National Business Ecosystem base Knowledge: Analysis the Role of Universities in Promoting the Competitive Advantage of Businesses

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Abstract: The purpose of this paper is analyze the contribution of universities and higher education institutions to promoting the competitive advantage of businesses within the national ecosystem of knowledge-based businesses. We have been used cross-sectional data from 140 countries, structural equation modeling technique. This research is a quantitative applied study that has been done with a descriptive approach. Theoretical analyzes and empirical findings show that competitive universities are based on a dynamic learning community, a free economic system and a democratic political system, by contributing to production, Knowledge, human capital accumulation, social capital accumulation and innovative interactions with industry, government and civil society help to promote the competitive advantage and competitiveness of businesses. The most important proposal and policy that can be made based on this result is that the government strives to build a "National Business Ecosystem base Knowledge" at the national level and a "Sub-ecosystems of businesses based university" at the local and regional levels.

Keywords: Business Ecosystem, National Business Ecosystem base Knowledge, Competitiveness, Entrepreneurship University.

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Introduction

We live in the age of knowledge and the global economy of knowledge. The most important feature of this economy is competitive advantage and competitiveness based on knowledge and innovation (Lang, 2001).

In the global knowledge economy, universities and higher education institutions are expected to serve their ecosystem and contribute to its development and competitiveness .Studies also show that in developed countries, universities serve their ecosystem and contribute to its development and competitiveness (Lane, 2012) .However, in some developing countries based on material resources, such as Iran, universities are not in their ecological services and do not provide adequate assistance to their ecological development (Entezari, 1397).

Why? The answer to this question is not very clear in relation to many developing and less developed countries (especially in terms of competitive advantage – such as Iran). Because a review of the literature shows that related to this subject no study and not much research has been done in Persian or English. Accordingly, strongly felt gap of knowledge and in this regard is needed more research.

The purpose of this article analysis is to demonstrate the role of universities in promoting the competitive advantage of businesses at the national level by introducing the model of national business ecosystem. Studying the role of universities in promoting the competitive advantage of businesses

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from the two perspectives of theory and policy development of business competitiveness and economic progress in Iran can be important because a significant portion of the knowledge and skills needed to promote competitive advantage at different levels of the economy are promoted through universities and higher education institutions.

Even universities and scientific and technical centers can even be considered as the capacity, ability and infrastructure of countries' competitiveness.

Despite this fact, in the literature of competitive advantage and areas of decision-making and policy-making promoting competitive advantage at various economic levels has not been given decent attention to the role of these institutions

Basically, in developing countries such as Iran, there is no comprehensive strategy to enhance the competitive advantage of the economy. Also, there is no model and plan to promote the university's participation in the development of competitive advantage and competitiveness of businesses. In this regard is strongly felt the weakness of strategy and policy-making.

To advance the purpose of the research, three theoretical and policy orientations, namely "national competitiveness", "development of knowledge" and "business ecosystem" have been combined and a new conceptual framework has been proposed called "national business ecosystem". In order to analysis the empirical of this conceptual framework have been used, panel data from countries around the world. The required data is extracted from the World Bank database (in particular from the Doing Business report), the World Economic Forum's competitiveness report data, and the Global Innovation Index report data. The extracted data were analyzed by using partial structural equation modeling and Smart PLS 3 software.

This article is organized in four sections. In the next section, while examining the theoretical foundations and research history, in order to analysis the contribution of universities to promoting the competitive advantage of businesses at the national level is presented a new conceptual framework called "National Business Ecosystem".

In the third section, while describing the research method and data type, is described modeling of partial structural equations as an analysis technique.

In the fourth section, the research findings are presented on the output axis of Smart PLS software. Finally, a conclusion is made and represent appropriate suggestions.

Theoretical foundations and research background

A review of the literature shows that in the last thirty-five years, the concepts of "competitive advantage" and "competitiveness" have appeared respectively and rapidly at different levels of the economy (firm, sector, region, country and world) and Different dimensions have been expanded in terms of definitions and determinants. At first the concept and discussion of competitive advantage at the enterprise level was introduced by Porter (Porter, 1985) in his book Competitive Advantage: Creating and Maintaining Superior Performance. In this book, he showed that competitive advantage is at the heart of corporate behavior and performance.

According to him, when two or more companies compete in a market (locally, nationally or globally), If a particular company (or a particular country) has a competitive advantage over its competitors that they have a higher and more stable profit rate compared to them (or have the ability to earn higher and more stable profits). Indeed, Competitive advantage of a firm is an integrated and coherent set of its competencies and capabilities which enable the firm to always perform better than its potential and actual competitors. Potter's Discussions about the competitive advantage of firms and businesses was pursued by many other researchers in later years and expanded rapidly.

