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ANALYSIS OF THE REGIONAL INNOVATION PERFORMANCE BY USING NORMALIZATION METHOD: TR1 (ISTANBUL) EXAMPLE

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Zeynep Karacor[1], Erhan Duman[2]
[1]Selcuk University, zkaraçor@selcuk.edu.tr
[2]Bitlis Eren University, eduman@beu.edu.tr

ABSTRACT

Today, economic decision-making units need resources that will provide and improve economical growth in order to increase social welfare and competition. Within the economical structure, these resources emerge with knowledge, technology and innovation. Particularly regional innovation systems play a central role in meeting the requirements for the resources needed for economic growth. For this reason, it is important to analyze the relationship of the innovation with the economic growth in the new world economy, where it appears like a production factor. In this study, the innovation performance capacity of the TR1 region has been investigated by using the normalization methods. In this framework, it is aimed to establish criteria that are comparable to the Level 1 averages of the regions in Turkey.

Keywords: Regional, innovation, innovation index, innovation efficiency and normalization method.
JEL Codes: O3, O4, R3

1. INTRODUCTION

The phenomenon of globalization continues to change the world every day with information, technology and innovation. For this reason, economic units, political environments, and social and cultural values that emerge in the process of globalization are becoming the parts of the system that develops. In this context, in today's world, where knowledge is vital, and keeping up with innovations in technology or catching up with innovations become tougher, economies have been highlighting innovation as an integral part of the growth. The point that the countries or regions, which aim to grow economically in this framework, agree is creating the infrastructure necessary for these policies, as well as closely following the scientific and technological advances regarding the innovation policies. In order to understand the importance of innovation in the social, cultural, political and economical system, this understanding must be brought to a status where it is dominant. Technology and knowledge, which have developed due to the necessities within the past centuries, have been the bases for the innovation policies of the 21st century. Innovation policies are defined as a new product-process starting from the invention, until the scientific and technological progress and afterwards gaining economic added value. The concept that covers all of this product and process researches is innovation. Innovation; while it constitutes the basis for the economic growth at one side, it is also an important variable for countries', regions' and companies' having competitive structures in the international market in the long-term on the other side. The variable of innovation is being examined extensively in studies on economic growth, and it facilitates the distribution of the information across sectors, as well as reducing growth differences between the regions. In this context, coordination and cooperation between the sectors in the regions increase with innovation. In this way, regions concentrate on research and development (R&D) activities, which will contribute to the improvement of innovation processes that is one of the driving forces of competition. In addition, innovation contributes to the development and growth of underdeveloped regions. Innovation in this case; is considered as a phenomenon that embodies social, cultural, political and economic changes and is seen as an essential element in increasing profit maximization and competitiveness of the companies. Many studies have been carried out to explain the concept of innovation in the history of economics. The reason for that is innovation's being in constant change. Therefore, expressing the concept of innovation as a technical word provides convenience for semantic integrity. Innovation, which is a Latin-based term, is derived from the word 'innovatus'. The dictionary meaning of innovation is starting to use new

methods in economic, social, cultural and administrative matters. According to this definition, innovation represents not only a process but also a result. In this context, the term is used for the innovations that have economical value. Therefore, formations that have the innovation characteristics for society and the economy should be in a commercial nature, contributing to an increase in prosperity. Regarding this definition, first of all, it is necessary to solve the contradiction in the terms of invention and innovation. Schumpeter has pointed out the difference between innovation and inventions. According to Schumpeter, developing the ideas of a product or manufacturing process for the first time is invention, whereas the innovation is the transformation of a new idea into an economic value for the first time. At the same time innovation is a result of knowledge accumulation, while the inventions, are a product of scientific activities, which do not always result in innovation. Hence, inventions do not have economic effects by themselves. The transformation of inventions into innovation, in other words, their commercialization, is related to personal talent, i.e. the entrepreneur. According to Schumpeter, everything that brings profits to the entrepreneur as a result of technological advances is defined as innovation. In this scope, the activities of innovation consist of creating a new market and production method, inventing a product and establishing production factors in order to provide raw material input. In this context, innovation is the discovery of a new form of production on a scientific standpoint, the discovery of a new product that has not been found out by producers and consumers before.

