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THE CREATIVITY FUNCTION OF PROVINCES: AN ASSESSMENT FOR THE PROVINCES OF TURKEY*

Ömer ŞEN**

Abstract

Creative provinces are largely composed of people who are able to make free decisions, have a high level of education, and are engaged in solving quite complex problems. In this study, Florida et al. (2008) using the "Global Creativity Index" developed by him, the creativity level of the provinces of Turkey was calculated and the results were evaluated with a spatial focus. According to the creativity index, the most creative province of Turkey is Kocaeli. Kocaeli is followed by Ankara and Isparta. The provinces with the lowest Creativity value are Hakkâri, Şırnak and Mardin. It is seen that the nearby provinces of Ankara, Kocaeli and Istanbul, which have high creativity index values, also have high values. Although it is observed that important steps have been taken in the field of creative provinces in Turkey, it is thought that a much faster path can be taken in the coordination of a more organized superstructure.

Keywords: Urban Geography, Creativity, Creativity Function of Provinces, Turkey

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** Assist. Prof., Gaziantep University, omersen@gantep.edu.tr

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INTRODUCTION

Cities are "*extraordinary works of human creativity*" that established civilizations along with changing and transforming humanity during the genetic process (Bookchin, 1992). Since the appearance of cities, such changes and transformations are closely related to their functional characteristics. Cities are places that can impact their immediate surroundings and regions in various ways, have various functions emerging with the common effects of their general characters and functions and these diverse functions are the main determinants of the city (Tümertekin, 1973; Göney, 1995; Weber, 2000; Keleş, 2010). Cities have historically fulfilled a number of purposes ranging from military, religious, political, commercial, symbolic and to cultural, depending on the history and geography of their establishment and transformation, furthermore, similarly, urban scale has reflected certain social geographies and histories (Doğanay, 1986; Smith, 2002; Aliağaoğlu & Uğur, 2012).

In a world experiencing a rapid post-globalization period, it can be stated that geographical advantages and classical functions of urban settlements are still an important defence point. However, for the growth and development stages of today's cities there exists other competitiveness variables. In order to attract physical and human capital globally, cities have entered into a different infrastructure compared to the past. Thanks to the realization of the effect of knowledge and brain power on urban functions, new approaches are needed to explain the urban development (Moore Cherry, 2015). In this period that knowledge and innovation are at the forefront, actors working on urban development bring these two elements to the attention for the development of cities. "Creativity", as the result of knowledge and innovation, is increasingly becoming a main title instead of a sub-title in the production processes of large companies and medium-sized companies. In broader terms, there has been a rapid increase in the demand for creatively thinking people with problem-solving skills, from engineers to artists and even managers (Andersson & Andersson, 2015).

Creativity refers to the formulation of new ideas and their application to produce original works of art, cultural products, functional creations, scientific discoveries and technological innovations (United Nations Conference on Trade and Development, 2008). Considering cities with functional perspective, it can be said that today's most prominent cities stand out with their creative features. Creative functions are rapidly gaining a place in urban functions as an objectified phenomenon of the knowledge-society-centered world. Urban cultural life, quality of a space, sectoral growths in culture and creativity are hot topics among academicians and practitioners of urban development. In this context, cities create a diverse and open environment for creative-knowledge workers, so, cities that are most successful in providing the environment are expected to be winners of economic development game in the future (Thiel, 2017).

Creativity, knowledge and access to knowledge are characterized as engines that accelerate economic growth and they promote economic development in a globalizing world (Memişoğlu & Kalağan, 2017). Creative cities are based on human capital and not physical capital. This creative class of individuals interested in science, arts, and cultural activities consists of people who are trying to solve highly complex problems that necessitates the ability of freely deciding, high education and human capital according to the definition of Florida (2012). Locational preferences of creative class is not only determined by availability of advanced-level jobs within the economic concerns. The other factor impacting the distribution of this class is the presence of an environment for free self-expression despite the cultural, racial, ethnic, and gender-based differences. These factors that affect the geographical distribution of creative individuals are crucial in two aspects. First of all, it will be easier for people to be accepted in such environments without abandoning their identity, and secondly, tolerance and open-mindedness has the potential to result in diversity (Doğrul & Çelikkol, 2017). Creative cities have to build an ecosystem of urban creativity with socio-cultural roots to attract the creative class. In the global creativity index, these parameters are shortened as 3T which are technology, talent and tolerance. While the first two of these are important components of new urban growth, tolerance for a range of cultural and lifestyle choices is seen as a critical element in attracting the talent needed to create success, and Florida argues that cities cannot compete successfully without all three components (Moore-Cherry, 2015).

The study begins with the "Introduction" section, where the importance of cities and the role of traditional functions in urban development are mentioned. Moreover, in this section, the main framework of the creativity functions of cities is drawn,

which has an important place in today's approach of cities. In the second part, previous studies on the subject are examined and the place and novelty of this study in the literature are mentioned. The third part, in which the data and method used in the study are explained in detail, is followed by the "Findings" part, where the findings obtained from the study are explained in junction with the literature. In the last section, the results obtained from the study are discussed.

RELATED LITERATURE

Attraction of cities for a certain population who are creative is not a new phenomenon. The Athens of Ancient Greece, Alexandria of Alexander the Great, Istanbul of the Mehmed the Conqueror Period or Florence of the Medici Period can be given as examples. However, in today's world, as its is explained in Andersson and Andersson's (2015), many cities with more compact creative possibilities exists rather than a sole city where all the creative paths converge on.

First systematic introduction to the creative city literature can be considered Jacop (1961). In his study "The Death and Life of Great American Cities", he points out that the diversity of creativity functions in cities has profitable results, through the question of what are the processes that decline or renew and strengthen cities. He adds that creativity will produce more effective results than expertise.

Although Schumpter (1934) pointed out the importance of innovation in economic development in his work "Theory of Economic Development", he did not include innovation in the basic process of production. Likewise, after the Second World War, there has been an important accumulation of literature on the effect of human capital on the economic growth of places at various geographical scales (Ullman, 1958; Schultz, 1962; Bowman & Myers, 1967; Mincer, 1970). Thus, "Human Capital Theory" has gained an important place directly in the development literature and indirectly in the creative cities literature (Doğrul et. al., 2016).

The foundations of the current studies on creative cities begin in the 1980s. Anderson, (1985); Lucas, (1988); Romer, (1990); Hall (2000) argued that the main driving-force of regional and urban development is the production that accumulated earnings made through the clustering of human capital.