For example, Hey & Viliamson (1991) and Kay (1993) consider Competitive advantage based on the capacities and market position of firms; Peteraf (1993) bases on maintaining income higher than normal; Barney (2002) based on a set of non-imitable features, copied or removed; and Saloner et al. (2001) have defined and analyzed it based on the value of goods and services to the customer.

Sadri & Lees (2001) achievement of competitive advantage depends on the environmental position and internal capabilities of the firm. Wagner & Hollenbeck (2010) one of the best sources of business and creating a competitive advantage in businesses is to use the knowledge, skills and abilities of employees. Manzler and Hokanen (1995) believed that the level of international competitiveness in an

industry or firm depends on many factors at the micro and macro levels, and the dynamism of international competitiveness is achieved only when is considered a combination of diverse factors.

Porter (١٩٩٠) In his book named " Competitive Advantage of Nations" extended the discussion of competitive advantage to the city, state, region and country, and analyzed the sources of sustainable development in the modern world economy on the basis of micro-foundations (firm or corporation). In his opinion, In the modern world economy, progress is not a fate but a national choice. Competitiveness and progress are not limited to nations with desirable heritage. Nations choose progress that organize their laws, policies and institutions in order to increase productivity, while at the same time investing the capabilities and capacities of all their citizens in accordance with the needs of the development day and in various specialized infrastructures and industrial clusters that help efficient trade.

In the framework of diamond theory, Porter (1990) divided the reasons of countries' success in the global area into four groups, which are:

1. Input status (labor, capital and land),
2. Demand conditions,
3. Support and related industries (industries that supply technology, information and raw materials) and
4. Strategy, structure and competitiveness of the firm. The Diamond Porter model was developed in two directions.

The first direction was the introduction of the double diamond model, which was achieved by joining multinational activities (Rugman, 1991; Dunning, 2003). The second direction was to add human factors by proposing nine-factor model (Cho, 1994). Cho & Moon (2005) this two paths were merged with introduction of the generalized double model. Porter (1990) showed that regional and national competitiveness is more than the sum or average of the competitive advantage or competitiveness of its firms.In addition to the factors affecting the competitiveness of firms at the macro level, there are various underlying factors that affect regional and national competitiveness.

In fact, national competitiveness indicates the competitive position of a country in international markets compared to other countries, in terms of the level of economic development and the country's ability to produce products in international competition (Moon et al, 1998).

According to the above discussion, competitive advantage or competitiveness at the national level refers to an integrated and coherent set of Human capacities and capabilities, scientific, technical and economic Refers to Which cause that a country always performs better than its potential and actual competitors. Porter (1990) showed that advanced nations have achieved economic progress only through scientific and technical efforts. The competitive advantage of nations in global markets is based on creativity and innovation.

Also, Economic progress of nations instead of abundance of natural resources and cheap manpower depends on the production, distribution and use of knowledge; Countries' competitive advantage also increasingly depends on creativity and scientific and technical innovations. According to the theory of knowledge-based economics (Sum & Jessop, 2013), all the capacities and capabilities of an economy that lead to competitive advantage are directly and indirectly dependent on knowledge. The importance of knowledge in the economy and attention to it has been steadily increasing over time and process (Wildavsky, 2010).'Lane (2012) has shown that research universities have been one of the primary drivers of national competitiveness and the foundation of innovation-based economies. They play a role by Training skilled workforce, attracting the best elites from other countries, generating new knowledge, fostering creative activity, and knowledge-based innovation and entrepreneurship.

This indicates the vital role of universities in promoting the competitive advantage and competitiveness of businesses. In order to better and accurately study of the issue of competitive advantage or competitiveness among countries and the role of universities in their promotion requires a comprehensive look to the issue. This means that gaining competitive advantage in an economy is the result of the efforts, competition and cooperation of a diverse set of stakeholders and actors in that economy (including universities and higher education centers) and a variety of underlying factors that they are involved. In general, these interacting actors and their related factors that bring competitive advantage, competitiveness, and economic development to each other are called business ecosystems

(Moore, 1993). More specifically, the business ecosystem includes individuals, businesses from various industries, government agencies, legislators, and all those who they deal with business. Groups such as manufacturers of goods and services, universities and higher education institutions, customers, suppliers, distribution channels, legislators, labor markets, labor relations and the media are key components of a business ecosystem.

After Moore (1993) introduced the concept of business ecosystem, studies related to it have expanded in three directions. Moore (Moore, 1996, 2006) and another group of researchers (Peltoniemi & Vuori, 2004) analyzed the concept of business ecosystem more and more in depth and examined and developed its framework; Another group (Iansiti & Levien, 2002, 2004a, b) developed policies and strategies based on the business ecosystem; Finally, the third group (Cusumano, 2010; Isckia & Lescop, 2009; Wnuk et al, 2014) introduced cases of business ecosystem management.

