DETERMINATION OF POTENTIAL SECOND-TIER CITIES IN TURKEY AND PERFORMANCE ANALYSIS[1]

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Abstract

In this study, determination of Turkey's potential second-tier cities among 81 cities depending on the performance changes in 'demographic and economic growth' and 'social, physical and institutional development' is aimed. In the realization of the aim an inductive method is adopted which depends on the respectively forming research problem, research questions and hypotheses and testing hypothesis with two-step cluster analysis. In cluster analysis, the number of cluster is defined as '8'. Potential second-tier cities in Turkey have been identified through the change of their performance in 2010, 2014 and 2017 (approximately change in every four years). In addition, in the cluster analysis both for the determination of second-tier cities and for the examination of their performance changes, year of 2010 when Turkey's economy was in welfare and balance has been chosen base year.

In the study, first of all, the importance of the second tier cities which constitute the motivation of the study will be explained. After this, in the scope of the requirements of the second-tier city concept, the limited number of studies which are for second-tier cities of Turkey[4] will be examined. In the continuation of the study, an introduction will be made to the analysis section in which the research questions has answered and hypothesis has tested. The study will conclude with a conclusion section that focuses on the original aspects of the research and what needs to be done in future studies.

[1] This study is the full text version (for he 59th ERSA Congress- Lyon) of the master thesis which has been prepared in consultation with Proffesor Doctor Ferhan Gezici Korten within the scope of Regional Planning Master Program in Istanbul Technical University, Urban and Regional Planning Department and was defended on November 19, 2018.

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[4] These cities are not named as second tier cities in these studies.

INTRODUCTION

Roberts (2014) who stated that the ‘concept of second-tier city’ was popularized by Rondinelli (1982) in the 1980s, describes the second-tier cities as cities with populations ranging from several hundred thousand to several million and expressing the second level of urban hierarchy. Apart from this and similar definitions made over population size for the second-tier cities, it has been observed that different approaches have come to the fore in the definition of second-tier cities. A group of researchers who point out that the second-tier cities cannot be defined only through 'population size' and the 'functional approach' is important in defining these cities, they suggest that the second-tier cities should be define according to their roles in urban system, their functions and socio-economic relations between them and other cities. In addition to the functional approach, Cardoso (2016a) emphasized the importance of political approach which considers the positions of cities within the political context and historical process to the identification of second-tier cities.

One of the prominent issues in the content of second-tier cities is the factors affecting the emergence of these cities or their growth and development. As a result of the literature review, it is possible to classify these factors in three basic categories as negative externalities caused by excessive accumulation in first-tier cities, ‘borrowed size (Alonso, 1973)’ related to proximity to metropolitan area and lastly ‘local, national or global network connectivity’. It is said that the second-tier cities avoid the disadvantages arising from the proximity to the big metropolises, they are able to borrow role (advantages from proximity) from the metropolises in which they are located in their influenced areas and lastly they are able to reach networks in these cities (Yiğitcanlar et al., 2015) about the second important comment in the emergence of the second-tier cities which is the 'borrowed size'. The final comment about the development of the second-tier cities is related to the networks they are associated with at the local, national or global level. As stated by Capello (2000) 'network connections' (McCann and Acs, 2011) that match well with the 'urban network externalities' resulting from functional relations between cities can replace the agglomeration benefits (Derudder, as referred to in 2017).

Another issue in the literature for the second-tier cities is the performance of these cities in terms of ‘national demographic and economic growth’ and ‘development of social and institutional structure’ compared to the first-tier cities. Parkinson et al. (2015) stated that although the second-tier cities could act less on the global scale, they are a source of dynamism for the regions outside the capital and made significant contributions to national growth. In

general, even if the invidual contribution of the second-tier cities to the national growth is behind the first-tier cities, the contribution which is made together to the growth was beyond the first-tier cities. The performance of the second-tier cities is examined in the literature of developed countries through the decentralization process in the capitals and the impact of policentric development on balanced development in the nation-wide. In developing countries, the role of second-tier cities is evaluated in order to sustain national growth in the process of decreasing returns due to the excessive growth of first-tier cities rather than a performance review.

In the following sections of the study first of all, the importance of the second tier cities which constitute the motivation of the study will be explained. After this, in the scope of the requirements of the second-tier city concept, the limited number of studies which are for second-tier cities of Turkey[5] will be examined. In the continuation of the study, an introduction will be made to the analysis section in which the research questions has answered and hypothesis has tested. The study will conclude with a conclusion section that focuses on the original aspects of the research and what needs to be done in future studies.