The process of addressing the concept of the creative city on a broader basis begins in the 1990s. Indeed, Marthur (1999), states in his study that "an individual's human capital increases not only his own productivity but also the productivity of other workers of any skill level, so in the presence of this external effect, the growth rate will be higher in regions that invest more in human capital accumulation". This situation also coincides in some sense with Adam Smith's concept of the invisible hand of the market. (Smith, 1941). However, Black & Henderson (1997), Glaeser (2000), Seçilmiş (2015) provide empirical evidence for the relationships between human capital and creativity, and point to strong relationships between human capital and regional and urban growth.

Studies on the factors that shape the economic geography of creative cities are even lesser. Florida (2002), suggests that the reason of rarity those studies is the perspective of social scientists and geographers on economic geography of talents as a function of employment availability and financial incentives. Despite this, studies on geographical distribution of creative class and human capital in a broader sense do exists in 2000s (Lloyd & Clark, 2001; Florida & Gates, 2001; Florida, 2002a; 2002b; 2002c; 2005a; 2005b; 2006; Marlet & Woerkens, 2007; Markusen, 2004; Berry & Glaeser, 2005; Inglehart & Welzel, 2005; Mellander & Florida, 2007; Florida et al., 2008; Doğrul & Çelikkol, 2017).

Florida and Landry, two of the most prominent representatives of the creative class and creative city concepts, have made significant contributions to the relevant literature. Florida (2002, 2006, 2012) connects the creative class with spatial location in their studies. Landry (2000), also states that every city has a creative potential, but it becomes stagnant with time. Moreover, he also argues that non-physical infrastructure should be considered as importance as physical infrastructure in the development of cities, so that the creative cities will emerge, nurture and retain the creative class and bring an institutional mobility to the city (Landry, 2012).

When we considering studies of the relevant literature that focus on Turkey, Keyman & Lorasdağı (2010), interprets the capital-space dialectic in a three-dimensional model. Second dimension of this model that focuses on Competition – Entrepreneurship reveals that the most crucial features of a potential city are human capital, R&D capabilities, innovation, and interest of urban politicians on creativity.

In their study where they developed an index for evaluating the creativity potential of cities, Çetindamar & Günsel (2012), compared nine global cities with Istanbul in the center. They concluded that Istanbul is has a growing environment of innovation, however, R&D infrastructure, technical support and investments in higher education is still inadequate.

In Kaymas (2020), aims to rethink the culture-based entrepreneurship transformed within the creative industries within the creative ecosystem of Turkey and it states that the bond to be established between the creative class and space has a great meaning and that today's cities can be renewed as much as their place in the creativity ecosystem within the digital based information society. In this regard, localization economies support innovation, as well as urbanization economies have an important role in terms of innovation (Şahin & Altuğ, 2017).

Empirical studies also exists in Turkish literature. Lazzeretti, Capone & Secilmis (2014), discusses the role of the creative economy with considering the framework of innovation and economic growth in their studies that aims to investigate the structure of the creative and cultural sectors in Turkey. According to the results obtained by the concentration coefficient analysis, they found that the national economic contribution of the creative industries remained low due to the importance attributed to the traditional sectors.

Studies on creativity are increasing in developing countries such as Turkey that want to develop by taking a larger share in the global economy. These works focus on certain factors that bring about creativity, and they seek to assess creative capacity at the national, regional and municipal levels to suggest policies for their enhancement (Kumral,2010)

In Seçilmis (2015), study focusing on the clustering of creative industries in Turkey through the perspective of economic geography that covers 81 cities and measuring concentration coefficient analysis of them, the conclusion was that the assumption that creative industries tend to cluster in big cities is not valid for Turkey.

Doğrul et. al. (2016), study titled as "The Effect of Creative Class on the Economic Development of Provinces: The Case of Turkey" focuses on the relations between human capital and regional economic development with structural equation modelling and path analysis, and approved Florida's theory of high-creativity endorsing regional economic development.

In Esen & Atay (2020) empirical study performed on the scale of Turkish cities, they identified the creative cities of Turkey and claimed that if the creativity potential of the cities increases, their development will also improve, which will in the end, contribute to Turkey's development.

As can be seen in the related literature mentioned above, there are two main pillars of the studies on creative cities. The first category of studies are the ones focusing on the cultural and human capital-oriented development and status of creative cities. The second category consists of broader-based studies that also includes the first category and focuses on economic geography-based growth and development. It is seen that the studies focusing either on creative class or on creative cities are increasingly theoretical and empirical. Interest in the estimation of creativity with indices has been increasing in recent years, not only for regional marketing purposes, but also because they provide analytical tools for assessing the economic impact of the creative economy and their usefulness for measuring the effectiveness of political decisions (Correia & Costa, 2014).

What makes this study novel and valuable in the literature can be explained as follows: Each sub-component of the method used for estimating the creativity function of Turkish cities evaluated independently. Additionally, mapping of the results and modelling of them with a geographical perspective is another source of originality. It is thought that this study will contribute to the prior literature with its unique interpretation of Turkey example, it will also be a source of preliminary outcomes for future studies. Moreover, this study has the potential to contribute explanation of differences in the levels of development among cities.

DATA AND METHOD

The creativity index is a statistical measurement that allows for identification of the factors that support the creativity of a region, city or a society (Esen & Yıldırım, 2018). The creativity index can be utilized on the basis of country, region and city scale with a number of different indicators. As a result of the increasing awareness of the contribution of creativity to the socio-economic development of spaces of various geographical dimensions, many different creativity indexes have been developed.

In this study, it is aimed to measure the creativeness of Turkey's cities with the Global Creativity Index and to evaluate the results. For this main objective, the evaluation of each sub-component of components during the measurement of creativeness in Turkish provinces constitutes the novelty of the study. In addition, discovering the relation of the results to the space is another purpose which has never shown before can be considered as an additional novelty of the study.

Florida's Creative Cities Index (Florida, 2003), Hong Kong Creativity Index (Hong Kong Creative Indeks, 2004), Creative Communities Index (Creatıve Communities Index, 2005), Composite Index of Creative Economy (Bowen et al., 2006), Czech Creativity Index (Kloudova & Stehlikova, 2007), Creative City Index (J-Creative City Index, 2008), European Creativity Index (European Creative Index, 2009), Baltimore Creativity Index (Acs & Megyesi, 2009), Global Creativity Index (Global Creative Index, Florida et al., 2011) can be used as examples to them.