In most studies related to the business ecosystem, the firm (company) has been emphasized as the main and central beneficiary of the ecosystem. For example, Iansiti & Levien (2004a) have divided ecosystem enterprises into three groups: the focal company (owner and shaper of the ecosystem), the reserve actors (anchorage), and the dominators. They have developed strategic business ecosystem paths from the perspective of focus companies.

However, Joo & Shin (Joo & Shin, 2017) by focusing on the role of the customer in the business ecosystem, showed that a sustainable business ecosystem is a source of competitiveness for firms and a source of competitive advantage.

Recently, Entezari (1400) analyzed the impact of the knowledge ecosystem on national competitiveness and showed that the production, absorption, distribution and promotion of knowledge, as four key processes of the national knowledge ecosystem, in interaction with its capabilities and capacities, which Formed in a suitable ecosystem, they affect the structures of national competitiveness. The activities of production, absorption, distribution and promotion of knowledge are mainly done by universities.

Universities play an important role in the national business ecosystem in general and the knowledge-based business ecosystem in particular because of their contribution to the production of knowledge, human capital, innovation and innovative entrepreneurship. In a knowledge-based business ecosystem in which universities play a central role, all abilities, capacities and competencies produce a knowledge-based competitive advantage. All the capabilities, capacities and competencies of the national ecosystem of knowledge-based businesses can be divided into three groups as follows:

1. Dependent abilities, capacities and competencies; These components directly define the competitive advantage of an economy. Total productivity of inputs, quality of products (goods and services), and innovation (in product, process, organization and market) are competencies; these competencies are also components of economic development at various levels. Actors and direct stakeholders of these competencies are Firms, Knowledge-based businesses and industries. National and regional governments and universities also indirectly play a role and earn benefit.

2. Intermediate abilities, capacities and competencies: These components contribute both directly and indirectly (due to the competencies mentioned in paragraph 1) to the competitive advantage of the economy. Innovative interactions of universities with industry and government in the form of industrial clusters (Porter, 1998; Mongkhonvanit, 2014) and innovation ecosystems (Ader & Kooper, 2010), knowledge-based entrepreneurship, excellent human capital, knowledge capital (intellectual capital), capital Social and information technology are among these capabilities. These skills are developed with the help of universities and higher education institutions in the long and short term. Hence, the direct actors and beneficiaries of these capabilities are universities and higher education institutions. Geiger (Geiger 2004, p.132) points out that the university system, with its decentralized and competitive structure, pursues the goals of innovation and entrepreneurship based on knowledge and innovation; they are an important source of competitive advantage for regions and countries.

For a university system to be a source of competitive advantage in a city, region, or country, they must have a competitive advantage of their own. An academic system must also produce quality, innovative and highly productive products and must always strive to develop them

3. Capabilities, capacities and competencies of the platform:

All actors and stakeholders in the national ecosystem of knowledge-based businesses operate in a variety of contexts. These include the learning community, the business environment, the political environment, the legal environment, and the economic regime.

The main and direct actors and stakeholders of these capacities are the people, the government, civil society and social communication media. Porter (1990, p.3) showed that differences in values, culture, economic infrastructure, institutions, and the history of nations all determine the competitiveness of countries. Thompson (2004) showed that free economies have a higher competitive advantage and competitiveness than closed and government-based economies.

According to the above discussion, the conceptual framework of the role of the university in knowledge-based business ecosystems and thus helping to promote the competitive advantage of businesses can be drawn as Figure 1.

