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Key Barriers to Knowledge-Based Firms in Agricultural Industry

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Abstract

Given the importance of knowledge-based firms in the agricultural sector, this paper aimed to identify barriers hindering companies from becoming knowledge-based in the dominant competitive and dynamic environment. To this end, using a qualitative approach, in-depth interviews were conducted to collect data from 38 experts and managers in agricultural companies working in Alborz Science and Technology Park Isfahan, Hamedan, and Tehran University. The main criterion for determining the sample size was to reach the theoretical saturation. All respondents were selected using a theoretical and purposeful sampling method. Data coding and analysis procedures were completed in three stages. According to the results of the study, five main internal and external elements were identified: market inefficiency, governance-administrative barriers, inefficient union or organization, lack of skills and professionalism, and the internal inefficiency of the company.

Keywords:

Governance-administrative barriers; grounded theory; knowledge-based firms; the agricultural sector

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INTRODUCTION

In today's changing world, the infrastructure of industrial economies has shifted from the centrality of resources to the centrality of intellectual capital, which explains why the factor of knowledge is increasingly gaining importance (Fakhari, 2014). Besides, crossing the economy dependent on primary resources and rely on the sale of raw materials and products is only possible through the path of the innovative economy and knowledge-based production, especially for the Iranian economy, which has aimed inspiration in the Islamic world and enjoying advanced knowledge. As economic sanctions intensify against our country, paying more attention to knowledge-based companies and helping them develop and enhance their ability to get free from the sale of the country's natural resources and move towards knowledge-based production is highly essential (Bagheri, 2014). Also, many of the world's most successful companies are seeking to establish knowledge-based companies whose existence will lead to the formation of a knowledge-based economy. By definition, "knowledge-based economy" refers to an economy in which production, distribution, and use of knowledge can be considered as the main driver of growth, wealth creation, and job creation in all fields (Estiri & Moshiri, 2006). Such an economy is made up of a vast network of knowledge-based companies that create knowledge-based businesses for the sustainable transformation of knowledge into wealth, and their economic activities are based on R&D activities in new and advanced technologies (Hsieh, 2013). These activities include all activities that focus on commercializing their R&D outcomes, including the design, production, and supply of goods, services, and software, the production and supply of technology, the use of high-tech, high-value-added technology, and delivery of consultation and professional services (Mahdi et al., 2011).

The most important source of income generation in these companies is "knowledge"

rather than natural resources, capital, or the unskilled workforce, and wealth is generated through the utilization of individuals' capabilities. Here, the role of software and hardware is not neglected, but manpower plays a central role in the growth and survival of these companies (Estiri & Moshiri, 2006). Sometimes the growth and survival are facing problems, and due to inherent risks and specific characteristics, growth sustainability becomes very difficult and vulnerable. Despite the great effectiveness of knowledge-based companies, research shows that most companies are either dissolved or remain small, and only a few are converted into larger companies (Khayatan et al., 2015). On the other hand, many existing companies tend to become knowledge-based companies (Ramezan, 2011). However, knowledge-based features cannot be created easily in their organization, and there are barriers to them (Samiei & Rezaei, 2011). They try to continuously move towards knowledge centeredness through elements such as culture and organizational identity, policies, procedures, documents, systems, and employees and develop a completely different model of organizational management (Jennex & Durcikova, 2013).

In order to become knowledge-based, companies hire university graduates in the first step, and in the next step, shift their context to the use of the experts who work through unusual problem-solving skills that require the combination of convergent, divergent and creative thinking (Jennex, 2014). In their attempts to become knowledge-based, companies are faced with two types of internal controllable factors and external and non-controllable factors. Internal factors are related to the management of the organization itself and external factors are associated with environmental factors (Stucki, 2009). Although many policymakers and companies emphasize the knowledge-based approach of Iranian industries, they face challenges in the formulation of the planning strategy toward the creation of knowledge-based companies

and industries as they lack sufficient knowledge to understand the key success factors for companies to become knowledge-based.

On the other hand, there is little research and academic knowledge in Iran on how to create knowledge-based companies. To build a knowledge-based economy and bridge its development gap with advanced countries, Iran has no way other than developing knowledge-based companies (Entezari & Mahjub, 2013). Recognizing the importance of knowledge-based companies and their role in the country, it is necessary to discover the barriers to achieving this. Besides, no research has ever been done on this important topic in the agricultural sector. Therefore, the authors in the present study aimed to examine the issues from the perspective of creating knowledge-based companies in the agricultural sector at the corporate and industrial levels and provide a more comprehensive view of the potential barriers and constraints. According to the Cambridge Business English Dictionary, the term *knowledge-based* is synonymous with *knowledge-centered* (Combley, 2011).

Based on what was mentioned, the main objective of the present study is to identify and explain the barriers to creating knowledge-based companies in the agricultural sector. Therefore, this study tries to answer the following research question: What are some factors hindering Iranian agricultural companies to become knowledge-based?

