has formulated and implemented policies for the return (permanent, temporary, and rotational) and scientific and technological cooperation of experts abroad, and as a result, a large number of these individuals have returned to the country permanently or temporarily and are engaged in various business activities. In this regard, large resources have been invested in various institutions and organizations, including the National Elite Foundation, the Center for International Interactions of the Vice Presidency for Science and Technology, the Iranian Migration Observatory at Sharif University, the Innovation and Prosperity Fund, and 120 centers hosting experts abroad. Also, large resources have been allocated to projects such as the Cooperation Plan with Iranian Experts Abroad and the Connect Program for Cooperation with Returning Iranian Experts (temporary, permanent, or rotational) in order to successfully attract Iranian experts from abroad to the country. According to statistics from the Connect website (November 1400 connect.isti.ir,), so far 8,284 specialists have registered in the Connect system for scientific and technological cooperation, 285 companies have been established (some of these companies are in the registration process), 1,262 people have completed postdoctoral studies, 348 people have worked as visiting professors and study opportunities, and 3,750 lectures and workshops have been given by specialists. In addition to the official channels for the return of specialists, a number of these people with scientific and experimental experience abroad have returned and started their own businesses. The main issue of the research is the return of these specialists to the country and how to employ these people in effective positions in the country, considering the resources allocated to attract them.

Knowledge-based companies:

There is a great deal of variation in the definition of technology-based companies, and since this type of company was called "knowledge-based company" in Iran, it will be called that name from now on.

Knowledge-based companies are companies that are established by a group of entrepreneurs, based on the exploitation of technological inventions and innovations, and using a large number of capable employees

(Olga & Campos, 2011). In a study, Maki and Hytti (2007) defined knowledge-based companies as independent firms that are no more than 10 years old and whose activities are based on the exploitation of the technological resources of the firm, meaning that the firm actively develops, produces, and commercializes technology (Hytti & Maki, January 2007).

Migration:

The age of migration is tied to the age of the formation of human society. With the emergence of societies, population movement or migration also took place. The displacements and migrations that took place throughout history in the centers of ancient civilizations each had a significant impact on the fate of the world and caused a transformation in it.

Historical studies show that the migration of Iranians from the country is not only not new, but has also been repeated several times throughout Iran's long history and has repeatedly brought eternal and effective fruits in culture and development not only for Iran but for all of humanity. The migration of Iranians in the 4th century BC during the attack of the Macedonian generals

led by Alexander on the Achaemenid kingdom, the migration of Iranians after the collapse of the Sassanid kingdom, the migration of Iranians after the rise of the Seljuk government and the increase in pressure on non-Muslims, and then the next round, the extensive migration related to the developments after the Mongol invasion, which increased sharply with the rise of Timur the Great and then the Safavids. During this period, most of the Sufis preferred living in exile to staying in their homeland. In this movement, great mystics like Rumi and their many followers sought refuge in India, China, and the Ottoman Empire, and these migrations brought gifts such as the valuable books of the Mathnavi and Divan Shams to this country.

.2 RESEARCH BACKGROUND

The existence of appropriate infrastructure in the country increases the possibility of utilizing returning experts. Naghavi and Strozzi (2015) found that although emigration causes the loss of elites, under an appropriate intellectual property system, the knowledge acquired through their interaction with the home country flows back to the source and can be exploited, and thus the intellectual property rights system promotes innovation by creating an appropriate environment (Naghavi & Strozzi, 2015).

The extracted articles showed that returnees working at higher organizational levels lead to more innovation, more growth, better export performance, higher profitability and effectiveness. These returnees are a channel for facilitating foreign direct investment and trade. They also improve the level of innovative capacity of other local firms and form technological clusters and knowledge transfer, and increase the learning capacity of local firms, improving their performance.