The activities and interactions of knowledge-based ecosystem actors create a series of processes and capabilities that relate to the structure of the knowledge-based ecosystem. Figure 1 shows the relationship between the various components of the knowledge-based business ecosystem.
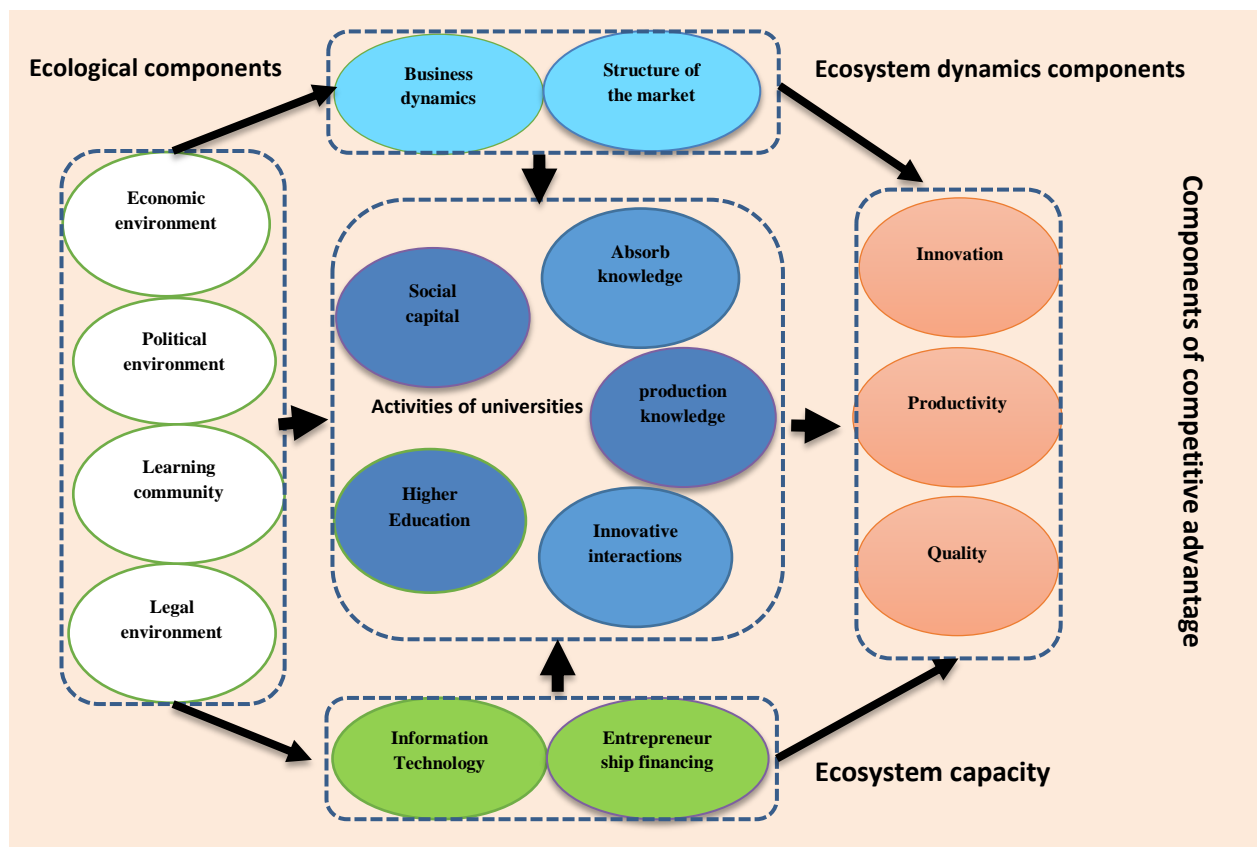

Figure 1. Conceptual framework of knowledge-based business ecosystem

As is clear from this form, economic, political, legal and public education environments are the basic and independent variables in business ecosystems. In contrast, the variables of innovation, total factor productivity and quality of products and services are dependent variables. Other variables are intermediate variables. Intermediate variables also affect each other and there is a cause and effect relationship between some of them.

In a knowledge-based business ecosystem in which universities play a central role, the components of the national knowledge-based business ecosystem can be divided into five groups:

1. Components of competitive advantage (capabilities, capacities and related competencies that directly represent the competitive advantage of the economy);
2. Result of the activities of universities (abilities, capacities and intermediate competencies that are directly and indirectly effective in creating a competitive advantage of the economy;
3. Ecological components (abilities, capacities and underlying competencies such as economic regime, learning community, political system and legal system); As mentioned, every knowledge-based business ecosystem is formed within the framework of a business ecosystem, part of the economic, political, social, legal and cultural systems form this ecosystem.
4. Components of ecosystem dynamics (such as market structure and business dynamics).
5. Ecosystem capacity components (such as entrepreneurship financing and information technology)

Within the framework of the national knowledge-based business ecosystem, intermediate and contextual competencies, capacities and competencies in relation to each other and directly contribute to the formation of related competencies, capacities and competencies.

Research Method

This research has been done with a descriptive approach (of correlation type) which is practical in terms of purpose and quantitative in terms of method. Research has been conducted among countries around the world. Hence, the statistical unit of research is a country and the statistical community is all the countries of the world. Of course, among the countries of the world, countries have been selected as a statistical sample that had sufficient statistical data for research variables for the last statistical year. The number of these countries is 140, and the data are for 2018 and 2017. Therefore, the data is panel type. Each variable of the national business ecosystem (processes, capabilities or contexts) is considered as a hidden structure or variable that is measured by several indicators. The data needed to measure structures are extracted from the 2018 and 2017 Global Competitiveness Index, Global Innovation Index and Global Business Report for 140 countries. In the mentioned sources, the data related to the variables are reported in three modes of rank, score and value. Value data is used here. Components of the national business ecosystem (i.e. research variables) into three the components of the national business ecosystem (i.e. research variables) are divided into three groups: dependent variables (components of competitive advantage at the national level), intermediate variables (processes of the national business ecosystem) and independent variables (capabilities and contexts of the national ecosystem). Business) can be divided. Most research variables are intermediate. In fact, intermediate variables are components that are influenced by other components while helping to promote competitive advantage in the economy. The basic factors affecting "intermediate and dependent variables" are independent variables. Statistically, all variables of the national business ecosystem are hidden and several indicators are used to measure them. The research variables and their measurement indices are shown in Table 1. Component measurement indices have been extracted from the mentioned sources based on the initial confirmatory factor analysis. That is, to measure the mentioned variables, indicators have been selected that are both consistent with the theoretical foundations of the research and have a high factor load. Due to the low operating factor, eight indicators have been removed from the model.

