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INVESTIGATING THE EFFECTS OF SUPPORTIVE POLICIES FOR KNOWLEDGE-BASED FIRMS WITH THE EMPHASIS ON THE MARKET INEQUALITY

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Abstract

Many researchers have identified innovation as the key to develop countries and encourage governments to support knowledge-based firms (TBF). In Iran, organizations such as the National Innovation Fund, the Vice Chancellor for Science and Technology and Science and Technology Parks have provided support to these firms. In contrast, some researchers and policymakers have called these supportive policies ineffective and have cited changes in the market equilibrium, rent-seeking, and added the fact that some supported firms are not knowledge-based. In this research, first, the supportive policies have been studied by documentary method and then, by conducting a survey, the effects of these policies on the development of these firms have been studied. The results explain the positive and negative effects of these policies on firms and market formation. The results show that the type of provided support has a significant effect on the inequality in the use of market opportunities by knowledge-based firms and other firms. Also, the government support structure has led to improper implementation of related supportive policies.

INTRODUCTION

Knowledge-based firms have been specifically identified as the main driver of technological development and economic growth in different countries (Czarnitzki and Delanote 2015). These firms help increase country's competitiveness by introducing new products and services. Therefore, in recent decades, based on the significant role of these firms in creating jobs,

policymakers in developed and developing countries have focused on promoting such firms. Meanwhile, the significant impact of Silicon Valley on the US economy has caused developed countries to develop and implement a range of programs to support knowledge-based firms (Müller and Rammer 2012). Policymakers and researchers have had an increasing attention towards these firms because they not only have direct potential economic growth, but also they have indirect effects on large company to create new markets (Czarnitzki and Delanote 2015). It should be noted that knowledge-based firms do not solely belong to developed countries, developing countries can benefit from these firms by promoting economic growth, increasing employment and income, and reducing poverty (Müller and Rammer 2012).

In order to achieve a knowledge-based economy, various measures are being taken to support these firms so that they could continue and facilitate their activities. For this purpose, governments formulate effective laws and policies for distribution of costs and economic benefits in societies. Many governments do not leave TBFs invisible hand and provide a program to develop technology-based firms such as loans and grants (Aramesh and Dehghani 2019). Knowledge-based firms' supportive policies in Iran has provided a policy package to guide and facilitate technology-based firms with high technologies and high value-added (as stated in the supportive policies itself) and has focused on production of high technologies. This program is one of the largest national programs in which several thousand firms have participated.

There are two main approaches regarding knowledge-based firms' supportive policies. The first approach is to use incentive policies instead of coercion ones and the second approach is to screen knowledge-based firms among dozens of firms, which is important because it could obtain information on the number and type of knowledge-based firms in the country. Since the general approach is selective, i.e. a number of TBFs are selected and included in the support program, when firms are labeled knowledge-based, they deviate from their own growth path and the evaluation process becomes more difficult. In this law, protection is solely defined in facilities. Therefore, some policymakers believe that the policies and tools provided under this law to support knowledge-based firms will lead to rent-seeking and corruption.

In general, in order to clarify the logic of providing various support to new firms, the present study seeks to answer this question: what are the damages caused by the implementation of supportive policies to protect knowledge-based firms in the country? This study tries to analyze different dimensions of this issue and its impact on the inequality of market opportunities.

LITERATURE REVIEW

Government Support of Knowledge-based Firms

In modern societies, most economic activities are carried out by market mechanisms and investment companies, which is true not only for most manufacturing sectors, but also for a large number of service sectors (such as health care and information technology services). However, governments may

also intervene in the markets to promote general economic fairness in the areas of legislation, education, environment, infrastructure, research, social security, and income distribution. In some of the above areas, there may be no market mechanism involved and the tasks are done through other mechanisms such as laying down rules and regulations (Taghizadeh-Hesary 2019).

One of the most important issues in science and technology policies is the government intervention to support knowledge-based firms. Over the past 30 years, knowledge-based firms have been recognized by researchers and policymakers as the cornerstone and the most important driver of economic growth and development (Virasa 2007, Gholami and RAMEZANI 2019); therefore, their promotion has become one of the main focus of policy-making (Niska and Vesala 2013, Gremm, Barth et al. 2018, Carayannis 2019).