Knowledge-based companies

Knowledge-based companies are among the most influential factors in creating employment, innovation, social system development, and the formation and growth of a knowledge-based economy in any country. These companies that are usually formed to meet specific needs are a place to transform new ideas into customer-friendly products and services (Davenport & Prusak, 1998). The bargaining chip of knowledge-based companies is “creativity”, “innovation”, “flexibility”, and “the founders’ high motivation”.

These factors have been proved to be problematic for large corporations because of their slow structure, bureaucracy, and lofty hierarchy (Bagheri, 2014). Knowledge-based companies act as a driving force of a knowledge-based company and they play a key role in the development of a knowledge-based economy. The term *knowledge-based company/organization* in the literature refers to the companies that are the learner and the creator of knowledge and use the knowledge (implicitly or explicitly) to develop their products and technologies. In fact, this concept refers more to organizations that use knowledge creation and application processes to promote their business (Nonaka, 1998).

In the Law on the Protection of Knowledge-Based Companies, these companies are defined as: “*A knowledge-based company or institution is a private company or cooperative that is established for the synergy of science and wealth, the development of a knowledge-based economy, the realization of scientific and economic objectives (including the expansion and the application of inventions and innovation) and the commercialization of research results (including the design and production of goods and services) in the field of advanced and high added value technologies, especially in the production of related software*” (Law on the Protection of Knowledge-Based Companies passed in 2010 by the Islamic Consultative Assembly). However, there is no term as knowledge-based companies with these features in the international literature. In other words, concepts such as *knowledge-based organizations (KBO)*, *knowledge creating companies*, *learning organizations*, and *intelligent organizations* are considered synonymous with knowledge-based organizations in the international literature (Denisa Neagu, 2008). Knowledge-based companies can be divided into two small (conventional product-based companies) and large (holding) companies. Small knowledge-based companies have important capabilities such as job creation, pos-

itive competition, growth and development, and grow in line with emerging economies. The organizational structure of companies is very important in optimizing the role played by them. The nature and type of activity of or-

ganizations and companies are decisive in determining their organizational structure. Figure 1 displays the concepts related to knowledge-based companies:

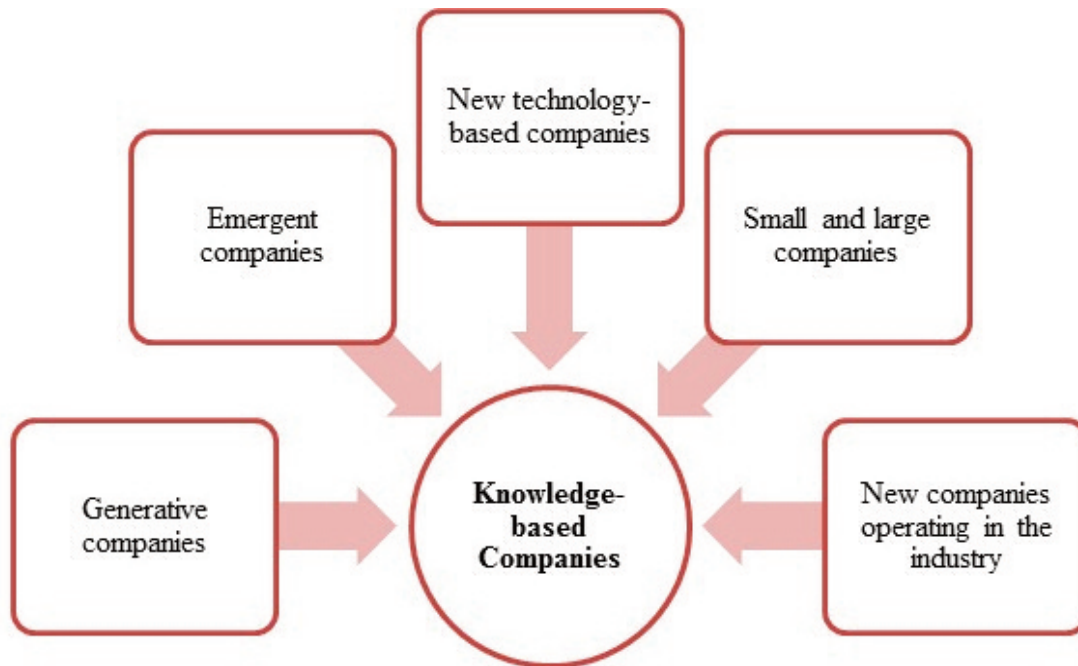


Figure 1. Concepts related to knowledge-based companies

Knowledge-based companies play a key role in the country's economy by commercializing scientific and technological achievements. In the direction of these companies, scientific development and technology development have been one of the focus of Iranian policy makers in recent years. But the main focus of these policy makers is on the inputs of the cycle of science production, the development of technology and commercialization of knowledge-based companies, and reinvestment on the production of science and technology and, in the meantime, less on the functioning of knowledge-based companies and factors. The internal and external influences on their success have been considered (Suzanchi Kashani, et al., 2014).