Cronbach's alpha and composite reliability statistics were used to evaluate the reliability and validity of the structure. Structures will be stable when each of these parameters is greater than 0.7. According to this criterion and calculations shown in Table (2), the measurements of all structures have the necessary validity and reliability in terms of all criteria. The mean statistic of variance extracted "AVE" shows the validity of the measurement of structures. According to this statistic, the measurement of each structure will be valid when its value is more than 0.5. According to the fifth column of Table 2, the measurements of all structures are valid.

Table 1: Operational definition of national innovation ecosystem components and research variables

Mark	Measurement index	Variable	Mark	Measurement index	Variable
IT1	Mobile SIM card subscription	Information Technology	IL1	University-industry research collaboration	Innovation interactions
IT2	Internet users		IL2	Cluster development status	
IT3	Fixed broadband internet subscription		IL3	Externally funded R&D expenditures	
IT4	International Broadband Internet		IL4	Strategic contracts and joint ventures	
IT5	Broadband mobile subscription		IL5	Patent families registered with at least two offices	
LS1	Hope for academic life	Learning community	KP1	Patent applications	Innovation production of knowledge
LS2	Quality of elementary education		KP2	Patent applications under the Patent Cooperation Agreement	
LS3	Gross enrollment rate in elementary education		KP3	Model operation requests	
LS4	The quality of the educational system		KP4	Scientific and technical publications	
LS5	Gross enrollment rate in elementary education		KP5	Index of citation able documents	
LS6	Extent of in-service training of employees		EF1	Business freedom	Economic freedom
LS7	Local access to specialized in-service training services		EF2	Labor freedom	
BE1	Tax rate as a percentage of profit	Business environment	EF3	Monetary freedom	
BE2	Number of procedures to start a business		EF4	Freedom of trade	
BE3	Number of days to start a business		EF5	freedom of investment	
BE4	Degree of customer orientation		EF6	Financial freedom	
BE5	Buyer progress		RE1	property rights	Legal environment
BF1	Access to financial services	Business financing	RE2	Intellectual property protection	
BF2	Financing through the local stock market		RE3	Judicial independence	
BF3	Ease of getting a loan		RE4	Efficiency of the legal framework in resolving disputes	
BF4	Existing venture capital		RE5	The effectiveness of the legal framework in challenging regulations	
KBI1	Adaptation of technology at the enterprise level	Absorption of knowledge	PE1	Elections in the decisions of government officials	Political environment
KBI2	Procurement of high-tech products by the government		PE2	Waste of government spending	
KBI3	Foreign investment and technology transfer		PE3	Load government regulations	
PRO1	Labor productivity	Total productivity	PE4	Transparency of government policy	
PRO2	Trust in specialized management		PE5	Government efficiency	
PRO3	Corporate board efficiency		SC1	Public trust in politicians	Social capital
PRO4	Auditing power and accounting standards		SC2	Reliability of police services	
PQ1	Quality local suppliers	Quality of products	SC3	Ethical behavior of companies	
PQ2	The nature of competitive advantage		SC4	Trust among the people	
PQ3	Value chain breadth		MS1	Intensity of local competition	Structure of the market
PQ4	Production process progress		MS2	Extent of market dominance	
INC1	Innovation capacity	Innovation capacity	MS3	The effectiveness of antitrust policy	
INC2	Quality of scientific and technical institutions		HC1	Inventory of engineers and scientists	Excellent human capital
INC3	Corporate spending on research and development		HC2	Gross enrollment rate in higher education	
INC4	Inventory of the latest technologies		HC3	Quality of science and engineering education	
			HC4	The country's capacity to retain talent	
			HC5	The country's capacity to attract talent	

Table 2: Reliability and Validity of the Structure

structure	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Higher Education	0/823	0/878	0/595
Factor efficiency	0/918	0/943	0/807
Entrepreneurship financing	0/935	0/954	0/837
Innovation interactions	0/837	0/892	0/678
production of knowledge	0/858	0/904	0/704
Learning community	0/908	0/927	0/652
Absorption of knowledge	0/747	0/885	0/794
Structure of the market	0/883	0/928	0/810
Social capital	0/940	0/962	0/894
Innovation capacity	0/961	0/972	0/896
Information Technology	0/872	0/913	0/729
Economic system	0/883	0/914	0/682
Legal system	0/979	0/983	0/921
Political system	0/957	0/967	0/853
Business dynamics	0/832	0/922	0/856
Quality of products	0/973	0/980	0/924

SmartPls3 software was used to evaluate the data, construct the model, estimate the relationships between the variables, and test the national business ecosystem model. The advantage of this software over other similar software is that it has the ability to estimate compatibility with low data. This software is programmed based on minor squares.