In addition, policymakers believe that based on business environmental dynamism of knowledge-based firms and the barriers to their growth and development, the government and its subsidiaries should support these firms (Colombo and Delmastro 2002, Andrews and Criscuolo 2013, Sazvar and Yahyazadehfar 2019). There is also another view among various experts that technological advances in a country would not move in the right direction without government intervention (Hsu, Shyu et al. 2005).Several studies have identified market failure as the most important argument for government support (especially government assistance) for the development of knowledge-based firms (Atherton, Phillpott et al. 2002, Andrews and Criscuolo 2013).

The following are some cases of market failures as well as reasons justifying government intervention and support for knowledge-based firms:

1. **Technology spillover**: knowledge-based firms can protect the outputs of their research and development activities but their willingness to invest in such activities is usually low. Sometimes, due to R&D spillover, the benefits of R&D activities outweigh the benefits of the firm itself. Therefore, it is important to consider these conditions to develop policies such as granting tax credits to research and development activities (Ezell and Atkinson 2011, Huergo, Trenado et al. 2016). In this regard, Audretsch (2005) believes that in order to solve the problems related to technology spillover, only the government has the legitimacy to intervene and solve such problem (Ezell and Atkinson 2011, Huergo, Trenado et al. 2016).
2. **Limitation of financial resources**: One of the main limitations that market failures create for knowledge-based firms is access restriction to different resources, especially financial resources. In the real world, banks usually do not have the expertise to evaluate the quality of new businesses with high technology, and in contrast, these new firms do not have the right background and performance (especially products), based on which banks could evaluate them and provide loans and financial resources (Sharpe, Cosh et al. 2009). The result of the above conditions is lack of credit for new firms and the absence of financial intermediary organizations to invest in these firms. Several studies have confirmed the

fact that limited financial resources have a negative impact on entrepreneurial activity and innovation (Colombo and Delmastro 2002).

3. **Uncertainty**: one of the reasons for government intervention is the uncertainty regarding innovative activities. This innovation uncertainty, not only is related to the success of technological developments and innovation, it is also related to the uncertainty of success in innovations in the market and its commercialization. In other words, the output of an invention and innovation can never be accurately predicted by its input (Nishimura and Okamuro 2011). Therefore, in these cases, government intervention seems necessary and it can reduce risks by contributing to the costs of research and development activities.

As mentioned earlier, in addition to market failure, there are other reasons to justify government intervention and support for knowledge-based firms, some of which are mentioned below:

Impact on overall economy: According to the significant role of knowledge-based firms in the supply chain of large companies, their level of competitiveness has a significant impact on the entire supply chain and consequently the country's economy (Ezell and Atkinson 2011). These firms also have an important role in promoting economic dynamism and creating basic innovations in the economies of countries (Colombo and Delmastro 2002).

Global competitive pressures: Some policymakers believe that global competitive pressure causes developing countries to support their infant industries, and these industries are unlikely to develop on their own. Thus, government intervention and support for startups can support them against the powerful competitors of developed countries and provide necessary conditions for their growth and development (Hsu, Shyu et al. 2005).

Increasing return to scale: Information has the characteristic of increasing return to scale to the extent that once knowledge is created, it can be used many times regardless of the scale of production. Since a unit of knowledge can be used many times by different people, the cost of creating knowledge does not depend on the scale at which the information is used (Czarnitzki and Delanote 2015). Regardingly, the government can provide grants to research companies and institutions to conduct research activities and subsequently create knowledge, for example, in Horizon 2020 EU’s funding program, firms will be granted funds for research activities and these research firms are required to publish research results at the community level while considering intellectual property rights.

Before developing policies to support knowledge-based firms, it is necessary to first determine the purpose of support. In general, policymakers pursue some objectives by supporting knowledge-based firms including (Müller and Rammer 2012):

1. **Job creation and unemployment reduction**: in many countries, most employment possibilities are created by small and medium-sized firms (mostly startups) rather than large companies.
2. **Increased competition**: which leads to improved welfare, low prices and more efficient production.
3. **The increase in the rate of innovation and new technologies**: Startups often seek to introduce new products and services (product innovation) or improve production tools (process innovation).
4. **Accelerated structural change of the economy**: Startups are seen as a factor of structural change, and their formation is often equal to entrepreneurship in the field of creative destruction.
5. **Development of the local economy**: Startups can also eliminate the disadvantages of regional economies and reduce migration to large cities.