How do companies become knowledge-based?

One of the issues emerging from research

on knowledge-based companies is how companies can be turned into knowledge-based companies to create knowledge-based industries. These types of industries are, in fact, those industries that, while enjoying advanced technologies, rely on advanced scientific expertise and are characterized by high R&D costs (Zack, 2003).

According to Liebowitz's (1999) definition, in order for an organization to become knowledge-based, it should change towards focusing on the importance of internal and external knowledge of the organization and employ techniques to maximize the use of knowledge by employees, stakeholders, and clients. On the other hand, according to Nonaka (1998), creating a knowledge-based company is possible by creating a company that constantly creates new knowledge in the organization, distributes it extensively within

the organization, and quickly embeds it into its new products and technologies. Such a company is able to survive its business by creating to value for its customers and management, and it plays an important role in explaining and modeling production, R&D process, scientific and technical enrichment, education, human development, knowledge transfer and dissemination of innovation in the country (Clarke, 2001).

To the extent that a firm uses more knowledge in its structure, it will add to its value and create a more perfect development cycle. Knowledge-based businesses play a key role in creating a knowledge-based economy. In knowledge-based businesses, economic growth and job creation are realized in line with innovation capacity. That is the R&D achievements are continuously transformed by investing in new products, processes, or systems, and access to investment capacities for entrepreneurs and researchers is increased, and this is an important factor in creating innovation and exploitation of technological capability in the national economy (Zare, 2014). For companies to become knowledge-based, it is necessary to create contexts for the national economy and make internal changes in the corporate structure.

Various terms have been used in the literature to refer to knowledge-based companies. For example, Denisa (2008) uses concepts such as knowledge-based organizations, knowledge creating companies, learning organizations, and intelligent/smart organizations (Hosseinzadeh et al., 2019). However, almost none of them specifically addresses the barriers, either at the company level or at the national level, and they have mainly focused on the implementation of knowledge management and innovation, and the transformation of the organization into a creative organization.

Several studies have been conducted on the success or failure of companies in their attempts to become knowledge-based. In general, it can be suggested that various researchers have explored knowledge-based

companies by focusing on a variety of factors, such as governmental and organizational restrictions. In a field study, the researcher criticized authorities' double standards and their inability in the quantitative and qualitative promotion of knowledge-based companies. Besides, paying attention to the higher education system for the promotion of professors and elites by assessing their performance and the downturn trend of knowledge-based companies in Iran is a necessity for reviewing policies to the most minor issues of these companies (Gholipour et al., 2016).

In another study, Mansouri et al. (2017) provided a detailed analysis to identify the challenges faced by knowledge-based companies in science and technology parks and identified 59 challenges. The results of this study showed that 19 of the 59 challenges have had a more unfavorable impact on the surveyed companies. Some important challenges were the recession in the industry and the domestic markets, the country's economic problems, the imbalanced government support policies, brain drain and the lack of expert and innovative forces, and inadequate financial support.

The same conducted another study entitled "Prioritizing the driving forces for the development of knowledge-based companies in Kerman Province. The research population included all managers of knowledge-based companies based in growth centers and science and technology parks of Kerman Province. The factors of development and establishment of technology-related centers, cultural and social factors, human resource factors, supporting factors of knowledge-based institutions in the direction of technology production, government-related factors, and infrastructure factors were identified as the main driving forces (Mansouri et al., 2017).

Chase (1997) investigated the barriers to the creation of knowledge-based companies and found that organizational culture, lack of ownership in the problem, lack of time, lack of communication and information technol-

ogy, organizational structure, lack of standardization of processes, high-level management committee, over-emphasis on individuals over the group, the incentive system, the physical layout of the workplaces, the staff turnover are among the most important impeding factors. Besides, organizational culture and lack of ownership in the problem were found as the most contributing factors. Sharma (2006) found that the challenges facing knowledge-based companies are developing new products, the continuous development of new technologies, improper prediction of the behavior of competitors, constraints imposed by government laws and policies, poor advertising, and the existence of complicated competition. Suwannaporn

and Speece (2010) concluded that the lack of marketing research, technical risk, business risk, and limited distribution channels are among the constraints of knowledge-based companies.

The review of the literature shows that the study does not identify barriers to the knowledge of the establishment of active enterprises in the agricultural sector. In this paper, the first attempt has been made to identify the barriers in the knowledge base of active companies in the field of agriculture in a qualitative method based on grounded theory. Finally, the model and the pattern of relationships between the components are presented (Figure 2).