Research Findings

The key evaluation criteria of the structural model in "PLS-SEM" are: significance of path coefficients, value level "R^2", effect size "f^2", predictive relationship of "Q^2" to improve these criteria, model The theory has been estimated many times with independent and intermediate variables and various indicators (relevant obvious variables) and the necessary corrections (within the framework of theoretical foundations) have been made step by step. Therefore, the results reported in the article are the final results. The coefficient of determination or "R^2" in structural equations indicates how many percent of the changes in one latent variable (dependent or intermediate) are determined by other latent variables (intermediate or independent). This coefficient indicates that a set of latent variables (mediator or independent of research) together predict what percentage of the behavior of a latent variable (dependent or mediator). Table 3 shows that the outputs of the national business ecosystem, ie total factor productivity, product quality and innovation capacity, have a high coefficient of determination and are explained by more variables; Intermediate variables have a relatively low coefficient of determination because they are explained by a smaller number of variables. However, some intermediate variables (such as information technology) have a high coefficient of determination despite the number of less influential variables. The lowest coefficient is related to the economic system, which in the model is affected only by the political system.

Table 3: Explanation coefficients of hidden variables

R Square Adjusted	R Square	Variables
0/876	0/876	Higher Education
0/837	0/838	Factor efficiency
0/763	0/763	Entrepreneurship financing
0/829	0/829	Innovation interactions
0/466	0/466	production of knowledge
0/803	0/803	Learning community
0/850	0/850	Absorption of knowledge

R Square Adjusted	R Square	Variables
0/793	0/793	Structure of the market
0/923	0/923	Social capital
0/925	0/925	Innovation capacity
0/543	0/543	Information Technology
0/222	0/222	Economic system
0/797	0/797	Legal system
0/819	0/819	Business dynamics
0/932	0/932	Quality of products

The criterion "f 2" is used to measure the effect of deleting an independent or intermediate variable on another dependent or intermediate variable. The critical values of this criterion for small, medium and large effects are: 0.02, 0.15 and 0.35, respectively. According to this criterion, the size of the effect of the "political system" in determining the variables of learning society, social capital, legal system and economic system; The effect of economic system on information technology; The effect of knowledge production on innovation interactions; the effect of information technology on the learning community; And the impact of the learning community on higher education is tremendous. But the effects of higher education and social capital on other components of the national business ecosystem are small. Political and legal systems also have little effect on higher education. New knowledge, as one of the important outputs of universities, has a moderate impact on innovation capacity and product quality. The value of "Q2" is calculated as an indicator of the predictive power of the model. The values of 0.02, 0.15 and 0.35 for each of the endogenous structures indicate low, medium and strong predictive power, respectively. According to this criterion, the predictive power of the model is very strong for a weak economic system, for producing knowledge between moderate and strong, and for other variables. The "GOF" criterion is usually used to evaluate the goodness of the overall fit of the model. However, due to its weaknesses, it is not provided in Smart PLS 3 software outputs. Instead, the statistics of the saturated model and the estimated model (such as Chi-Do) are compared. A comparison of the statistics of the two models shows that they are very close to each other; so the model has a good fit.

In Smart PLS outputs, path coefficients are reported in three modes: direct, indirect and total. The direct coefficients in the output of this software show that except for the effect of knowledge absorption on knowledge production, which is negative, the coefficient of impact of other components of the national business ecosystem are positive. This means that the contexts, processes and capabilities of the national business ecosystem are likely to affect its outputs. However, more accurate probabilities can be obtained by examining the values of the "t" statistic on the relationships in Figure 1. As can be seen in this figure, most of the coefficients of impact of platforms, processes and capabilities on the outputs of the national business ecosystem are significant with a low probability of error (around 0.01 to 0.05). Only a small number of them (such as the effect of infrastructure on knowledge penetration and the effect of infrastructure on higher education) are significant with a probability of error above 0.1.