In this study, The Global Creativity Index (GCI) developed by Florida et al. was used. The index is determined according to 3T (Technology-Talent-Tolerance) components (Figure 1). Each component also has sub-components, and each component emerges by calculating the sub-components all-together. This is crucial for coming up with a large sub-data network with all sub-components. Ultimately, the results of all three components converge on the Creativity Index.

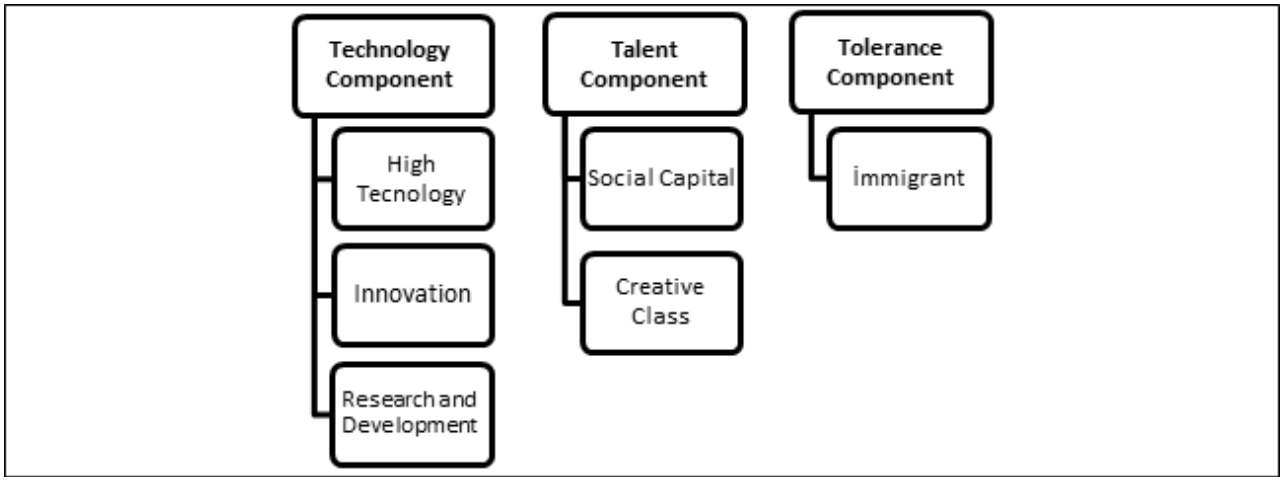

Figure 1: Creativity Index Components

The reason for choice of the index used in this study is its ability to provide ranking and comparison opportunities for decision makers, especially in cities. In addition, all of the current indexes on creative cities are based on the Creative Capital Theory developed by Florida and they are widely utilized. Although the index used in this study is common, it has some limitations. The criticisms made according to these limitations, generally, are the ambiguity experienced in the determination of the high technology class used in the index (Markusen, 2006; Pratt, 2008; Esen & Yıldırım, 2018), definition of the creative class is restricted to occupations and consideration of urban growth not only the size of the creative class but also educational features matter (Rausch & Negrey, 2006).

However, the Bohemian Index, which Florida included in its late work, was not included. The reason for this is that there are many criticisms on this subject and the ambiguity of this field. For example, Moore-Cherry (2015) mentions that there are

many different occupational groups under the umbrella of the creative class. He states that in order to reach a meaningful conclusion about the economic effects, this concept needs to be decomposed significantly. Again, Markusen (2006) argues that it is unreasonable to try to suggest that the role and influence of artists and musicians can be compared in any way to that of scientists, engineers, and other members of the creative class.

For all these reasons and to stay true to Florida's method, the number of people working in the creative industries operating in the province was used to measure the creative class in this study. The number of people working in the creative industries actually draws a more meaningful framework for the bohemian class professionally.

Each component of the creativity index and its calculation, is explained in sub-titles along with the source of data.

Technology Component

Technology component was calculated according to three main variables of provinces. The first of variables is the High Technology Variable, which is obtained by dividing the number of people working in companies operating in the province that produce high-tech products to the total number of insured employees working in the province. According to the Nace Rev 2 codes determined by the OECD for high technology sectors (Organisation for Economic Co-operation and Development, 2018) these sectors are determined according to the High-Tech Sectors Catalogue (Table 1). According to the sectors in the catalog, data for 81 provinces were obtained from the Union of Chambers and Commodity Exchanges of Turkey (TOBB) Industry Database.

Table 1: High Tecnology Sectors

21.10. Manufacture of basic pharmaceutical products
21.20. Manufacture of pharmaceutical drugs
26.11. Manufacture of electronic components
26.12. Manufacture of loaded electronic boards
26.20. Manufacture of computers and computer peripherals
26.30. Manufacture of communication equipment
26.40. Manufacture of consumer electronics products
26.51. Manufacture of instruments and devices for measuring, testing and navigation
26.52. Manufacture of wrist watches, table and wall clocks and the like
26.60. Manufacture of devices related to irradiation, electromedical and electrotherapy
26.70. Manufacture of optical instruments and photographic equipment
26.80. Magnetic and optical cassette, tape, CD, etc. manufacture of media
30.30. Manufacture of aircraft and spacecraft and related machinery
Source: OECD,2020

The second variable of the technology index is innovation. The innovation variable was determined by dividing the total number of patents received in a province to the total number of individuals living in the province, hence, obtaining the number of patents per capita for that province. The data for the second variable is obtained from the Turkish Patent and Trademark Office (2019).

The last variable of the technology component, R&D, is calculated according to the per capita R&D expenditure calculated by proportioning the R&D expenditures made in the province to the provincial population. The data for the third variable is obtained from the Turkish Statistical Institute (2021).

Each sub-component value was ranked from largest to smallest and received score between 1 and 81 according to the number of provinces in Turkey. (The province with the highest score is 81, the province with the lowest score is 1 point). Thus, a score between 1 and 81 for each province was obtained from each of the three sub-components. By summing the scores for each province and dividing them by three, the total number of sub-components, the first sub-component of the creativity index,

Technology, emerges. Finally, the scores that calculated in the technology component were ranked from largest to smallest, and scores between 1 and 81 were distributed.

Talent Component

The talent component was calculated according to two sub-components: the human capital variable and the creative class variable. The human capital variable is obtained by dividing the population aged 25-64 with a bachelor's degree or higher to the total population of the province. Data is provided from TUIK (2021).

The creative class component, on the other hand, was obtained by dividing the number of people working in the creative industries within the province by the total number of employees in the province. British Culture, Media and Sports Directorate (Department for Culture Media and Sport, 2015) classification, which is commonly utilized for the determination of creative industries is also used in this study (Table 2).