Another important factor in innovation is the positive relationship between regionalization, institutional infrastructure and economic growth. In order for this positive relationship to be formed, technological products and the information should be produced, marketed, organized and presented in different forms, and commercialized. In this case, innovation systems make a very important contribution to economic growth by increasing competitive capacity of the nations and regions. In this direction, institutions-organizations such as university-industry collaborations, R&D institutes, technoparks-technocities, development agencies and research centers play an important role both in national and regional sense in economic growth process. In addition, innovation systems are processes that lead to drastic changes in the economic, political and social structures of the regions. Therefore, the factors such as intensity of innovation activities, incentives for R&D expenditures, accessibility of institutions that have undertaken the task of supporting the entrepreneurship are very important in terms of the development of regions.

The questions that have been addressed regarding the purpose of the work are:

i. What is the innovation performance measurement capacity of the TR1 zone?
ii. Is the region productive in terms of innovation?
iii. What are the factors that influence the region that is related to innovation?

It is expected to contribute to the literature within the scope of the answers to these questions.

2. LITERATURE REVIEW

There are many empirical studies on innovations in the literature. These studies have been searching for the answers of the questions such as: “What are the determinants for the innovations at company, region and country level?”, “How is the level of innovation performance measured?”, and “Is innovation a process that enhances competition?”. For this reason, in addition to the studies examining the effects of the components of innovation performance measurement and index values on innovation outputs, the innovation subject is included in empirical studies in the context of economic growth and regional competition. Some of these studies are as follows. Jaffe (1989) examined the effects of university researches and private sector R&D expenditures on innovation in the US between the years of 1972 and 1981. Analyzes have been separated into three groups as medicine, chemistry and electricity sectors. At the end of the study; it was stated that, while there was a positive relationship between university researches and private sector R&D expenditures, the strongest relation belonged to the pharmaceutical sector. This relationship leads to an increase in innovation as a result of the increase in university researches and private sector R&D expenditures. Popp (1998) analyzed the relationship between innovation and energy prices in the US economy between the years of 1970 and 1994. In the study, the number of patents was included as a dependent variable, and the Energy prices, public sector spending on R&D and information stocks were independent variables;. The analysis has resulted in a positive and strong relationship between the variables. It was stated that the increase in the number of patents and the increase in energy prices were in the same direction. Porter and Stern (2001) conducted a study covering 75 countries to show the innovation index capacity at national level. The study also included the main activities, including countries' patents, innovation policy, clustering and innovation connections, and different sub-variables. Index values were calculated by using standardization method in the model where 24 variables such as public-private sector R&D investments, population structure, suppliers, university-industry cooperation, and number of scientists were used. After the index values were calculated, the innovation capacity index was established by taking the non-weighted averages of the 4 main sub-indexes. These variables in the study were subjected to regression analysis. 23 of the

24 variables were statistically significant. In the study Turkey is ranked as 44th with 17.8 points in the innovation capacity index.