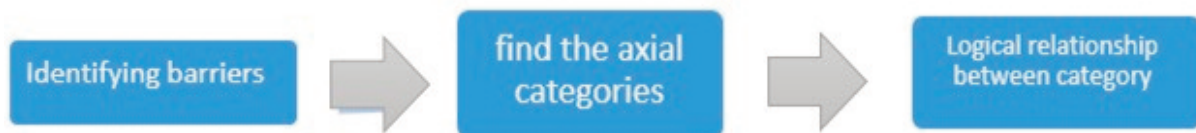


Figure 2. Conceptual formatting

METHODOLOGY

This study was arranged in a qualitative way based on the grounded theory and from three popular versions: 1) Strauss and Corbin, 2) Glaser 3) Charmas based on Strauss and Corbin. In qualitative research, findings are generated that are not the result of statistical operations or other statistical methods (Creswell, 2012). In qualitative research, the natural environment is a source of information and requires close interaction, and the researcher is one of the important data collection tools. Besides, the data are collected from multiple sources such as interviews, observations, documents, etc. and are analyzed deductively based on a bottom-up and recurrent approach that focuses on the participants' attitude, meanings, and opinions. The research design is generative; questions, forms of data collection, and even

subjects can be changed during the study and instead of a predetermined and pre-defined design, it focuses on the top-down interpretation of the problem and the subject matter (Creswell, 2012). Given the fact there are many controversial issues in the field of social sciences and management, there is a need to examine such issues through quantitative research because of its nature (Scriven et al., 1968). In fact, the main purpose of the research based on grounded theory is to explain the patterns that account for the social processes involved in the data (Munhall, 2012).

Since the purpose of this study was to develop a theory (the recognition of key factors for turning manufacturing companies into knowledge-based companies), a qualitative research design was used in order achieve three main goals: 1. To uncover and identify

a less-known concept and phenomenon and its underlying factors; 2. To present subtle details of the concept is difficult through quantitative methods. 3. Instead of attempting to explicitly explain causal relationships, the issues related to the subject matter should be interpreted and its various dimensions should be clearly illustrated.

Sampling method

A theoretical sampling technique was used in order to identify the obstacles to knowledge-based companies in the agricultural sector. In theoretical sampling, which is recognized as the dominant method in grounded theory, samples are chosen in a way that helps create the theory (Nilsson & Rapp, 1999). Indeed, researchers try to choose the best information sources, such as observation, interviews, or written sources, and then look for samples to complete the developed theory. In the grounded theory, sampling begins at first with simple sampling and then deliberately moves towards the maximum difference for the created concepts through purposeful sampling and ultimately leads to theoretical sampling (Hrebiniak, 2013). The participants were the experts and managers in agricultural companies working Alborz Science and Technology Park, Isfahan, Hamedan, and Tehran University. The studied companies met the knowledge-based indicators and requirements introduced by the Vice-Presidency Office of Science and Technology and had the full potential for the trends associated with this study. The sampling method used in this study was purposeful and snowball sampling. In the snowball sampling, upon the selection of the participants and collecting the needed data, they are asked to introduce the next examples (Creswell & Poth, 2017). Therefore, the interviews are often selected from people who had several years of management experience in knowledge-based companies. According to the grounded theory developed by Corbin and Strauss (2008), the suitable sample size includes 10 to 25 people, the increase of

which depends on the theoretical saturation stage, so that the data collection process continues to continue until new data are no longer collected from the interviewees (Hrebiniak, 2013). In this study, the sample consisted of 38 experts and managers in agricultural companies working in the science and technology parks. The main criterion for determining the sample size was to reach the theoretical saturation point. All respondents were selected using a purposeful snowball sampling method. The data were collected through in-depth interviews with the respondents. The interviews continued until theoretical saturation point, where the statistical samples did not provide new information on the issues under study.

Given that the main objective of the present study was to identify and explain the barriers to creating knowledge-based companies in the agricultural sector based on the grounded theory, the following research questions were addressed in this study:

What is the main reason for companies not to become knowledge-based?

What internal factors do hinder companies to become knowledge-based?

What external (environmental) factors do hinder companies to become knowledge-based?

Upon the completion of the recorded interviews, they were carefully transcribed for data analysis. Besides, second-hand documents and evidence were used to explain the developed theory.

Data analysis

After transcribing the interviews, the collected data were classified and codified using three coding stages; open, axial, the selective coding. Open coding is the first step in data analysis and is the analytic process by which concepts (codes) are attached to the observed data and phenomenon during qualitative data analysis (Munhall, 2012). In the present study, the interviews were studied several times and then, through content analysis, the initial concepts were extracted.

The second coding stage was axial coding, which is the process of relating codes (categories and concepts) to each other, via a combination of inductive and deductive thinking in the grounded theory. In this study, the relationship between the broader classes was created in the form of a paradigm model. This model includes the main phenomenon which covers causal conditions, the context, strategies, the mediating conditions, and the implications. The third stage of coding was selective coding. After determining the core class, open coding was stopped and the analyses focused more on a class called the core class, which accounts for the most changes that are related to the phenomenon under study. In this study, selective coding was used to analyze the relationships existing within the paradigmatic model.