Table 2: Creative Class Industries

32.12 Production of Jewelry and Similar Items	62.02 Computer Consulting Activities
58.11 Book Publishing	71.11 Architectural Activities
58.12 Publishing Directory and Mailing Address Lists	73.11 Advertising Agencies
58.13 Publication of Newspapers	73.12 Media Representation
58.14 Publishing Journals and Periodicals	74.10 Specialized Design Activities
58.19 Other Publishing Activities	74.20 Photography Activities
58.21 Publication of Computer Games	74.30 Translation and Translation Activities
58.29 Release of Other Software programs	90.01 Visual Arts
59.10 Motion Picture, Video and Television Program Activities	90.02 Visual Arts Support Activities
59.20 Sound Recording and Music Publishing Activities	90.03 Artistic Creativity
60.10 Radio Broadcasting	90.04 Operation of Artistic Facilities
60.20 Television Programming and Broadcasting Activities	91.01 Library and Archive Activities
62.01 Computer Programming Activities	91.02 Museum Activities
Source: DCMS, 2015	

The Location Quotient (LQ) was used in the calculation of the creative class. The Location Coefficient, which is also used in mapping the creative sectors in many studies (Esen & Atay, 2020), is obtained by dividing the number of people working in the creative sectors within the geographical area of interest by the total employment in that geographical location. Here, number of people working in creative sectors in province of j is denoted as Lij, while Lj is the total number of employees in province of j, the total number of employees in the creative industries nationwide is Li and finally the total number of employees in the entire country is L.

$$\mathbf{LQ} = \frac{L_{ij}}{L_j} / \frac{L_i}{L}$$

Each of the human capital and creative class variables were ranked from the lowest to highest according to the results, and each province had been scored between 1 and 81. The human capital and creative class scores of each province were summed up and the Talent Component was formed by dividing them into the total number of sub-components which is 2, and finally ranking them from the largest to the smallest for each city. The data of the human capital sub-component used in the talent component is available from TUIK (2021), the data of the creative class sub-component was obtained from the Social Insurance Institution (Sosyal Güvenlik Kurumu, 2021).

Tolerance Component

Tolerance component consists of self-expression, mosaic, and immigrant sub-components. Self-expression is measured by the ratio of gay and lesbian individuals to the population in the geographical unit of interest. Mosaic is obtained by the ratio of the

foreign population to the total population in the geographical unit of interest. Immigrant is obtained by dividing the migration received by the study area to the population of the province.

In this study, only the immigrant sub-component was used to measure the tolerance. The absence of an official statistical record regarding the other two variables caused this situation and revealed the limitations of the study. The immigrant index is obtained by dividing the amount of immigration received by the province to the population of the whole province. Data was obtained from TUIK (2021). According to the tolerance index, all provinces were ranked from highest to lowest, and province with the highest score obtained 81, and the city with the lowest value obtained 1, for the measurement of the tolerance component.

Calculating the Creativity Index

The scores between 1 and 81 obtained by the province according to each of the components (Technology-Talent-Tolerance) that was summed into the creativity index are added independently for each province and divided by the number of components, 3, and additionally divided by 81, and hence, creativity index was calculated for each province according to the formula below.

$$YE = (T_1 + T_2 + T_3)/(3)/81$$

In the formula, T1, T2, T3 indicate the scores obtained from the Technology-Talent-Tolerance component for each province, 3 is the total number of components, and 81 is the total number of provinces.

FINDINGS

FINDINGS OF TECHNOLOGY COMPONENT

The first of the three sub-components of the technology is the High-Tech. The presence of high technology sectors, results in production of much higher added value than traditional industrial sectors at local and regional scale. In the era of globalization and digitalization, these sectors lead to emergence of greater differences in the socio-economic structure. The first three provinces with the highest scores in the High Technology are Manisa (0,1454), Ankara (0,0758) and Eskişehir (0,0465) (Figure 2).

Figure 2: Provinces of Turkey by High Technology Index Variables

Manisa, Eskişehir and Ankara that stand out as high-value provinces, have managed to become regional centers of attraction, attracting qualified workforce, as a result of significant investments have been made in high-tech areas of the creative sectors in recent years. The number of employees in high technology sector of Manisa constitutes approximately 15% of the total employees in the province. Particularly, electronic and software sectors of the province is attracting other main and side sectors with a clustering effect. When we consider the fact that this sector make up to %50 of total exports of the province, this sector can be labelled as exporting, which makes situation even more valuable and crucial.

Ankara, on the other hand, has a state-supported defense industry-based high-tech infrastructure. Ankara is above the average of Turkey in medium-high and high-tech areas according to indicators such as the number of local units, employment rate, salaries, wages, and financial turnover (Ankara Kalkınma Ajansı, 2017). The fact that Eskişehir meets all of Turkey's aircraft engine and locomotive needs results in its crucial role in high-tech employment. The share of export of advanced technology products in total export is 3,5% in Turkey. The share of Eskişehir's exports of high technology products in total exports is 15%. In this context, Eskişehir ranks first in Turkey (Bursa Eskişehir Bilecik Kalkınma Ajansı, 2018).

23 provinces scored 0 because of the inexistence of high-tech sector or production. It is seen that twenty-three provinces that are not included in the ranking show aggregation in the Eastern Anatolia, Southeastern Anatolia and Eastern Black Sea regions.

Another sub-component in the technology component is innovation. The number of patent applications is an important indicator that points to the concrete information flows of the creative class. According to innovation scores (number of patents per capita in the province), Istanbul (0,000220), Manisa (0,000209) and Ankara (0,000187) are in the first three places. The total number of patents received in these three provinces constitute 57% of the total number of patents in Turkey. Ardahan, which does not have a patent and has score of 0, is the last in the ranking. Ardahan is followed by Siirt (0,000003) and Ağrı (0,000004). Generally, higher values are seen in east compared to west (Figure 3). While high scores are observed in the whole the Marmara Region, excluding Kırklareli, low scores are observed in the entire Southeast Region, except for Gaziantep. Indeed, provinces with a large creative class perform better economically, and innovation and entrepreneurship activities take place at a higher rate than other regions (Doğrul & Çelikkol, 2017).

Figure 3: Provinces of Turkey by Innovation Index Variables

The last sub-component in the technology component is R&D expenditures. Especially for our country, there is a consensus that the most important structural transformation tool for overcoming the bottlenecks in economic growth is to ensure the transition to higher value-added products/services, and one of the most important tools is to improve the R&D and innovation ecosystem simultaneously, the increase in R&D studies and their feasible counterparts can play an important role in reducing regional development disparities. The share of R&D expenditures in national income is important in terms of being able to compete in different geographies of the world and ensuring the continuity of innovation capacity (Güneş & Akın, 2019).