Porter, Stern, and Furman (2002) also conducted a study on innovation determinants. They have defined the innovation determinants based on the knowledge-based internal growth model, the national innovation system, and Porter's theory of competition. It was emphasized that, although these models have many common aspects, they differ in terms of the factors. In the study; the information stock in economy and the number of employees working in R&D was analyzed with the theory of internal growth, the innovation's micro-economical aspects were analyzed with the theory of competition, and the national innovation system was used to analyze the roles of institutions in the countries, the national politics, and higher education systems. Huggins (2003) carried out an index study on the regions in UK between 1993 and 1999. In the study, four variables were analyzed: regional economic growth, innovation activities, competition development and the number of knowledge-based firms. As a result of the analysis, it was found that there was a strong correlation between the variables. Martin (2004), reviewed the factors affecting economic growth in 207 regions of Europe. In this context, the effects on economic growth within the components were estimated with Barro type convergence approach between 1980 and 2001. These components include; per capita national income, R&D expenditures, physical capital, share of high technology sectors in total employment, proportion of higher education students and external economies. Regionally, the effect of these expenditures on per capita national income and R&D expenditures are concluded to be significant. Hu and Mathews (2005) studied the determinants of the innovation capacity of the countries of Taiwan, China, Korea, Singapore and Hong-Kong between 1970 and 2000. In this study; they used the population, national income per capita, number of scientists, expenditure on research and development, risk capital market power, number of academic publications in magazines, capacity to protect the intellectual property, openness to international investment and trade, the frequency of the antitrust policies, and the GDP share of high education expenditures as independent variables. As a result of the analysis; it was found that the protection of intellectual property rights negatively affects innovation. They concluded that there was a positive relationship between the other variables and the innovation capacity.

Lenger (2008) conducted a survey on Level 1 regions of Nomenclature of Territorial Units for Statistics (NUTS) of Turkey covering the years between 1998 and 2005. Lenger analyzed the effects of patent applications, which is the determinant of innovation performance, on the utility model, the cooperation of the state universities in the regions with the industry, and the number of publications in the universities. In addition, the data of the research variables were analyzed with the Generalized Moments Method (GMM). As a result of the analysis, it was found that there was a positive and strong effect between the patent and the other variables. Wonglimpiyarat (2010) tried to find the index of innovation capacity with components related to organization, process, service, and product and marketing innovation throughout Thailand. Under the main headings of "human capital", "infrastructure" and "innovation climate" in the study, the data regarding the variables were collected with the help of a questionnaire. The survey results were adapted to the index values between 0 and 4 points. As a result of the survey, the general index value of 2.3 points has been obtained and it has been found that Thailand has a moderate level of innovation capacity. Annoni and Kozovska (2010) calculated the European regional competition index. In their calculations, they used the normalization method in the "matlab" program. They sought answers to the question of "Why it is so important to measure regional competitiveness in EU regional competitiveness index calculations?". Index calculations have been made up of three variables. These are; education, macro-economic stability and infrastructure. These variables consist of 69 components. In the analyzes, it was concluded that, macroeconomic stability is the most important factor affecting the regional competition index.

Fritsch and Slavtchev (2011) examined the information production function in 93 regions in East and West Germany within the regional innovation system. They analyzed the relationship of regional patent applications, which were considered as outputs, with the variables such as research institutes, population density, funds allocated to university academic staff, employment in the sectors of service-transportation-electricity-chemistry, average employment and number of private sector R&D professionals, in the study covering 1995-2000 period. In the results of this study; the effects of average employment per institution and service sector employment variables on patent applications were significant and negative, while the effects of other variables on patent applications were positive and significant. Slaper et al. (2011) examined the relationship between regional innovation performance and economic growth. This work, which was based on 3110 residential areas in the USA, consisted of two parts. In the first part, to determine the regional innovation performance and capacity, regional innovation index was created by using the variables of the number of SMEs (small and medium sized enterprises), patents, private sector R&D expenditures, the ratio of the number of the license/associate's degree graduates to the population, the ratio of the risk capital to the investment, the infrastructure, employment structure in the high-tech industries belonging to the years between 1997 and 2006. The first part forms the input variable of the second part at the same time. In the second part of the study, the innovation outputs of the regions and the possible effects of their performances on the economic growth were analyzed by econometric method. As a result of analysis; it has been found

that there are positive and significant effects between the number of SMEs, private sector expenditures, number of patents, infrastructure, and economic growth in advanced technology industries.