Reasons for the Ineffectiveness of Government support of Knowledge-based Firms

Despite various debates regarding the importance of government in supporting knowledge-based firms, government intervention does not always affect the success of these firms and it may sometimes fail. Autio et al. (2007) study on the policies of nine countries to support knowledge-based firms, indicated that the most important factors in the failure of government support for such companies are (Autio, Kovalainen et al. 2007):

- Information Limitation and the awareness of government policy makers and their incompetence to evaluate and select appropriate projects reduce the effectiveness of government policies and sometimes lead to policy distortion and wasting government resources.
- Regulations lead to market inefficiency. When there are limitations in the market that affect the development of startups, governments seek to reduce and support the costs of market inefficiency, rather than identifying the cause of this inefficiency.
- Governance issues: Setting up an appropriate ecosystem for the development of startups and technology-based firms requires efficient coordination between different government agencies and capable startup companies. However, sometimes in coordination among government agencies in charge of policy implementation leads to waste of resources and inefficiency of policy measures in a country.

In general, it should be noted that the ineffectiveness of supportive government policies regarding knowledge-based firms does not necessarily cause inadequacy, but sometimes the inefficiency of policies is due to their improper implementation (Huergo, Trenado et al. 2016). Therefore, in examining the effectiveness of different policies, all aspects should be considered.

Knowledge-based Firms

Knowledge-based firms were first employed by Arthur D Little group. In their view, an NTBF is a personal, independent business with less than 25 years of experience and is based on a technological invention or innovation with

significant technological risk (Storey and Tether 1998). Some of these definitions are:

- According to Bollinger (1983), knowledge-based firms are new and independent firms that are linked to a small group of founders with a high motivation to discover innovative and technological ideas (Bollinger, Hope et al. 1983).
- Aranico (2010) said that they are independent firms that are less than 10 years old and their business is basedon the development, commercialization or production of technology.
- New technology-based firms; they are young independent companies in high-tech sectors with the highest growth rate (Johansson 2007)

As can be seen, there is no comprehensive definition of technology-based firms. Meanwhile, Khayatian et al. (2015), by examining different definitions, listed a set of characteristics, which are (Khayatian et al, 2015):

1. Newness of department or technology: most of the definitions about the word "newness" indicated both novelty of the firm and technology.
2. Age: Some definitions referred to the age of firms and others did not, but instead they only referred to them as new established firms.
3. Size: Many definitions referred to the size of firms, and some considered these companies as small and medium-sized firms or firms started by a small team.
4. Independence: one key feature of these firms is their independence.
5. Characteristic of founders and Human Capital: Another characteristic of these firms is the characteristics of their founders and human capital that enable the firms to successfully adapt to changes in the market and in technology. Other authors pointed out the high level of education and technical knowledge of the founders of these firms.
6. Subject of activity: Exploitation of new technical knowledge or technology as well as concentration on research and development sector are listed as other features of this group of firms.

In the present study, considering that the researcher has considered knowledge-based firms, he has changed the definition of Khayatian et al., (2015) as follows and as a reference: knowledge-based firms are independent firms that have dedicated some resources to research and development; a large part of their human resources are people with high scientific and professional abilities; and their focus is on the development and commercial exploitation of an innovative idea; and they are also based on a technical knowledge with high technology that often uses intermediate or high technologies or innovative processes in its products, services or processes.

Tools to Support Knowledge-based Companies

Policy tools can be categorized by target groups and desired outcomes of the tools, or methods of intervention (e.g., financing or rules and regulations).Of course, these categories are not necessarily considered as alternatives, but they complement one another. According to Muller and Rammer (2012), policy

tools of knowledge-based firms can be divided into four general categories, which are briefly described below.

The first category, financial grants include:

1. Direct financial support, including grants to entrepreneurs for the development of an idea to develop a product,
2. Loan guarantee, including state-owned banks loans and encouraging private banks to give loans to startup firms,
3. Providing venture capital, both through the public sector and indirectly supporting private investors to enter the field by refinancing parts of private capital through government assistance or providing guarantee schemes.
4. Tax deductions for new businesses such as lower VAT rates.

The second category is the infrastructure consulting services including:

1. Legal and managerial consulting, providing free/inexpensive legal or managerial consulting services for entrepreneurs,
2. Infrastructures such as startup centers that provide affordable spaces and services for new businesses.
3. Marketing support for knowledge-based firms, including presentation at trade fairs to develop the new business and financial support to enter foreign markets
4. Supporting business angels, where business angels, those who invest in or participate in knowledge-based firms, could interact.

The third category, role-based models including:

1. Granting rewards to successful knowledge-based firms and to winners of business plan competitions that encourage others to follow their own business model.
2. Activities (especially advertising campaigns) to raise public awareness of entrepreneurship.