Liu et al. (2016) studied the academic labor market for two groups, including returnees with PhDs from countries outside China and PhDs from domestic universities, and found that the structural hole in the social network of returnees only helps them in their initial advancement. While the internal networks that domestic PhDs have access to facilitate the first and subsequent advancements (Lu, Xiao; McInerney, Paul-Brian, 2016). In his article, Filatov (2009) combined two business research theories and the knowledge-based approach to study the factors affecting the export orientation and export performance of high-tech small and medium-sized enterprises in emerging economies. Using a database collected from 711 small and medium-sized enterprises in China's Zhonghuan Science Park, it is claimed that export orientation and export performance depend not only on capacity development through R&D and technology transfer but also on entrepreneurial characteristics such as international background and founder networking ability (Filatotchev, I.; Liu, X.; Buck, T.; Wright, M., 2009).

Gruenhagen (2019) provides a conceptual model that illustrates the micro-level characteristics of this phenomenon and the interaction with the institutional environment of the emerging economy by studying 11 returnees to China and their investments and firms. This paper discusses the insights from the case study in terms of the implications for entrepreneurial motivations, human and social capital, home-country alienation, internationalization behavior, and returnee investment goals (Gruenhagen Jan Henrik, 2019). Ma et al. (2019) examined the information on human and social capital of returnee entrepreneurs, including domestic and overseas capital, performance, and other control variables of 500 of their start-ups. They concluded that the overseas human and social capital of Chinese returnee entrepreneurs, as well

as their domestic social capital, but not domestic human capital, had a significant impact on their investment performance. Furthermore, while the domestic entrepreneurial environment did not have an effect on overseas human and social capital on investment performance, it provided a favorable environment for domestic capital to improve the investment performance of returnee entrepreneurs (Ma, Zhu, Meng, & Teng, 2019).

.3RESEARCH METHOD

The findings of the qualitative method are validated by the quantitative method and by means of a questionnaire. The approach of this thesis is qualitative and quantitative research topic and pays attention to different approaches in data collection and analysis, therefore the worldview of the thesis is pragmatic. Data analysis is usually related and the combination is done in the interpretation and discussion stage. It is worth mentioning that the exploratory design is used to explain the relationships when the variables under study are unknown and also to modify and test the theory or design measurement tools such as questionnaires.

In this research, a combined qualitative and quantitative approach (exploratory research design) is used to answer the research questions. The present thesis design has a short history and since 1990 the new theory of the benefits of elite migration for countries of origin began. In addition, the main phenomenon under study, namely graduate migration, does not have a very long history. On the other hand, the subject of the project in our country has a much weaker history, and most studies have been based on the traditional theory of loss of human capital due to migration and have been in the field of economic studies and sometimes sociology. Now, faced with the phenomenon of experts returning to the country, it is necessary to investigate and study the phenomenon exploratoryly, and it is necessary to examine the geography and existing relationships regarding the return of immigrants, the networks they create, and the performance of the companies in which these people work.

First, to discover the model of the impact of the characteristics of returnees on the performance of knowledge-based companies, a qualitative study was conducted, and then a quantitative study was conducted to strengthen the qualitative data. Thus, a sequential exploratory approach was used in this thesis.

In the first stage, the present study conducted a qualitative study to extract the main themes about the characteristics, effects, and mechanisms of the effect of returnees on the performance of knowledge-based companies. The data collection methods in qualitative research included interviews, observation, and study of documents.

The general method in this section is to survey and study a sample of the statistical population in question in order to examine the results of the qualitative part of the research and also to verify the model obtained in the qualitative part and obtain the final model.

The research is conducted on a community that all have that specific characteristic and the aim is to generalize the results of the study of a part of this community (sample) to the entire community. Knowledge-based companies that benefit from the cooperation of returning specialists, including permanent, temporary and rotating returning specialists in the board of directors or founders, were the target community of this research. The community of knowledge-based companies that benefit from returning specialists at the management level has 206 members.

Since the present study requires the collection of exploratory data to prepare a questionnaire or measurement tool, non-probability sampling was used and the study subjects were selected from among people with specific characteristics, which is called non-random sampling. Due to time, financial and human resource limitations, sampling methods are used to study the desired characteristics of a research. In order to generalize the results from the sample to the population, we must obtain the number of samples using a scientific and demonstrable method. The sample size was 48 companies, and for various reasons, especially the small sample size, the structural equation modeling method was used to draw appropriate conclusions.