R&D expenditure per capita is 552 TL in Turkey (2019). The highest amounts in R&D expenditure per capita are seen in Ankara (2576 TL), Kocaeli (1252 TL) and Yalova (1129 TL). The lowest amounts are observed in Şırnak (17), Siirt (28) and Batman (28) (Figure 4). While the lowest per capita R&D expenditures are observed in the Southeastern Anatolia and Eastern Anatolia Regions, the highest values are reached in the Marmara Region, especially in Istanbul and its surroundings. Only Ankara and Istanbul account for 58% of the total R&D expenditure of Turkey. Although the population, administrative and socio-economic conditions of these two provinces seem normal for this result, it is expected that the distribution will spread throughout Turkey and will be shaped around averages at least. Another fact for explaining this situation is that approximately one third of R&D expenditures were made within universities in 2019.

Figure 4: Provinces of Turkey by R&D Variables

The cities with highest scores of technology component summarized according to mentioned above sub-components High-Tech, innovation and R&D are Ankara (0,98765), Manisa (0,95884) and Istanbul (0,95061). The provinces with the lowest scores are Mardin (0,03703), Siirt (0,03703) and Ardahan (0,04938). According to a converged line from Konya, Ankara, Eskişehir line in Central Anatolia Region to Düzce from Marmara Region and its north-west, Kocaeli, Istanbul, and Tekirdağ and Manisa-Izmir areas from Aegean Region has the biggest score of Technology component which are above the Turkey average, 0,49346, (Figure 5).

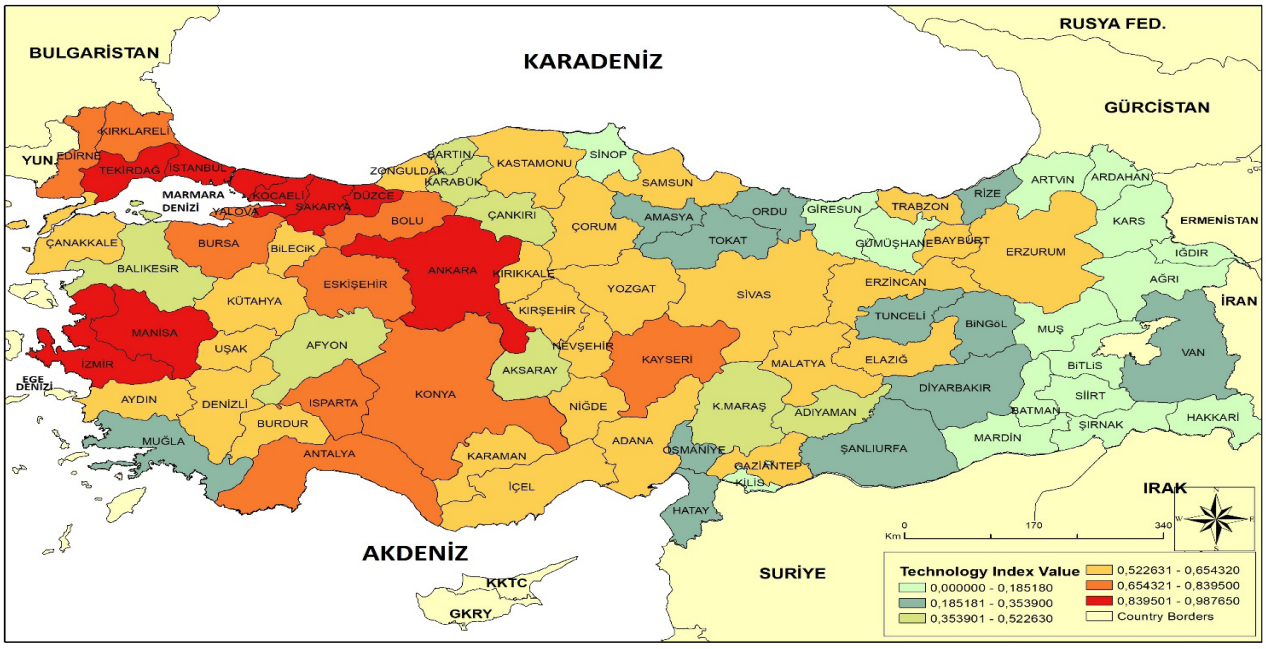

Figure 5: Provinces of Turkey by Technology Component Values

While Gaziantep (0,58436) in the South East Anatolia Region, Erzurum (0,65432) and Elazig (0,64609) in the East Anatolia Region have scores above the Turkey average, all other provinces of the two regions mentioned here have scores lower than average. It should not be overlooked that this situation is directly proportional to the level of development. Gaziantep has an industry and export base and four universities in the Southeastern Anatolia Region and, Erzurum and Elazığ have a well-rooted histories of universities compared to the surrounding provinces in Eastern Anatolia and those universities seek cooperation with industry, are modeled for their regions, hence regional technology development investments can be implemented. The three sub-components of the technology are directly interrelated to each other. Thus, the increase in R&D expenditures supports high innovation and attracts high technology production and human capital to implement it in such a socio-economic space. The increase in high-tech R&D investments in Turkey will contribute both to the emergence of new goods and services, to the increase of innovation, and by developing new technologies, to more utilization of higher technologies (Esen & Atay, 2020).

Findings of Talent Component

Geographers attribute great importance to the geography of labor and argue that key factors in a firm's decision of location are labor costs and labor quality (Florida, 2002). The first sub-component of the talent is the creative class. The distinctive feature of the creative class is that its members are engaged in work whose function is to "create new meaningful forms" (Florida, 2003). Today, goods, services and capital flows that are getting easier, focus on different phenomena such as human capital rather than local and geographical resources as new development tools across the country or its sub-scales (region-city). Nowadays, it is thought for the development of a province, traditional views such as owning natural resources and being on transportation routes are being replaced by models that show that people are the driving force for regional growth, which is called "human capital theory" (Hocaoğlu, 2015).

The three provinces with the highest creative class scores are Ankara (1,75127), Istanbul (1,71313) and Gümüşhane (1,13920). The provinces with the lowest scores are Bilecik (0,19599), Şırnak (0,21697) and Çankırı (0,26154) (Figure 6). A homogeneous

distribution is observed in the regional distribution of the creative class. In the creative sectors, 63% of the total number of employees in Turkey are located in Ankara and Istanbul. However, when we look at the creative class scores, there is no linear relationship between the size of the province and the number of employees in the creative sectors, in parallel with the study conducted by Seçilmiş (2015). Actually, the first five cprovince with the highest scores are Ankara, Istanbul, Gümüşhane, Ağrı and Elazığ.