Gömleksiz (2012), calculated the innovation index of NUTS Level 2 regions in Turkey. In the study carried out by minimum-maximum normalization method considering global index sub-variables, the innovation inputs consisted of human capital-education, infrastructure-culture, market development and business environment. Innovation outputs were consisted of prosperity, and the creative and scientific outputs. All these sub-variables were examined within 45 components. Asheim et al. (2013) investigated the effects of public policy on regional innovation. In this research, they pointed out that it has important effects on the regional innovation system in the culture variable, like industrial information intensive products. However, they argued that these influences were hindered by public policy intervention in terms of scientific framework. In their study, they pointed out that a new regional innovation system approach will create a policy for regional advantages.

3. DATA AND METHODOLOGY

In the development of regional innovation indexes, NUTS indicators have been examined within the scope of the development of data, in a way that is consistent with the EU, and some variables that are discussed in the literature have been determined. These variables, which are examined under innovation inputs and outputs, consist of human, economic, social and structural variables. In this context innovation inputs consist of main variables such as; enablers, infrastructure-culture and entrepreneurship-trade. Sub-variables forming these main variables are; human resources, research systems, investments-loans-supports, population, energy, information communication technologies, health, transportation, culture, entrepreneurship, trade and financial intermediaries. In addition, these sub-variables consist of 48 components. Innovation outputs are listed as 4 sub-variables such as; innovations, scientific outputs, economical outputs and social welfare. These sub-outputs also consist of from 20 components. In the creation of the index variables, the information belonging to the components was collected based on the last available year. The information collected in this framework covers the period between 2009 and 2016. The collected data are basically obtained from reports, bulletins and databases published by organizations such as the Turkish Statistical Institute (TURKSTAT), Ministries, Program for International Student Assessment (PISA), Higher Education Council (Yüksek Öğretim Kurumu - YÖK), Turkish Banks Association (Türkiye Bankalar Birliği - TBB), Turkish Patent Institute (TPE) and University Ranking by Academic Performance (URAP). The general framework of these index variables is shown in Table 1.

Table 1: TR1 Of Regional Innovation Index Variables

1.Possible Sword	Data Source	Accessed Last Year
1.1. Human Resources		
1.1.1. Number of teachers per student in primary and secondary schools	TSI	2015
1.1.2. Sharp enrolment ratio in secondary education	TSI	2015
1.1.3. The number of 1000 per capita high school or equivalent vocational school graduates	MONE	2015
1.1.4. Science- math and reading in the areas of success rates	PISA	2016
1.1.5. 1000 per inhabitants higher education graduates	HEC	2015-2016
1.1.6. Number per 1000 of labor force by educational attainment	TSI	2015
1.1.7. The rate of higher education graduates in the total workforce	TSI	2015
1.2. Research Systems		
1.2.1. R & D manpower (public - commercial and higher education)	TSI	2015
1.2.2. The number of 10.000- employee per-capita staff researcher	TSI	2015
1.2.3 The number of 10,000-per-employee R & D personnel	TSI	2015
1.3. Investment, Credit and Supports		
1.3.1. GDP per capita R & D in the distribution of expenditures(thousand TL)	TSI	2015
1.3.2. Total public investments per capita (TL thousand)	MOD	2015
1.3.3. Total private investments per capita (TL thousand)	MOD	2015
1.3.4. Regional SME investment support (%)	MOE	2015
1.3.5. The total credit per capita (Specialization+Non-specialization TL million)	BAOT	2015
1.3.6. The number of technology development zones and centers	MOE-MOSIT	2015
1.4. Population		
1.4.1. Urban population growth rates (%)	TSI	2015
1.4.2. The dependency ratio of the population 0-14 years of age	TSI	2015
1.4.3. Population 65 years and over dependency ratio	TSI	2015
1.4.4. Sharp migration rate (%)	TSI	2015
2. Infrastructure and culture:		
2.1. Energy		