The fourth category is training including:

1. Activities at universities to provide conditions for graduates to find occupations, including training programs, awareness-raising and coaching programs. Training programs that teach entrepreneurial skills,are often seen as part of the curricular activities of schools, universities and other educational organizations.

METHODOLOGY

The present research is qualitative, objective, exploratory and descriptive. First, exploratory studies and reviews of previous research were performed. In the next step, the existing documents in supporting knowledge-based firms were reviewed. Finally, in order to provide new perspectives and in-depth analysis of supporting knowledge-based firms, the data obtained from in-depth and semi-structured interviews with experts were collected and analyzed. Data

collection were done according to the objectives of the research: document analysis and interview.

1. Observing and Reviewing Existing Documents of Knowledge-based Firms

Studying documents can solve some problems of the interviews. Problems such as Dispersion of responsiveness and there would be no need for the researchers to encourage participants to join the study. In this study, legal documents and regulations related to the evaluation and recognition of qualifications and supports of knowledge-based companies and institutions are applied.

2. Individual Interviews

In the second step and to accurately analyze different dimensions, the experts opinions were used. Purposive sampling was used to select the samples according to the purpose of the research. Relatively, in-depth and semi-structured interviews were conducted with eight experts in this field. The participants chose the time of the interviews and they lasted between 40 and 60 minutes, All the interviewees had PHD degrees and four of them were faculty members aging 35-60. Three of the interviewees had 6-10 years of working in this field and 5 had 11-15 years of work experience. Data collection continued until data saturation, i.e. the absence of new dimensions.

RESULTS

One of the reasons of the importance of supportive policies regarding knowledge-based firms is the participation of active institutions and the systematization of these policies which protect the development of technology and innovation. Based on the results, these supportive policies have not been efficient due to some theoretical and practical challenges; however, their potential seems to be beyond their current state. Any protection law can potentially prepare the ground for rent-seeking, so its weaknesses and vulnerabilities are highlighted here by emphasizing the inequality of market opportunities.

Misunderstanding the Concept of Knowledge-based Economy

In developed countries, less than 10% of knowledge-based products and services are related to high technologies. Knowledge-based economy is based on knowledge and technology, it does not necessarily mean high technology. Knowledge-based innovation can be seen in different areas and it is important for economic growth to use technology in various industries. According to one criteria regarding knowledge-based firms, a list of knowledge-based products has been published, all of which are based on medium and high technologies. This supportive policy seems to provide the basis for the superiority of some knowledge-based firms and is not compatible with equal opportunities of the market. This limitation of the attitude towards knowledge-based firms is not justice-oriented and may lead to the selection of market winners.

Focus on Product Innovation

Innovation can be different areas such as product innovation, service innovation, process innovation, organizational innovation, and market

innovation. However, supportive policies regarding knowledge-based firms concentrate on product innovations in specific areas of technology. Focusing on product innovation may support some firms and undermine others that could improve their performance, especially in terms of operational efficiency, by the support of such policies. The criteria of identifying knowledge-based firms are only related to the technical aspect of firms. Economic indicators, based on the market and business model should also be considered too. Therefore, this supportive policies can create a competitive advantage for some firms, while this was not its initial purpose.

Focus on Small and Startup Firms Instead of Economically Active Ones

After analyzing documents and interviewing experts, one of the criticisms of the supportive policies and initial executive regulations of knowledge-based firms is that the supportive policies has focused on startups and small firms. At the same time, firms are expected to be driven by incentives to knowledge-based activities. Based on the content of the supportive policies and the organizational affiliations of the authors of this policies, its target audience was mostly academics, not those involved in economic and industrial activities. In most developed countries, the major part of patents (as a measure of technology) is registered by large companies. Therefore, supportive policies of knowledge-based firms should protect all firms. The current implementation of these policies prefer some knowledge-based firms to others.

Restrictions on Users of these Supportive Policies

Due to incorrect understanding of the concept of knowledge-based economy, it is thought that a small group of geniuses with special university degrees are in contact with knowledge-based economy. Many owners of the largest knowledge-based companies, as well as many of the world's greatest inventors, did not actually have a university degree which could limit the use of support tools by non-academics.

Pressure of Semiprivate Company and Holdings

In different countries, we have observed the growth of non-governmental organizations and economic institutions in recent years. These organizations, which are called semiprivate company, have the potential to exert pressure on organizations involved in supporting knowledge-based firms. If this continues, it will cause problems for the National Innovation Fund in the future. Therefore, this should be more independent. Some semiprivate or large holdings with good financial condition, set up knowledge-based firms in order to be supported.