Indirect and total coefficients cannot be represented using path coefficient shapes. The table is used for this purpose. The research hypotheses can be tested using the table of total coefficients and the "t" statistic. According to the estimated model and direct effects, indirect effects and total effects, many hypotheses can be tested. According to the purpose of the research, here only hypotheses based on the variables of higher education, knowledge production and innovation interactions that are directly related to the activities of universities are tested. In order to better analyze the overall role of these processes in the development of national business ecosystem outputs, appropriate research hypotheses need to be tested based on total impact coefficients. The first column of Table 5 shows the hypotheses leading to the final three outputs of the national business ecosystem, namely total factor productivity, product quality, and innovation capacity. The second and third columns of this table show the coefficients of the total effect of a component on the outputs and the probability of error in estimating the coefficients, respectively. The final column of the table presents the test results of the hypotheses.
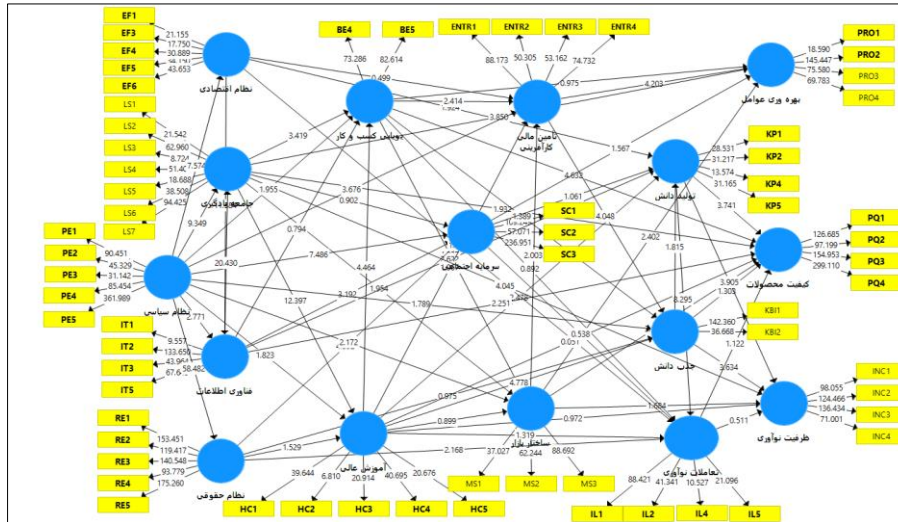
Figure 1: Direct path coefficients in the structural model of the national business ecosystem

Table 5: Test Results of Research Hypotheses

Hypotheses	P Values	Original Sample (O)	Test Results of Research Hypotheses
Higher Education -< Factor efficiency	0/001	0/194	Rejection of the null hypothesis
Higher Education -< Entrepreneurship financing	0/004	0/317	Rejection of the null hypothesis
Higher Education -< Innovation interactions	0/008	0/306	Rejection of the null hypothesis
Higher Education -< production of knowledge	0/049	0/297	Rejection of the null hypothesis
Higher Education -< Absorption of knowledge	0/000	0/481	Rejection of the null hypothesis
Higher Education -< Structure of the market	0/021	0/328	Rejection of the null hypothesis
Higher Education -< Innovation capacity	0/000	0/372	Rejection of the null hypothesis
Higher Education -< Business dynamics	0/000	0/432	Rejection of the null hypothesis
Higher Education -< Quality of products	0/000	0/330	Rejection of the null hypothesis
Innovation interactions -< Innovation capacity	0/610	0/031	Failure to reject the null hypothesis
Innovation interactions -< Quality of products	0/262	0/064	Failure to reject the null hypothesis
production of knowledge -< Innovation interactions	0/000	0/470	Rejection of the null hypothesis
production of knowledge -< Innovation capacity	0/000	0/232	Rejection of the null hypothesis
production of knowledge -< Quality of products	0/000	0/225	Rejection of the null hypothesis
Learning community -< Higher Education	0/000	0/631	Rejection of the null hypothesis
Learning community -< Innovation interactions	0/002	0/213	Rejection of the null hypothesis
Structure of the market -< Innovation interactions	0/233	-0/009	Failure to reject the null hypothesis
Structure of the market -< production of knowledge	0/264	-0/020	Failure to reject the null hypothesis
Social capital -< Innovation interactions	0/348	0/130	Failure to reject the null hypothesis
Information Technology -< Higher Education	0/000	0/423	Rejection of the null hypothesis
Information Technology -< Innovation interactions	0/000	0/287	Rejection of the null hypothesis
Information Technology -< production of knowledge	0/000	0/393	Rejection of the null hypothesis
Economic system -< Higher Education	0/000	0/264	Rejection of the null hypothesis
Economic system -< Innovation interactions	0/000	0/317	Rejection of the null hypothesis
Economic system -< production of knowledge	0/000	0/417	Rejection of the null hypothesis
Legal system -< Higher Education	0/127	0/189	Failure to reject the null hypothesis
Legal system -< Innovation interactions	0/000	0/357	Rejection of the null hypothesis
Legal system -< production of knowledge	0/247	0/081	Failure to reject the null hypothesis
Political system -< Higher Education	0/000	0/779	Rejection of the null hypothesis
Political system -< Innovation interactions	0/000	0/689	Rejection of the null hypothesis
Political system -< production of knowledge	0/000	0/453	Rejection of the null hypothesis
Business dynamics -< Innovation interactions	0/612	0/041	Failure to reject the null hypothesis
Business dynamics -< production of knowledge	0/131	-0/066	Failure to reject the null hypothesis