2.1.1. Total electricity consumption per capita (kWh)	TSI	2015
2.1.2.Green energy production per capita (kwh, power+thermal)	TSI	2005
2.2. Information Communication Technology		
2.2.1. Computer and internet usage rate (%)	TSI	2015
2.2.2. Internet access rate in households (%)	TSI	2015
2.3. Health		
2.3.1. Family physician number of patients per active employee	MOH	2015
2.3.2. Total number of physicians per 100.000 people	TSI	2015
2.3.3. Total number of hospital beds per 1.000.000 people	TSI	2015
2.3.4. The number of cases per ambulance-112 emergency aid	MOH	2015
2.4. Transportation		
2.4.1. Total road Length (km)	TSI	2015
2.4.2. The total number of vehicles	TSI	2015
2.4.3. Number of deaths in traffic accidents per 1,000,000 people	TSI	2015
2.4.4. Total number of passengers that use the airway	TSI	2015
2.5. Culture		
2.5.1. Number of person per movies	MOCAT	2015
2.5.2. Number of people per Theatre Show	MOCAT	2015
2.5.3. Number of public libraries per 1,000 people from benefiting	MOCAT	2015
3. Entrepreneurship and Trade:		
3.1. Entrepreneurship		
3.1.1. The number of venture total business according to the records	TSI	2015
3.1.2. The number of total established companies and cooperatives	TSI	2009
3.1.3. The total number of liquidated companies	TSI	2009
3.1.4. The share of the manufacturing sector in total attempts	TSI	2015
3.1.5. The share of information and communication sector's total attempts	TSI	2015
3.1.6. The share total attempts in professional scientific and technical activities	TSI	2015
3.1.7. The share total attempts to share educational activities	TSI	2015
3.2. Trade and Financial Intermediary Institutions		
3.2.1. Exports per capita (US $)	TSI	2015
3.2.2. Imports per capita (US $)	TSI	2015
3.2.3. In the manufacturing sector exports (US $)	TSI	2015
3.2.4. In the manufacturing sector imports (US $)	TSI	2015
3.2.5 Number of units in financial at local services	TSI	2015
3.2.6. The number of credit organizations of local units	TSI	2015
4.Innovation Outputs: **4.1. Innovations**		
4.1.1. Technological innovation initiative in economic activity total (%)	TSI	2008-2010
4.1.2. Total of economic activity initiative of product-process innovation (%)	TSI	2012-2014
4.1.3.Total economic activity initiative of the organization-marketing innovation (%)	TSI	2012-2014
4.1.4. Total economic activity initiatives in ongoing innovation (%)	TSI	2012-2014
4.2 Economic Output		
4.2.1. Total registered according to the number utility model	TPI	2015
4.2.2. Total registered according to the number patents	TPI	2015
4.2.3. Total registration according to the number industrial design	TPI	2015
4.2.4. Total registered according to the number brand	TPI	2015
4.3. Scientific Outputs		
4.3.1. The number of publications per capita 1.000.000	TSI	2013
4.3.2. An average of total points article	URAP	2015-2016
4.3.3. An average of total points cited	URAP	2015-2016
4.3.4. An average of total points scientific document	URAP	2015-2016
4.3.5. The average score of doctoral students	URAP	2015-2016
4.3.6. An average points of Lecturer / student	URAP	2015-2016
4.3.7. Total academic scores in the region of the University	URAP	2015-2016
4.4. Social Welfare		
4.4.1. According to expenditure groups general purchasing power parity	TSI	2012
4.4.2. The value added produced per labor	TSI	2011
4.4.3. The whole family level of happiness	TSI	2013
4.4.4. The whole family level of hopefulness	TSI	2013
4.4.5. Median income% 60 of 1.000 per capita the number of poor people	TSI	2014

A total of 68 components belonging to 15 sub-variables in 4 basic variables belonging to innovation inputs and outputs are shown in the Table. Even though the data for these components are composed of different level groups (Level 1, Level 2, and Level 3), whole of the data are combined within Level 1.