Reliability and validity

Without scientific accuracy, a research (quantitative or qualitative) loses its utility (Upadhyay & Palo, 2013). Carbine & Strauss (2008) have proposed acceptance criteria instead of the validity and reliability criteria for evaluating theories based on the grounded theory. Acceptability means the extent to which the findings of a study are reliable in reflecting the experiences of the participants, the researcher and the readers with regard to the phenomenon under study. Crosswell and Poth (2017), following Strauss & Corbin (1998), emphasize these two approaches in terms of 1) The satisfaction with the research process, and 2) The empirical nature of the research (Crosswell & Poth, 2017). Consistency (comparing theory with the valid literature, controlling by the participants, controlling by similar samples, comparing external observers with the criteria in the valid works), methodological coherence, appropriateness and theoretical relevance of the samples, as well as the compilation and analysis of data simultaneously are among these methods. In addition, the reliability of research has been proposed by Guba and Lincoln (1986) as a criterion for evaluating

scientific accuracy in qualitative research. Using the mentioned elements, the research design was assessed in terms of reliability, generalizable, consistency, and verifiability.

Also, the credibility and generalizability of the research design were evaluated by three groups: Key informants, the participants in the study and similar samples, and experts. The confirmation was made during the study continuously and with appropriate modifications when required. The reliability of the data was assessed by the systematic methods of the grounded theory in collecting, recording, analyzing, and interpreting data. Verifiability was also checked by providing the collected evidence and data to experts and informants, as well as the participants and similar samples, using technical and field notes, and strategies for promoting theoretical sensitivity and avoiding bias during the course of the study.

To check the acceptability criterion to improve scientific accuracy, validity, and reliability, the following items were considered: The researcher sensitivity, methodological coherence, sampling relevance, replicability of the findings, and use of the informants' feedback.

RESULTS

Open coding

After collecting the data, they were transcribed and analyzed. Data analysis was performed in three stages: open coding, axial coding, and selective coding, as will be discussed separately. During the open coding process, the data were reviewed several times and by listing the barriers to knowledge-based companies in the agricultural sector as mentioned by the respondents, a code was assigned to each challenge, so that the codes were extracted exactly for the interview transcripts and similar concepts were encoded in the form of a single code as much as possible. Afterward, the extracted concepts were compared and, broad classes were formed after placing similar items around a common axis (Table 1).

Table 1
Conceptualization of Research Data (Open Coding)

Row	Concepts	Primary categories	Secondary categories
1	Smuggling similar products Immoderate imports of similar foreign goods Lack of trust in the innovative domestic products in the market The existence of market profitability in intermediary activities	Product barriers The lack of support for domestic production	Market inefficiency
2	Ignoring patents Centralization in the capital of the country Ambiguity in the knowledge-based indicators Lack of supportive laws	Legal barriers	
3	The slowness of decision-making and the public policymaking processes Administrative barriers to register knowledge-based companies The weakness of laboratory facilities and government assessment	Process barriers	
4	Politicization of the Office of Science and Technology Management in the country Corrupt administrative bureaucracy The existence of information rents	Administrative barriers	Governance-administrative barriers
5	Failure of banks to support innovative and knowledge-based projects Lack of liquidity for late return knowledge projects Lack of bonuses and standard incentives Lack of facilities fitting knowledge-based projects (insurance, tax, etc.)	The weakness of the supportive approach	
6	Lack of continuous and appropriate communication between universities and corporations Lack of connection with industry Weakness in the modeling of leading global companies	Weak communication channels	Unions or inadequate coherent organizations
7	Lack of research and technological institutes Lack of synergy between knowledge-based companies	The disintegration of knowledge-based companies	
8	The disintegration of elite and expert forces Lack of comprehensive and updated database for technological needs	The disintegration of specialist forces	
9	Ineffectiveness of academic sciences Failing to train professional manpower in small academic environments Education-centeredness instead of research-centeredness Lack of expert management	The inadequacy of the educational system	Lack of skills and professionalism
10	Weakness in corporate management The mere technical and professional perspective instead of managerial and market perspective	Lack of managerial and executive knowledge	
11	Weakness in creating a purposeful business plans Inefficient marketing research	Lack of business skills	
12	Fear of business risk	Risk Aversion	
13	The short-term and lucrative look of managers instead of long-term and sustainable look The existence of different views, power conflict among corporate managers The prevalence of white-collar culture among professional graduates	Inefficient organizational culture	Dimensions inefficiency within the company

Axial coding

In the second step, based on the axial coding paradigmatic model, the main category was selected from the list of categories (the previous steps) and was placed in the center of the axial coding process. In axial coding, concepts are based on common or semantic terms. In other words, the codes and initial categories that were created in open coding are compared and while integrating codes that are conceptually similar, the bundles that are related to each other are rooted in a common axis. In the research environment despite the emphasis on the barriers to knowledge-based companies in the agricultural sector, there is no mechanism for the relationships between these barriers. However, these relationships are more important than unique barriers. Also, this approach treats the existing processes as static processes, not dynamic and changing processes (Alsadhan

et al., 2006). On the other hand, there is a wide range of obstacles that can affect the successful implementation of knowledge-based principles as indicated in the literature (Yew Wong, & Aspinwall, 2005). Besides, the results of interviews and the extracted codes highlight the necessity of illustrating factors and relationships in the form of a very specific and concrete model.