Rejection of these hypotheses means that in the context of the structural model of the national business ecosystem, and in the context of the measurement indicators presented in Table (1), higher education and knowledge production that are directly derived from the activities Universities emerge, affecting most of the intermediate components of the national business ecosystem. In contrast, only certain components of the national business ecosystem contribute to higher education, knowledge production, and innovation interactions. These components are: learning community, information technology, economic system and political system. Also, not rejecting the mentioned hypotheses means that within the framework of the structural model of the national business ecosystem, and within the framework of the measurement indicators presented in Table (1), innovation interactions contribute to outputs and intermediate components. The national ecosystem does not do business.

Discussion and conclusion
Theoretical analyzes and empirical findings show that competitive universities and higher education centers, as important actors and stakeholders of the knowledge-based business national ecosystem, are based on a dynamic learning community, free economic system and political system by helping to generate knowledge, accumulate human capital, accumulate social capital and innovate interactions with industry, government and civil society, help to promote the competitive advantage and competitiveness of businesses.

Research universities are the primary motivate of competitiveness and the infrastructure of an innovation-based economy.

By cultivating a skilled, knowledgeable and skilled workforce, they are the key determinants of the competitive advantage of businesses and the global competitiveness of countries. Since the current economy is based on knowledge, only nations that work scientifically will achieve economic progress.

In this regard only good quality and competitive universities and higher education institutions can be found in countries with an information and dynamic learning community. At the same time, businesses with a higher competitive advantage and competitive economy need to political system, free economy and effective legal system.

The competitive advantage of countries depends on creativity and scientific and technical innovations. In particular, from the perspective of the learning community (of which universities and higher education institutions are important actors), people are the basis of competitive advantage and competitiveness. Economies that have strengthened their laws to increase productivity, its people learn better and more than others; Are creative; And they produce innovation, entrepreneurship better than other nations, they have higher competitive advantages.

Because countries can copy technology and products; But they can not copy people. Common habits, behaviors, beliefs, missions, norms and symbols among the people of a country are also part of human capital. At such a time, nations will thrive to develop their citizens' knowledge to meet the needs of the day and to invest in a variety of specialized infrastructure that helps efficient trade.

As a result, in order for less developed economies such as the Iranian economy to move up the remaining steps of development and achieve a better competitiveness score, they need quality and competitive universities, Up through Educate skilled people and produce new knowledge to be able to perform creative, innovative and entrepreneurial activities.

But before that they need freer political and economic systems; It is necessary to reform their legal system in order to increase the effectiveness of protection and protection of intellectual property; And they need to build a dynamic learning and information community.

Policy proposals
The most important policy proposal that can be made based on this result is that the government increasingly builds a "national knowledge-based business ecosystem" based on a free and competitive economy, a free and democratic political system, an information society and dynamic learning. Make an effort. Because only in this way can it serve universities in the competitive advantage of businesses and national competitiveness. In order to develop the national business ecosystem, the government must improve the components of the national business ecosystem and modify its various dimensions as follows:

- Improving the country's business environment in order to simplify starting a business, facilitating the conditions for obtaining establishment and construction licenses, simplifying the registration of establishment and ownership, simplifying obtaining credits, improving investor protection, simplifying bankruptcy settlement, Simplify tax payments and simplify international trade.
- Building a learning community in order to improve the quality of public education, increase literacy rates, increase academic life expectancy, develop e-learning, promote online learning and train learning, creative, development-oriented, independent, law-abiding and responsible citizens;
- Liberalization of the economic system in five dimensions of foreign and domestic investment, labor market, liberalization of the currency and monetary system, freedom of domestic and foreign trade, and financial liberalization.
- Reforming the country's political system in order to liberalize and realize the components of good governance;
- Improving the legal and regulatory environment in order to improve the quality of laws and regulations, enhance the rule of law and increase the effectiveness of protection and protection of intellectual property.
- Improving the higher education system in order to increase the competitive advantage and competitiveness of the university: a university that produces good knowledge; Accumulates learner, creative, innovative and entrepreneurial human capital; and engages in innovative and entrepreneurial interactions

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