Simplifying the Role of Government support for Knowledge-based Economy

Government as a funding organizations, shapes business models and affects the processes from a regulatory perspective through development of standards and regulations. In some supportive programs, the government invests directly in knowledge-based firms. This is done by creating investment funds or providing low-interest and sometimes gratuitous loans and facilities to knowledge-based firms. But the main role of the government is its indirect role in the development and promotion of firms. The main task of the government is to facilitate and improve the business environment and pave the

way for innovation in order to create appropriate economic, legal and institutional infrastructure and help create a network of investors. The fact is that large knowledge-based firms at a global level, have grown through a variety of non-governmental financing instruments not through government loans and facilities. The role of governments has always been the creation of the right environment for private finance institutions to operate, such as venture capital funds, or development of appropriate rules for crowdfunding, and improvement of business and corporate laws and bankruptcy protection. Today, however, the performance of these supportive policies is equal to the performance of the National Innovation Fund. The fund is only one of the government's incentives to shape a knowledge-based economy, that is not the best solution. Other important incentives for government support include discounts and tax exemptions and reductions in government tariffs and duties.

Enterprise-based Approach to Government Instead of Governance Approach

In other countries, funds or supportive mechanisms whether governmental or non-governmental, are supported by the government, but their management and decision-making is not limited to the government, including Japan Innovation Network or the funds in European countries. For example, Innovation Network Corporation of Japan, which was established by the Japanese government to fund research and development activities, is represented by 12 major private companies and two banks, and the government does not interfere. Supportive government policies regarding knowledge-based firms and the implementation in the current situation have caused the government and the National Innovation Fund to provide the most support to knowledge-based companies, the initial capital of which is also provided by the government.

Direct and exclusive government involvement (rather than partnership with the private sector, delegation or council form) can be threatened by the followings:

- Unnecessary increase in complex government paperwork that in practice does not have the appropriate agility and brings dissatisfaction.
- Damage caused by government corruption
- Lack of inherent risk-taking of government managers and avoidance of baseless slander against them that leads to conservative and non-risky behaviors
- Market intervention that prevents the formation and development of market mechanisms and the development of financial institutions in the private sector. For example, with the growth of National Innovation Fund, it would be difficult to develop private venture capital funds, because the innovators and pioneers prefer to use the facilities of the fund rather than transferring their shares to these funds.
- Ignoring the main responsibility of the government in setting up regulatory bodies.

Parallel Organizations

One of the main ambiguities here is the role and position of the Vice President for Science and Technology and the Supreme Council for Science, Research and Technology. According to the description of the duties of the Ministry of Science, Research and Technology, supporting knowledge-based firms is one of the duties of ATF. On the other hand, technology and innovation is one of the most important and main fields of activity of the Vice President for Science and Technology and accounts for the largest volume of activities. Both organizations consider themselves in charge of the implementation of the above-mentioned supportive policies and their distinction has never been clearly defined. If such conflicts in the implementation of these supportive policies are not controlled in the first stages and do not coordinate different organizations and agencies, one cannot have high hopes for the effectiveness of this supportive policies.

Absolute view Instead of Fuzzy View

The process of evaluating firms is that in the first step, the applicant firms are evaluated by the Vice President for Science and Technology and companies that are recognized as knowledge-based firms, are referred to the relevant organizations to use the facilities, exemptions and legal and governmental incentives. This absolute viewpoint has made it difficult to provide facilities and support companies. Articles 3 and 5 of the supportive policies on the Protection of Knowledge-Based firms, have provided support and facilities, including low-interest or no-interest loans, but not all firms can be supported. In evaluating firms, it is necessary to define a range of firms and provide incentives accordingly, and in the long run, it would be possible to slowly transform large corporations into knowledge-based firms. Therefore, instead of competence, it is better to have a ranking system in which smaller firms are separated from large companies. In practice, it will be possible to provide facilities with higher preferential tariffs and a simpler evaluation process. In other words, instead of adopting an absolute view, it is necessary to create a ranking system which groups companies based on the extent to which they are knowledge-based. The current approach is not compatible with the concept of justice and excludes some firms from being supported (and take advantage of market opportunities).