Thus, based on the nature of the classes and the hidden relationships between them and determining the position of each category and its type of influence on the knowledge-based manufacturing companies in Iran, the initial model (Figure 3) was derived from the results of the interpretation of the extracted codes by considering the category at the center of this model. Finally, the results were interpreted and analyzed based on the literature.

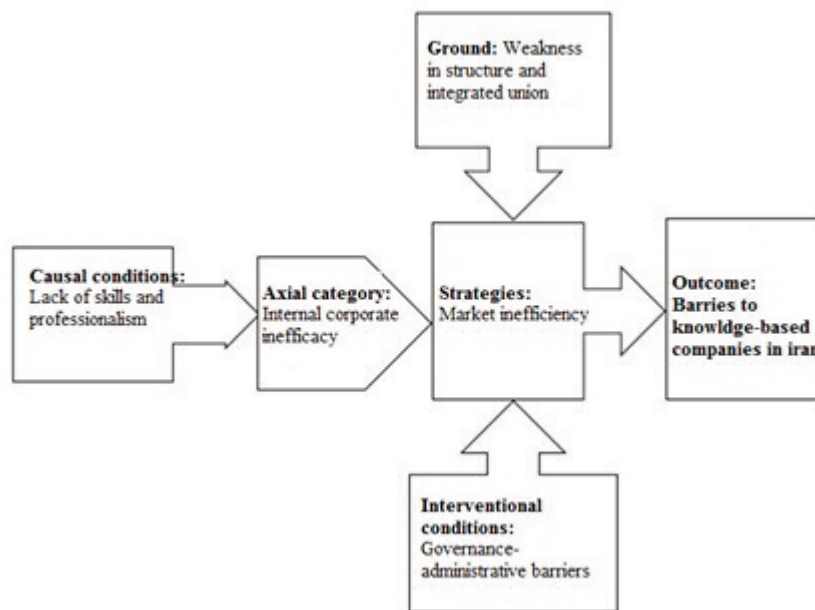


Figure 3. The initial model of coding the results

Axial category: Corporate internal inefficiency

Selection coding is the process of refining and improving categories (Strauss, 1987). In this phase of coding, the theorist of the grounded theory outlines a theory of rela-

tionships between the categories in the axial coding model. One of the important factors preventing companies from becoming knowledge-based in the agricultural sector is the low efficiency and basic problems of the com-

panies themselves, which are formed due to the lack of employee skills and expertise. This includes several dimensions such as business skills, risk aversion, and the lack of organizational culture. According to the opinion of the interviewees, the internal dimensions of the companies play a crucial role in their failure.

Interventional conditions: Governance-administrative barriers

The government should accelerate the formation of firms and encourage small and medium-sized enterprises. Another goal should be to adopt specific measures to ensure a business-friendly environment for the creation and development of innovative businesses (Xiao, 2008). Governments can help develop technological entrepreneurship by stimulating entrepreneurial supply and demand as well as providing soft and hard infrastructures (Checchi & Lucifora, 2002). In general, the administrative and governance barriers have the following key components:

Legal barriers: Legal deficiencies and issues related to the protection of knowledge-based companies.

Process barriers: Lack of facilitation and problems related to slow decision-making and policy-making processes.

Administrative barriers: Administrative bureaucracy and subsequent failure to comply with administrative ethics.

Lack of supportive look: The absence of a culture of supporting and encouraging entrepreneurship and work.

Strategies: Market inefficiency

Fama et al. (1969) defined the efficient market as a market "that quickly adapts to new information". Although adapting to new information is an important feature of the market, it is not its only feature. In fact, an efficient market gives investors the confidence that they all have the same information.

Context: Weaknesses in the structure and integrated union

Unions play an important role in expediting and improving the goals of the company.

Unions not only offer bargaining power but also protect against adverse risks in the labor market, and similar support is provided by labor market institutions (Checchi & Lucifora, 2002).

Lack of skills and professionalism

Research shows that the lack of a professional and skill-based look is one of the most important challenges facing companies to become knowledge-based. Research on small businesses suggests that solving the external challenges and issues of such firms is necessary by holding training courses such as vocational and counseling training courses for the owners of such firms (Bolton, 1971). Knowledge about how to create and develop business technology is limited. In other words, students of engineering and technology knowhow to commercialize their ideas in the field of technology. In fact, providing education on the commercialization of technology by educational institutions to students and technological business owners is a very important topic for business development. In general, the inadequacy of the educational system and the lack of management and executive skills are the main dimensions of this category.

Selective coding

In the third step, i.e., selective coding, we tried to establish logical relationships between the classes produced in the previous steps in a systematic way and to prove them through the research. At this step, the relationships between the classes derived from the first and second stages were proved through a narrative description.