Figure 6: Provinces of Turkey by Creative Industries Index Values

The other subcomponent of the talent is Human Capital. Human capital is an important parameter that focuses on people and affects the level of development. The advantages provided by education bring the human capital factor to the forth (Yetişen et al., 2016). This situation also plays a crucial role in the development of the region/city and its competitive advantage (Akman & Arıcıoğlu, 2019). The provinces with the highest scores in the human capital subcomponent are Ankara (0,18424), Tunceli (0,15322) and Eskişehir (0,15282). The provinces with the lowest human capital values are Şanlıurfa (0,05155), Ağrı (0,05841) and Muş (0,05194) (Figure 7). The differences between the east and west of Turkey when it comes to the human capital scores draw attention. Reducing the difference between province and increasing the human capital have a direct impact on the creative city index as well as on other components. A lack of human capital reduces a region's ability to catch the gains of economic growth or can disturb ability of workers to advance professionally (Putnam, 1993).

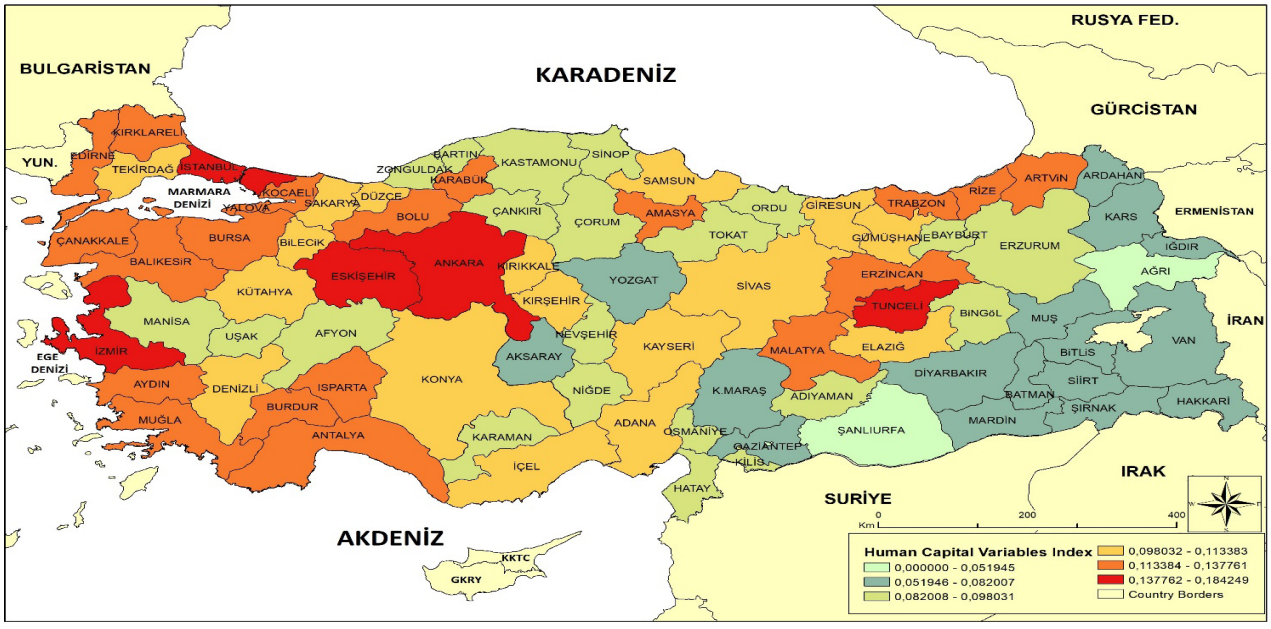

Figure 7: Provinces of Turkey by Human Capital Variables

The talent component that emerges according to the creative class and human capital subcomponents is closely related to the political stance that supports corporate innovation and individual entrepreneurship to increase welfare (Demir, 2014). The provinces with the highest talent component scores are Ankara (1,000), Istanbul (0,9691) and Izmir (0,9506). The provinces with the lowest talent component scores are Şırnak (0,037), Bitlis (0,074) and Siirt (0,074) (Figure 8). Even though Turkey's creative industry organization is currently not sufficient, a knowledge, software, hardware, technology, and consultancy based growing model such as Ankara's might be helpful to design for the future (Lazzeretti et al., 2014).