The Turkish averages and the variables belonging to the TR1 region are divided into two groups as basic and sub-variables. The basic variables are the outputs of: enablers, infrastructure- culture, entrepreneurship-trade and innovation. The sub-variables are: human resources, research systems, investments-loans-support, population, energy, information communication technologies, health, transportation, culture, entrepreneurship, trade and financial intermediary institutions, innovations, scientific outputs, economic outputs, and social prosperity. The data for all these variables will be examined below, using the minimum and maximum normalization method.

In the creation of regional innovation indexes in Turkey, the European innovation scoreboard and the method of normalization, which is a measure of regional innovation, have been used. The factors affecting the formation of regional innovation indexes and the effects of these factors on the regions have been examined. In this context, the factors affecting the regions are analyzed by normalization method (minimum-maximum). Additionally, this method is preferred, due to the reason that the regions will be able to be compared with each other. The index values for each given region, and innovation input and output variables are calculated by the normalization method, which is a standardization process.

Market actors have to analyze the dynamic market structure in their decision-making processes. Within this structure, many alternatives should be examined and comparisons should be made by evaluating these alternatives. This leads to the development of very different decision making methods within the dynamic structure. The normalization techniques are utilized in the analysis of the components with different variables. When the studies done with this method are examined, it is seen that the normalization methods are preferred (Wang et al., 2009: 2272).

Minimum-maximum normalization method is a generalized standardization process that is used to construct regional innovation indexes. Each component of the examined variables is used to generate the index values of the regions. These index values are in the range of 0 to 1 point interval according to minimum-maximum normalization method within the components (Aydın, 2012: 4-22). These regions that are mentioned are ranked according to their averages of general index score. The equation for the minimum-maximum normalization method is shown below.

In the equation;

xi ; is the numerical value of the regions within the group where the index value will be calculated

xmin. ; is the minimum value in each group

xmax; refers to the maximum value in each group.

Regional Innovation Efficiency = Innovation Output Average/Innovation Input Average

Index values for each region are calculated by dividing the difference between the group value belonging to the region and the minimum value in the group by the difference between the maximum value and the minimum value in the group. Regions with high innovation performance have the value of 1 and values close to 1; while those with low innovation performance have the value of 0 and values close to 0 (Çakır, 2012: 10-11). Additionally, the indexes of innovation and productivity of the regions are presented in the findings.