As shown in Figure 4, most of the barriers faced by companies to become knowledge-based are linked to each other in a chain wise and have a positive and negative impact on each other. At this stage, as it is shown in Figure 4, the relationships between the barriers faced by Iranian companies to become knowledge-based results are displayed in Figure 5:

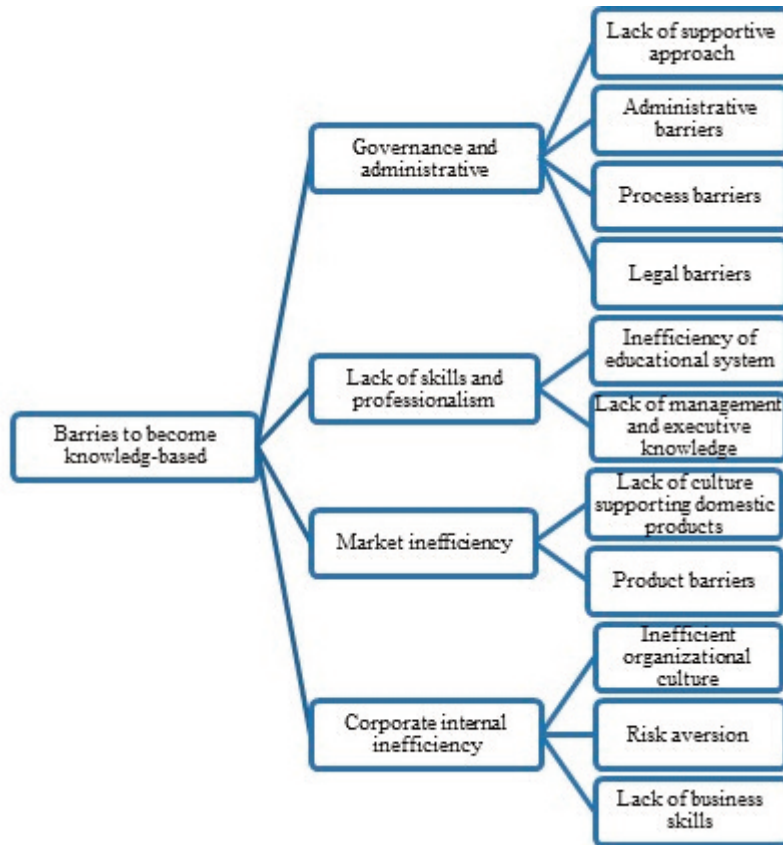


Figure 4. Main barriers facing companies to become knowledge-based

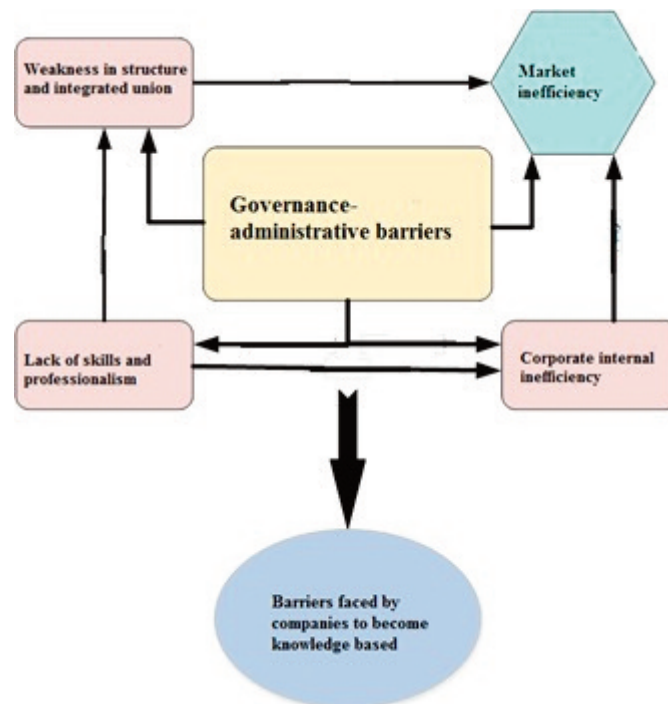


Figure 5. The relationships between the main barriers facing companies to become knowledge-based

As it is shown in Figure 4, the government due to its inefficiency has failed to perform its duties in an appropriate and competent way and thus has not been able to train knowledgeable and competent forces with required skills for the pursuit of agronomic activities. In addition, in spite of its potential capabilities, the government has not been able to solve the internal problems faced by companies. The government has also failed to provide a suitable context for the unity and the establishment of economic enterprises. Furthermore, it has not been able to increase the efficiency of the product and service market to boost the market and increase domestic production through its policy mechanisms.

The existence of a knowledgeable and capable (professional and skilled) force is necessary for paving the way for the transformation of existing companies into knowledge-based companies, as the internal problems faced by Iranian manufacturing companies created major problems in establishing unions for the economy and have indirectly led to market inefficiency.