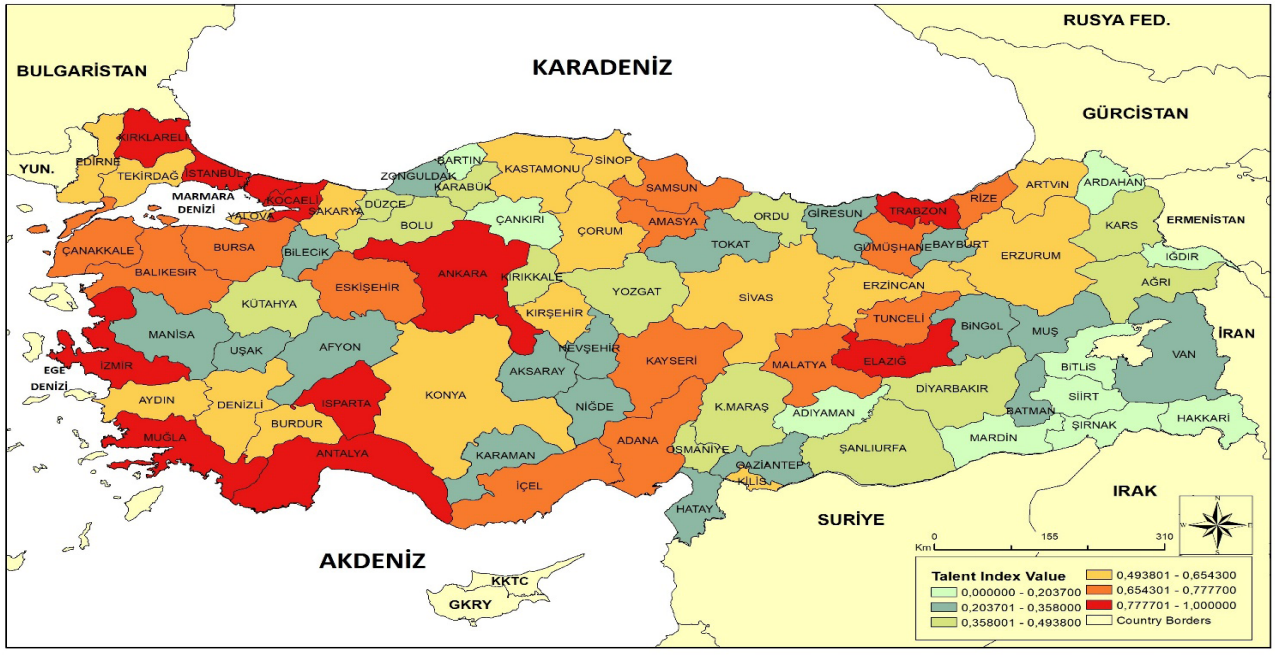

Figure 8: Provinces of Turkey by Talent Component Values

Provinces with a high talent component score also carry some other cities on their peripheries as their hinterland forward. Eskişehir is supported by Ankara, Isparta and Muğla by Antalya, Kocaeli and Kırklareli by Istanbul with the help of their geographic proximity as an advantage. In this context, İzmir has the potential to support the Aegean Region from the Manisa axis, while Elazig has the potential to support Diyarbakır and the Eastern Anatolia and Southeastern Anatolia Regions from the Malatya axis. Implementation of this should be considered as a homogeneous regional development dynamic and should be supported by policy makers.

Findings of Tolerance Component

Migrating to a new location can be repulsive, attractive, compulsory, etc. and can be due to many different reasons. When considered in the context of creative cities, the acceptance of immigrants in a city also expresses the potential of that region to be an open society, to make room for differences and as a result to create a multicultural, multi-minded and development-supporting environment that will support creative functions. In decision of migrating, behavior and acculturation of the immigrants in their new location, along with the characteristics of their arrival location and the society in which they enter have important effects on the spatial and social belonging and identity of immigrants (Turut & Özgür, 2018). In this context, creative societies are not only related to socio-economic development. It is also about having system of values that can be described as open-minded and tolerant (Andersson & Andersson, 2015).

The provinces with the highest tolerance component are Bayburt (0,10762), Gümüşhane (0,09821) and Tunceli (0,07697), according to their population. These three cities received approximately ten percent of their population with migrations. In this component, lower numbers in populations also lead in high scores. The provinces with the lowest tolerance component scores are Şanlıurfa (0,02017), Hatay (0,02163) and Adana (0,02336) (Figure 9). The map shows a different picture, as the values in question here are proportional to the population and are based only on the migration received.

Figure 9: Provinces of Turkey by Tolerance Component Values

Creativity Index

The creativity index was formed of three components: technology talent and tolerance. According to the creativity index, the most creative province of Turkey is Kocaeli (0,85596). Kocaeli is followed by Ankara with a score of 0,83950 and Isparta with a score of 0,81893 (For all provinces, see Appendix 1). The creativity index had upper and lower limits between 0,85596 and 0,06995. The provinces with the lowest creativity scores are Hakkâri (0,06995), Şırnak (0,11111) and Mardin (0,11522) (Figure 10).

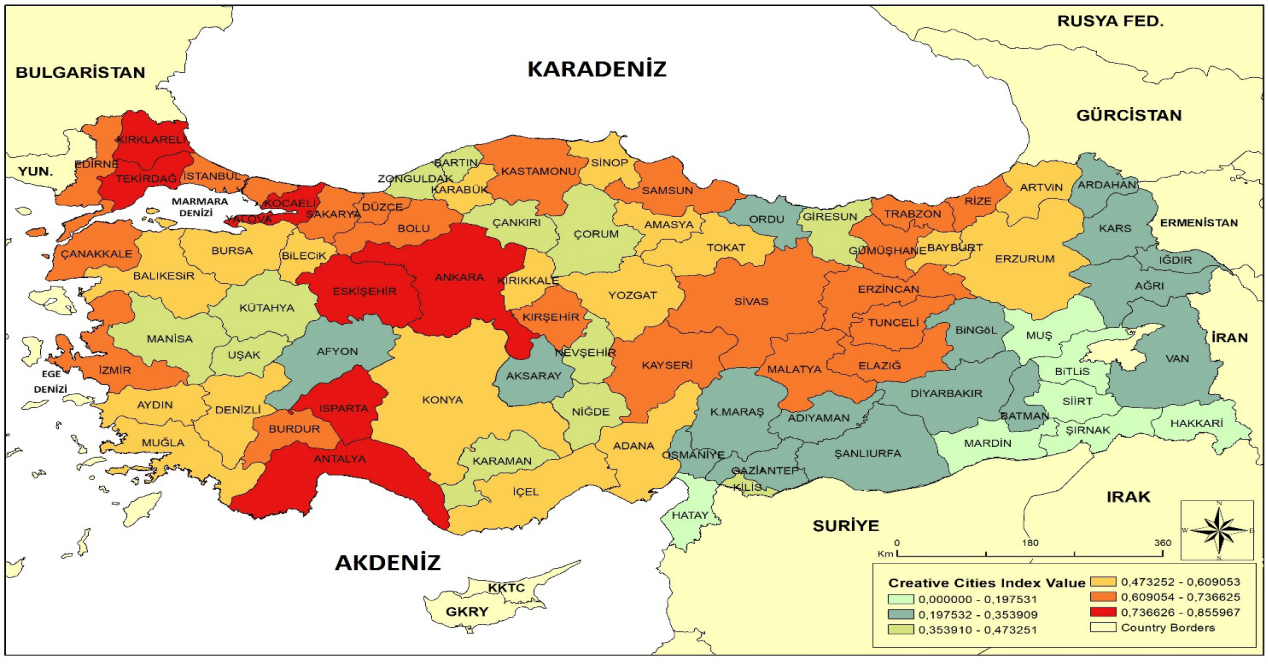

Figure 10: Distribution of Turkey's Provinces by Creativity Index

It is seen that the surrounding provinces of the capital Ankara, Istanbul and Antalya, which have a high creativity index, also reach high scores in the index. Thus, three focal points appear in the west. Istanbul-Kocaeli, Antalya-Isparta and Ankara-Eskişehir axis emerged as creative province centers. It is possible to divide the cities into five main groups according to the creativity index (Table 3).