.4RESEARCH FINDINGS

The findings in the qualitative research study were tested and examined using a questionnaire as a quantitative data collection tool.

Table 1. Items of the independent research variables

Description of the topic	Theme	Model variables
Characteristics of technology experience and business experience in returning professionals	Experience	Specialized feature Social network feature
Characteristics of opportunity recognition in returning professionals	Opportunity Recognition	
Characteristics of knowledge acquired by returning professionals abroad	Knowledge	
Characteristics of international approach of returning professionals in company management	International Approach	Social network feature
Characteristics of having a network abroad of returning professionals	External Communications	
Characteristics of having a network within the country of returning professionals	Effective Internal Communications	
The characteristic of returning entrepreneurs is based on the definition of 5 characteristics: Desire for success, resilience, positive self-perception, flexibility, and searchability	Entrepreneurial Personality	Personality feature
The characteristic of acceptance and the ability to continuously learn	Continuous Learning	
The characteristic of readiness to adapt and implement necessary changes	Applicability	

Table 2. Items of the research's mediating variables

Content Description	Topic	Model variables
Expanding foreign trade	Foreign Trade	Resource absorption
Attracting foreign investment	Attracting Foreign Resources	
Improving the company's reputation to attract domestic resources	Attracting Domestic Resources	
Spill-over of knowledge and experience back to others in the company	Knowledge Spillover, 21q	Technological capability development
Facilitating communications with abroad	Communication Facilitation, 25q	
Reducing the time to acquire new technology	Capacity Acquisition Time, 24q	
Transferring new knowledge and technology to the company	Knowledge Transfer, 29q	

Table 3. Items of the dependent variable of the research

Description of the topic	Theme	Model variables
New product development or product review	Product Development Performance	Performance
Sales volume and customer purchase continuity	Sales Performance	
The company's export volume after re-entry	Export Performance	
The company's profit volume after re-entry	Profitability Performance	
The company's willingness to produce new products and improve existing products	Innovative Performance	

The initial research model was extracted based on qualitative studies and presented in Figure 1. In this model, the "entrepreneurial personality" and "adaptability" indicators were added to the independent variable "personality trait", the "effective internal communications" indicator was added to the "social network trait", and the "opportunity recognition" indicator was added to the "specialized trait". Also, "internal resource attraction" was added to the mediating variable "resource attraction" and "communication facilitation" was added to the mediating variable "technology capability development". This model is examined and verified by quantitative studies.

Various analyses have been used to analyze the research data. In the first stage, convergent and divergent validity and the correlation coefficient between the research variables are examined. In the next stage, confirmatory factor analysis is used to examine the construct validity of the questionnaire questions, and finally, the partial least squares method is used to answer the research questions and prepare the final model of the "Model of the Impact of Returnees on Knowledge-Based Companies."

Table 4 shows the reliability and validity indices for all research variables. Discriminant validity was also used in the present study, meaning that ultimately the indices of each construct have provided sufficient separation in terms of measurement compared to other constructs of the model. In other words, each index measures only its own construct and their combination is in such a way that all constructs are well separated from each other. With the help of the extracted variance mean index, it was found that all the studied constructs have an extracted variance mean higher than half (0.5). Cronbach's alpha and composite reliability (CR) indices are used to examine the reliability of the questionnaire, and to confirm the reliability of these indices, a value of 0.7 is required, which is higher than 0.7 and indicates the reliability of the measurement tool.