The ineffectiveness of Iranian companies caused by a number of factors, including the lack of professional and managerial skills and weaknesses in the administrative and management system of the country, has directly affected market inefficiency and has led to the formation of intermediary and non-productive markets.

The weakness in optimal communication between companies and the creation of unions when successful companies are forced to use all capacities in partnership with others is a great hindrance to the fundamental change of companies from ordinary companies to knowledge-based companies, which in turn leads to the market inefficiency.

Market inefficiency is the most important reason for the lack of incentive and motivation among Iranian manufacturing companies to change the nature of their activity, and so many companies do not move towards knowledge-centeredness as they see the current market conditions and the market's un-

willingness for knowledge-based products and profitability.

CONCLUSIONS AND SUGGESTIONS

Today, given the growth and development of academic research in the field of superior technologies, knowledge-based companies play a significant role in stimulating entrepreneurship and economic growth. In Iran, in spite of the attention paid to knowledge-based companies and the efforts of managers and craftsmen, the need for organizational changes to become knowledge-based companies that, in the light of the high power of science commercialization, can compete with the corresponding foreign companies, unfortunately, most of these companies are faced with many limitations and barriers to achieving this goal. Based on the results of this study, in the first stage (open coding) 31 statements from interviews have been explored. As well as the barriers facing agricultural companies to become knowledge-based are divided into five main elements. These five main categories are: "Market inefficiency", "Governance-administrative barriers", "Unions or inadequate coherent organizations", "Lack of skills and professionalism" and "Dimensions inefficiency within the company". In the selective coding and axial coding step, pattern of relationships between the categories were discovered.

Based on that the corporate internal inefficiency in developing knowledge in the company is the first main element. It includes three dimensions: lack of business skills, risk aversion, and inefficient organizational culture in developing and expanding knowledge in the company. The directors of these companies generally have either no business plan or no business purpose in creating their businesses. Also due to inefficient marketing research, in their after-production processes, they face major problems.

The role of the government as an interventionist actor is also highlighted in terms of barriers and limitations of knowledge-based companies. Governments play a facilitative

role the formation and development of small and medium enterprises (Xiao, 2008). However, the major administrative-governmental issues have resulted in many restrictions for companies, which include four dimensions of process, legal, administrative and supportive barriers. Generally, there is a legal gap in support of knowledge-based companies in the agricultural sector including the lack of facilitation, the slow decision-making process, administrative bureaucracy and related ethical problems, and finally the lack of a culture of protection and encouragement of work and entrepreneurship. The findings of this study indicated that the government has not only failed to play a constructive role, it has also disrupted the growth of companies.

Another key element discovered as a barrier is the weakness of the structure and the integrated union. Having a coherent organization protecting their interests, knowledge-based companies can have more bargaining power against governments, academic centers and universities, and foreign competing companies. However, due to several reasons such as poor communication with the industry (Chase, 1997), sophisticated and turbulent competition in domestic and foreign markets (Gholipour et al., 2016), the disintegration of knowledge-based companies, the lack of a comprehensive database of technological needs, the weakness in modeling and modeling, and supportive factors of knowledge-based institutions (Mansouri et al., 2017), there is an urgent need for a strong organization and union that would result in increased companies' synergy.

The lack of skills and professionalism was recognized as the fourth element. Research on small businesses suggests that solving the external challenges and issues of such firms is necessary by holding training courses such as vocational and counseling training courses for the owners of such firms (Bolton, 1971). Since the majority of activists of knowledge-based companies in the agricultural sector in the country are people with technical and engineering perspectives, the lack of participa-

tory capability is one of the key issues and challenges. The inadequacy of the educational system, along with the lack of managerial and executive knowledge, is one of the factors pushing the companies into slowing down the commercialization of products.

Ultimately, the last recognized barrier is market inefficiency. The results of the present study indicated that smuggling of foreign goods and products, foreign imports, surplus imports, and the lack of adequate national confidence in domestic innovative products and the value creation through intermediary and brokerage activities along with the devaluation of production and work culture and entrepreneurship are the reasons why domestic innovative products are not accepted by the domestic market, which makes it harder for domestic knowledge-based companies to compete with foreign companies.

Based on the findings of the study, the following suggestions are offered:

According to the results of the research, it is recommended that the government act in three parts to remove the barriers of knowledge-based companies and strengthen cooperation and synergy. Firstly, the training of competent and expert human resources in the inter-sectoral field. Secondly, creating an active and facilitated bureaucratic system with clear rules. Finally, providing financial and non-financial facilities, including tax and customs exemptions.

In order to increase the bargaining power and the synergy among these companies to help them become knowledge-based and expand their competitiveness, the formation of the union of technology-based companies is necessary.

Reducing smuggling, increasing the culture and trust in Iranian products, and supporting the companies that have changed their character and have been oriented to knowledge can provide a suitable context for the creation of knowledge-based companies within the agricultural sector.

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