4. FINDINGS AND DISCUSSIONS

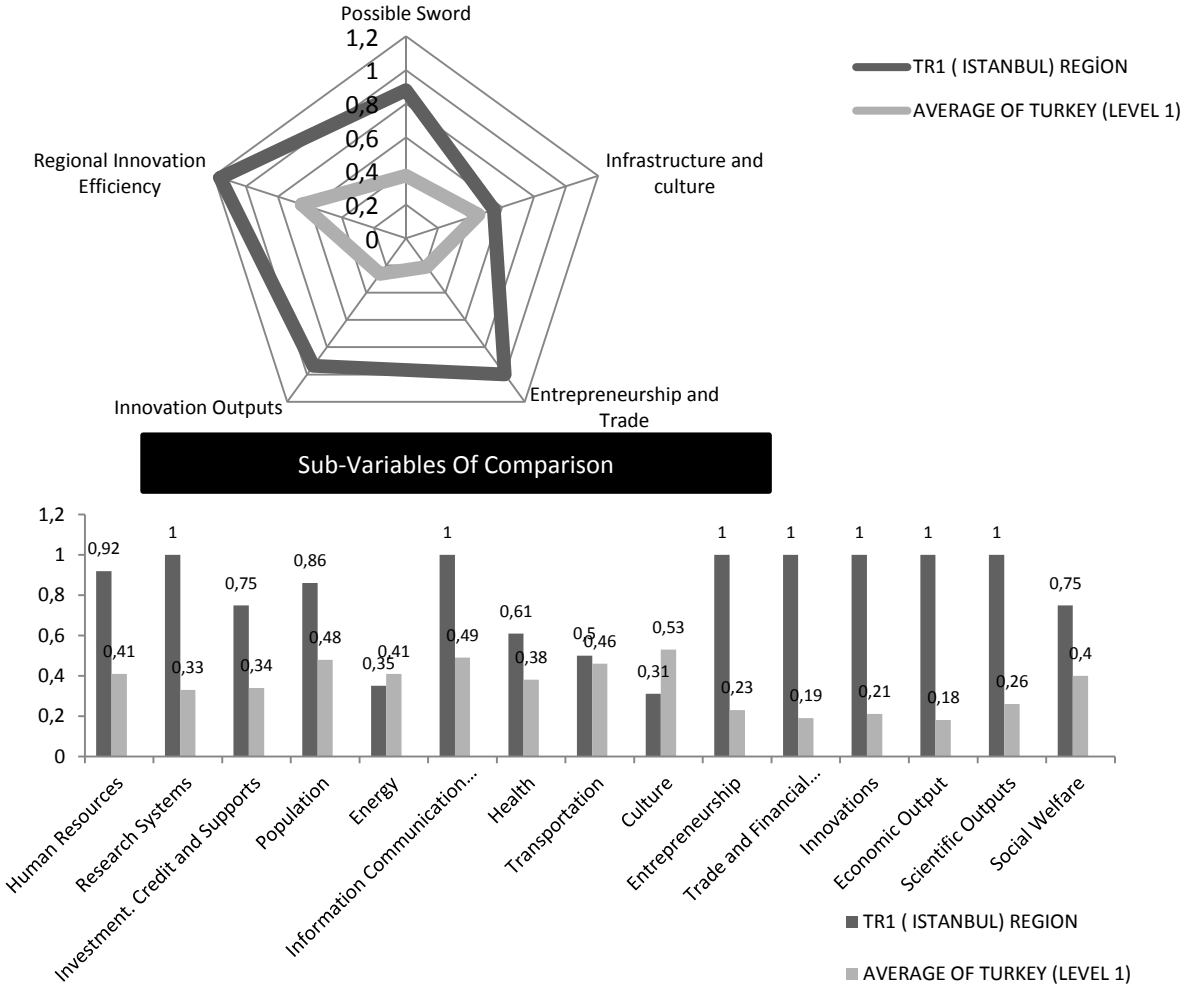
In the Table, regional innovation indexes and productivity scores are presented according to the minimum-maximum method. The ranking in the Table is based on the overall score averages. According to the calculations, TR1 (Istanbul) region's average index score and productivity score rankings are considerably higher than the average of Turkey.

Table 2: The Data of Minimum - Maximum Normalization Method

VARIABLES (LEVEL 1)	TR1 (ISTANBUL) REGION	AVERAGE OF TURKEY
1.Possible Sword	**0.88**	**0.3725**
1.1. Human Resources	0.918649474	0.41
1.2.Research Systems	1	0.33
1.3. Investment. Credit and Supports	0.745515303	0.34
1.4. Population	0.858950291	0.48
2. Infrastructure and culture:	**0.55**	**0.454**
2.1. Energy	0.345384127	0.41
2.2. Information Communication Technology	1	0.49

2.3. Health	0.612847222	0.38
2.4. Transportation	0.5	0.46
2.5. Culture	0.308855292	0.53
3. Entrepreneurship and Trade:	**1**	**0.21**
3.1. Entrepreneurship	1	0.23
3.2. Trade and Financial İntermediary İnstitutions	1	0.19
4.Innovation Outputs:	**0.9375**	**0.2625**
4.1. Innovations	1	0.21
4.2 Economic Output	1	0.18
4.3. Scientific Outputs	1	0.26
4.4. Social Welfare	0.753586636	0.4
Regional Innovation Efficiency	**1.16**	**0.65**