Table 2: Creative Class Industries

VERY HIGH	HIGH	MEDIAN	LOW
Kocaeli	Elazığ	Erzurum	Çorum
Ankara	Malatya	Bilecik	Uşak
Isparta	Tunceli	Yozgat	Zonguldak
Antalya	Burdur	Kırıkkale	Bingöl
Eskişehir	Trabzon	Amasya	Osmaniye
Kırklareli	Rize	Artvin	Kars
Tekirdağ	Sakarya	Aydın	Aksaray
Yalova	Gümüşhane	Konya	Ardahan
İstanbul	Kayseri	Tokat	Ordu
Bolu	Samsun	Mersin	Iğdır
Çanakkale	Kırşehir	Adana	Afyonkarahisar
Edirne	Sivas	Balıkesir	Gaziantep

Erzincan	Düzce	Denizli	Kahramanmaraş
Kastamonu	Sinop	Manisa	Ağrı
İzmir	Bayburt	Karaman	Diyarbakır
	Karabük	Çankırı	Batman
	Muğla	Giresun	Şanlıurfa
	Bursa	Kilis	Van
		Kütahya	Adıyaman
		Nevşehir	Bitlis
		Bartın	Muş
		Niğde	Hatay
			Siirt
			Mardin
			Şırnak
			Hakkâri

***Source**: Created by the author.*

Highly creative province appear to be concentrated in the northwest of Turkey. The lowest creative provinces are clustered in the Southeast Anatolia Region. The average creativity value of province in Turkey is 0,50617. 46 of Turkey's provinces are above this average. All of the Southeastern Anatolia Region, all except the western part of the Eastern Anatolian Region, the eastern part of the Mediterranean, and the Central Western Anatolia show values below the average of Turkey in general. The whole of the Marmara Region, the Coastal Aegean, Mersin Section, and almost the entire Black Sea Region show values above the Turkey average.

CONCLUSION

The creativity functions of provinces have an important place in today's urban functions. Provinces that attract creative populations also provide significant advantages for the development and transformation of other functions. In this context, considering the creativity function of province as a sub-title of traditional urban functions will not be an adequate and healthy evaluation. In this sense, it is important to determine the creative capacity of provinces and the advantages and disadvantages of attracting the creative class. It should be expected that these determinations will have a counterpart in the field with the right actors and practitioners.

While it is not surprising to see the traditional east-west division of development in the spatial distribution of creative provinces in Turkey, it is possible to see exceptional provinces as well. The transfer of the development in the Isparta-Antalya axis to the provinces of Central West Anatolia, the fact that the Eskişehir, Bolu, Ankara triangle brings a synergy in the direction of the Western Black Sea and Central Anatolia, the spread of the Kocaeli, Istanbul, Tekirdağ, Kırklareli cluster to Edirne and South Marmara contributes to the development of the country and can offer great in the mid and long term. It is seen that the level of creative urbanization is not at sufficient for the provinces of Turkey, except for Ankara, Kocaeli and Istanbul, which relatively comply with the different definitions of the creative province in the literature.

In order to overcome the emerging regional differences, public and private sector investments should be in the axis of creating a structure focused on high and medium technology manufacturing industry. For the investment and creation of new employment in province strategies that strengthen their already existing fuctions would be ideal to not to disturb the dominant functions. Such strategies can be exemplified as investing to tourism in Muğla, and to technological growth primarily focused on agriculture for Muş and Bingöl. Thanks to Turkey's human capital because of its young population and its cultural diversity emerging naturally from its history as creative provinces there exists crucial inputs. In order to increase the qualifications of the creative class, which is the most important element of emergence of a creative class, it is important to make the educational infrastructure homogeneous and qualified in a formal and widespread manner.

Taking into account the risk of unsuccesful initiatives of forming a creative province might hinder province own potential, creative class and province concepts should be evaluated with a broader perspective in countries who are still developing such as Turkey.

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Appendix 1: The Values of the Creativity Index of the Provinces of Turkey

PROVİNCES	CREATIVITY INDEX VALUES	PROVİNCES	CREATIVITY INDEX VALUES
KOCAELİ	0,855967078	KONYA	0,53909465
ANKARA	0,839506173	TOKAT	0,53909465
ISPARTA	0,818930041	MERSİN	0,522633745
ANTALYA	0,798353909	ADANA	0,518518519
ESKİŞEHİR	0,790123457	BALIKESİR	0,50617284
KIRKLARELİ	0,790123457	DENİZLİ	0,50617284
TEKİRDAĞ	0,781893004	MANİSA	0,473251029
YALOVA	0,765432099	KARAMAN	0,465020576
İSTANBUL	0,736625514	ÇANKIRI	0,456790123
BOLU	0,732510288	GİRESUN	0,456790123
ÇANAKKALE	0,720164609	KİLİS	0,456790123
EDİRNE	0,711934156	KÜTAHYA	0,456790123
ERZİNCAN	0,703703704	NEVŞEHİR	0,448559671
KASTAMONU	0,699588477	BARTIN	0,432098765
İZMİR	0,695473251	NİĞDE	0,423868313
ELAZIĞ	0,687242798	ÇORUM	0,411522634
MALATYA	0,674897119	UŞAK	0,390946502
TUNCELİ	0,670781893	ZONGULDAK	0,378600823
BURDUR	0,666666667	BİNGÖL	0,353909465
TRABZON	0,66255144	OSMANİYE	0,353909465
RİZE	0,658436214	KARS	0,345679012
SAKARYA	0,658436214	AKSARAY	0,33744856
GÜMÜŞHANE	0,654320988	ARDAHAN	0,333333333
KAYSERİ	0,641975309	ORDU	0,333333333
SAMSUN	0,641975309	IĞDIR	0,320987654
KIRŞEHİR	0,637860082	AFYONKARAHİSAR	0,316872428
SİVAS	0,633744856	GAZİANTEP	0,29218107
DÜZCE	0,62962963	KAHRAMANMARAŞ	0,283950617
SİNOP	0,609053498	AĞRI	0,267489712
BAYBURT	0,604938272	DİYARBAKIR	0,267489712
KARABÜK	0,604938272	BATMAN	0,242798354
MUĞLA	0,604938272	ŞANLIURFA	0,242798354
BURSA	0,592592593	VAN	0,230452675
ERZURUM	0,588477366	ADIYAMAN	0,21399177
BİLECİK	0,58436214	BİTLİS	0,197530864
YOZGAT	0,580246914	MUŞ	0,172839506
KIRIKKALE	0,563786008	HATAY	0,16872428
AMASYA	0,547325103	SİİRT	0,119341564
ARTVİN	0,547325103	MARDİN	0,115226337
AYDIN	0,53909465	ŞIRNAK	0,111111111
		HAKKÂRİ	0,069958848
Source: *Created by the author.*			