Governmentalization Instead of Public-private Partnership

Technological development and innovation in the country is controlled by the government with the least participation of the private sector. This can be observed indifferent institutionalizations in this area. Such governmentalization can be identified in different parts of these policies:

A) Government Planning and Supervision

Implementation of these supportive policies at the level of planning, supervision and follow-up is the responsibility of the Superme Council for Science, Research and Technology (ATF). All 29 members of ATF are government officials except 3 members. In Japan, this council has 15 members, among which, only 6 members are government officials and the rest belong to private institutions or universities (elected by the prime minister,

mostly non-governmental universities). In the United Kingdom, this council has 20 members and except one member, the rest are not government officials.

B) Identifying and Determining the Examples of Knowledge-based Firms

All members are representatives of the government and no one from the private sector is present.

C) Dependence of the National Innovation Fund on the Government

One institutional damage is the dependence of National Innovation Fund to the government. The fund operates under the auspices of the High Council for Science, Research and Technology. However, the fund is not defined as a government entity and its administrative, financial and employment structure is defined independently of the government.

The members of the Board of Trustees are as follows: President (Chairman of the Board), Vice President for Science and Technology, Vice President for Strategic Planning and Oversight committee, Minister of Science, Research and Technology, Minister of Health, Treatment and Medical Education, Minister of Economic Affairs And Finance, the Governor of the Central Bank, the President of the National Elite Foundation, and three people elected by the President. The members of the executive board are also a combination of government officials who are also faculty members in public universities. Through interviews with experts, individuals who are the members of both Board of Trustees and the Board of Directors of the Fund can receive funds as financial support, which is one of the institutional abuses of this support scheme.

CONCLUSION

In order to examine the policies and laws related to government support of knowledge-based firms, this study used documentary analysis and interviews with experts and explained the gaps and problems of supportive government policies in this field. Accordingly, the analysis is justice-oriented and takes advantage of market opportunities. The results show that supportive policies are one of the major aspects of the development of knowledge-based firms in the country.

Based on the analysis, a major part of the problems of related supportive policies is the lack of proper understanding of the concept of knowledge-based economy and knowledge-based firms. In defining and implementing this policy, concepts such as knowledge-based firm, startups, high-tech and other similar concepts are indistinguishable. If we accept that the main purpose of supportive policies was to help the development of knowledge-based firms, then this contradiction does not seem reasonable. In fact, the resources allocated to implement these policies do not entirely cover large, experienced knowledge-based companies. It is therefore recommended to the relevant organizations to more accurately map the scope of these laws and policies. In addition, instead of choosing a simple solution, they should consider a comprehensive approach to identify firms and they should not consider innovation solely on the basis of its tangible outputs. Many industries in transition (or in need of transition) to a knowledge-based economy have key

problems that have deprived them of competitiveness. Supportive policies must consider this fact.

Another point is the positive discrimination in favor of academic professionals. It should be noted that competent people and technicians who are capable of entrepreneurship should not be kept behind and policies must be modified in order to avoid focusing on academic degrees and other variable criteria should be taken into account. Also multinational knowledge-based firms and international cooperation should be taken into account. Thus, supportive policies can help move towards a DUI approach. The diversity of indicators can eliminate the absolutist view and turn knowledge-based concept into a spectrum, and as a result, each firm can benefit from policies tailored to its needs and circumstances. In addition, support should be provided on a conditional basis to being knowledge-based.

It is also suggested that the executive mechanism (especially the fund) should be practically independent of the government / government organizations in order to get rid of the paperwork of the public sector and the relevant influence and pressure. The council management of these organizations related to the participation (or even full management) of the private sector and craftsmen can be considered as a solution. Its executive / legal mechanism can be studied in future researches. The experience of leading countries in management transfer of funds can be considered as a model.

Finally, the development of knowledge-based firms should not be limited to selective financial support. A systemic approach towards innovation development process can highlight a number of underlying / institutional factors that have not been considered before which include improving the business environment, eliminating corruption, developing domestic or international cooperation, etc., while the government's role is currently more limited to allocating aids and facilities through fiscal policies, and in many areas regression is visible.

Therefore, some main challenges are legal ambiguities, lack of comprehensiveness of supportive policies, partisanship, lack of necessary legal coordination, lack of transparency in the division of responsibilities, ambiguity in determining policy enforcement, non-implementation of some policies, nonparticipation of stakeholders in developing and implementing regulations, etc. Another important point is that the government's approach in supporting knowledge-based firms should shift from financial support to more serious support, such as encouraging foreign partners to invest in Iran for joint activities with knowledge-based groups. This approach has several advantages including the growth of firms to enter global markets, technology transfer in the true sense of the word, creating large international companies, and most importantly the training of specialized manpower with international experience which lead to wealth creation beyond defined standards and eventually GDP growth.

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