Figure 1: Turkey And TR1 Region Belong to That Comparison Of Variables



The Istanbul Region is on the top when ranked with minimum-maximum normalization method in Level 1 in terms of general, productivity and many other sub-variable indexes. The TR1 region needs to be developed in the infrastructure-culture input variable, from the innovation input variables, while it is in the forefront especially in the variables of enablers and entrepreneurship-trade. Moreover, it is above Turkey's average in the sub-variables of input, especially in human resources, research systems, investments-loans-supports, population, information communication technologies, health, entrepreneurship and trade-financial intermediaries. In the context of innovation outputs, the TR1 region is the leader in; innovations (In the entrepreneurships where the, technological, product-process, organizational-marketing innovations and

innovation activities continue in terms of total economic activities), economic outputs (utility models, patents, designs and number of brands according to total registration numbers), scientific outputs (Number of publications per million people, articles, citations, scientific documents, doctoral students and in the average academic point averages of the universities), social prosperity (the general purchasing power parity according to expenditure groups, the value added production per labor and the level of prosperity of the whole family), and in all of the other sub-component outputs. In this direction, it is in the higher class in terms of innovation. It is necessary to determine policies for energy, culture and transportation from infrastructure-culture input variables. Development of sub-variables in the middle ranks is important for the region, depending on investment, trade and entrepreneurship activities. Especially, it can be said that the presence of neighboring regions with heavy industrial density is effective in the energy sub-variable. In this context, the efficient use of energy resources and energy savings are important in terms of costs in the production phases for the region. In order for economic growth in Turkey to have a stable structure, the improvement of especially entrepreneurship, trade, innovation, economic and scientific outputs, from the sub-variables, will contribute to making the Turkish economy more dynamic. Particularly regional or national policies to be implemented for the development of skilled labor can be increased by Turkey's keeping its economic growth and international competitiveness continuous. In addition, the investments to be made in research centers with the university-industry cooperation within the regions are very important. Supporting entrepreneurship and commercial sectors in the context of R&D activities can provide a solid boost to regional innovation performance, because the entrepreneurial factor plays a key role in the innovation process. In other words, entrepreneurship will have a direct impact on enhancing regional innovation performance. In this case, goods and services with high added values can be produced and branding can be provided within economic sectors. Additionally, the reason for the culture, from the sub-variables, to be higher is the components. In this context, healthier results can be obtained in the calculation of innovation index if different components of culture sub-variable can be created (i.e. social capital and confidence index).

5. CONCLUSION

In the era of the information economy, countries and regions have adopted the innovation approach for the economic growth. This approach is based on the production processes that are differentiated within the capitalist economic system, the infinite needs of consumer societies, and the needs of innovation in production processes. In this context, it is important to evaluate the relations among many economic, social and humanitarian structural factors, which operate within the innovation approach. The prerequisite for Turkey's achieving sustainable economic growth is the development of regional innovation policies. In this study, 15 sub-variables in the regional innovation system and a total of 68 components belonging to these variables were analyzed in the context of Turkish NUTS Level 1 with a certain innovation input-output table. In this framework, this input-output model, which influenced regional innovation and economic growth, was examined by using normalization method. In this case, institutions and organizations need to prepare plans according to their regional characteristics in order to produce high value added goods and services in economic sectors and to provide branding. In this direction, measurement of performance between sub-variables of human resources, research systems, investments-loans-supports, population, energy, information communication technologies, health, transportation, culture, entrepreneurship, trade-financial intermediaries, innovations, economic and scientific outputs and social prosperity in the regional innovation system carries importance for the regions. This is because of the fact that the sub-variables are important competition factors in both economic growth and the innovation system. These factors, which affect the national and regional competitive superiority, also affect the economic growth in a positive way with the rapid development of the technology. In addition, when the population living in the regions believes that innovation is an indispensable element in terms of economic growth and turning it into a culture will positively affect the regional innovation.

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