Table 4. Validity, reliability indices

Cronbachs Alpha	CR	AVE	Indicators
0/756	0/842	0/575	Technological Capability Development
0/744	0/853	0/660	Resource Acquisition
0/825	0/876	0/591	Performance
0/827	0/896	0/743	Specialized Features
0/715	0/843	0/646	Social Network Features
0/816	0/892	0/736	Personality Features

.5DISCUSSION AND CONCLUSIONS

1- Library studies including books and articles related to the topic of elite attraction (elite flight) were the starting point of this research. The researcher soon realized that the future of this phenomenon is not in listing the disadvantages and proposing

contractionary policies, but rather it is necessary to interact with it as a phenomenon appropriate to the world without borders. The permanent or rotational return of skilled immigrants and the utilization of their capacity is the topic of discussion in today's world. A review of the country's policies and their results that have led to the cooperation of a wide range of returning immigrant elites (resident and non-resident) was sufficient reason for the need to continue research in the direction of studying the performance of these individuals. Therefore, the scope of the research was determined to evaluate and design a model of the impact of these returnees in knowledge-based companies as their most important point of return.

 -1The independent variable is the personality trait of the returnee, which includes the entrepreneurial personality (desire for success, resilience, positive self-perception, flexibility, ability to seek and develop opportunities), acceptance and learning ability, and adaptability. It directly affects the company's performance with a 99% confidence level and has no indirect relationship through any of the mediating variables. According to the studies conducted by the researcher, the personality traits of the returnee have not been reported in research and articles so far, but the interviewees have repeatedly referred to the personality traits of these people. For example:

Dr. Davari (returnee):

Those who have worked in developed countries have found the necessary self-confidence to enter and work in the industry while working (entrepreneurial personality).

Dr. Salavati, Director of the Migration Observatory:

Returnees have a more detailed and comprehensive view of finding opportunities and using them (entrepreneurial personality).

He continues:

When returnees migrate to a second or third country, they lose all these networks. They even have to abandon the skills they learned in their home country, such as language, and are forced to undergo a kind of intellectual, emotional, and educational reconstruction, etc. (adaptability spirit index).

Dr. Rezaei (returnee, director of a knowledge-based company):

I am very motivated, we can transfer the culture of working abroad, focusing on one area of work is one of the shortcomings of Iranians, instead of learning in the same area, they constantly change their field of activity (spirit of continuous learning).

Dr. Khaleqian, General Manager of International Relations at Pardis Technology Park:

We also have fewer naysayers and they understand the reality of the business world better and are more patient. The acceptance of the law by returnees is better and this improves their interaction with them (an indicator of entrepreneurial spirit).

Thus, this variable was examined in quantitative studies and a questionnaire, and its strong impact on the performance of returnees was confirmed by the research.

Despite this strong direct impact of personality traits on company performance such as innovation performance and product development performance, the mediating variables in the present study, namely resource attraction and technological capability development, have not been confirmed as mechanisms of influence. It is possible that this trait affects performance through other channels, and examining these channels can be the subject of further research.

3- The returnee's social network characteristics, including international approach, external connections, and effective internal connections, have a significant and positive effect on performance indirectly through the intermediary variable of resource absorption, while this characteristic has no effect on technological capability. Thus, if the returnee has a strong network abroad, even in the absence of technological capability, it can have a positive effect on the company's performance. People who participate in economic activities (tool elites - Dr. Mahmoud Saree-ol-Qalam, 2011), from businessmen and traders to people who do business internationally, usually have strong networks, and this characteristic can improve the performance of knowledge-based companies through the mechanism of resource absorption. It is concluded that the policy of attracting Iranians only from top universities or attracting people with high academic qualifications is worth considering and rethinking.

4- The returnee's specialized characteristic, including opportunity recognition, experience, and knowledge, significantly and powerfully enhances the development of technological capability, which also affects performance. Therefore, if individuals are attracted to the country based on their specialized characteristic, technological development will increase, and we should not expect an expansion in resource attraction, although this characteristic is likely to exist in specialists.

6. RESEARCH INNOVATION

According to the findings of the present study, the following have not been reported by other researchers so far and are innovations of this study.

• Investigating the mechanisms of returnee impact on the performance of knowledge-based companies

• The impact of returnee impact on the specific field of knowledge-based companies in Iran

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