1. WHY SECOND-TIER CITIES MATTERS?

In the developed countries second-tier cities are defined based on their performance compared to first-tier cities in terms of the importance of their contribution to national economic growth and demographic, social and physical development. Parkinson et al. (2015) states that although second-tier cities may be less active on the global level, they are a source of dynamism for the regions outside the capital and make significant contributions to national growth. Even if the individual contribution of second tier cities to national growth lags behind the first tier cities, when these cities come together, they have contributed to national economic, social or demographic growth beyond the first-tier cities in some countries. In federal states (such as Germany and Austria) where balanced economic growth and development is observed due to the multi-centered structure of urban systems and where decentralization of power, resources and responsibility is high, second-tier cities have contributed to national growth individually beyond capitals (ESPON, 2012). In these countries the performance shown by second-tier cities

[5] These cities are not named as second tier cities in these studies.

in national growth is higher than first-tier cities and this situation is very closely related to polycentricity and decentralization policies.

In developing countries (especially in Latin America and Caribbean countries), as stated by World Bank (2006) recently academic studies have begun to focus on second-tier cities due to the negative externalities caused by the overcrowding of economic activity, income, population or resources in major metropolises in developing countries. The agglomeration of major metropolises creates problems both for the metropolises themselves and for other cities within the country's urban system. The agglomeration economies whose benefits are not limitless create negative externalities such as irregular / unplanned growth due to rapid urbanization, deterioration in infrastructure, urban sprawl due to limited land, high cost of living and marginalized human capital (Evans, 2015). Therefore, the negative economies of scale that occur in the metropolises form the boundaries of these cities and reduce their competitive advantages (Parkinson et al., 2012; Parkinson et al., 2015; Parkinson, 2016). Excessive growth of large metropolises or concentration of economic activity, employment, income and investments in these cities causes other cities to be deprived of the mentioned growth factors and to an increase in the difference between these cities. In the country as a whole, this has an impact on increasing inter-regional inequalities due to unbalanced growth. In summary, the reason for the interest in the second tier cities in the literature of developing countries in recent years is the problems caused by the widening of the gap between the first tier cities. The idea that second-tier cities can fulfill most of the agglomeration effects in first-tier cities when supported by policies specific to their own dynamics (Camagni et al., 2015) is another reason for attracting attention.

Table 1: Indicators and indicator groups used to measure the performance of second-tier cities.

STUDY	*AUTHOR*	*INDICATOR GROUPS*	*INDICATORS*	*VARIABLE*	*YEAR*
First and Second-tier Cities in Regional Agglomeration Models	***Chiara Agnoletti Chiara Bocci Sabrina Iommi Patrizia Lattarulo Donatella Marinari***	Urban Hierarchy Urban competitiveness Sustainability of the settlement	Population size Specialization and diversification in high technology manufacturing and high level services Economic performance Existence of highly specialized health services. Specialized training opportunities Business meetings Export Capacity Land occupancy rate	Number of persons Number of employees per person Value added per living Number of patients from outside the region Number of students coming from outside the region and enrolling in local universities Number of business trips to the region Export per capita Ratio of urbanized area to total area Building density	2015
Harnessing the Economic Potential of 'Second-Tier' European Cities: Lessons From Four	***Richard Evans***		Population and change Employment and change Productivity Total GDP and change Economic performance	Number of Employess GDP Per Person Employee GDP GDP Per Capita Number of firms Number of employees	2015

Different State/ Urban Systems			Being in the top five hundred companies Advanced producer services Banks Existence of exhibition areas	Number Number	
The Strength of Second-Tier Strategies Under Globalization: A Comparative Study of Nanjing and Hamgzhou as Burgeoning Second-Tier Cities	***Tianni Wang***		Urban area Investment climate Import and export Secondary industrial trend Tertiary industrial trend Foreign visitors	size Foreign direct investments Fixed asset investment Total Import and export Import only Export only number	2015
Contrasts Between First-Tier and Second-Tier Cities In Europe: A Functional Perspective	***RodrigoV. Cardosa Evert J. Meijers***	Distribution of functions and diversity Science Culture Sport	Being in the top five hundred companies Advanced producer services Banks Existence of exhibition areas Major universities International research organizations Cultural Events Cultural sites Stadiums Olympic summer games venues Great sporting events	Number of firms employment number number number number number number number number number	2016
Does Size Matter? Knowledge- Based Development of Second-Order City Regions in Finland	***Tan Yiğitcanlar Tommi Inkinen Teemu Makkonen***	Economic Development Social Development Spatial Development Institutional Development	Macroeconomic fundamentals The basis of knowledge economy Human and social capital Diversity and independence Space and life quality Sustainable Urban Development Planning and Leadership Support and Partnership	GDP Chief administrative units of enterprises Disposable Income Unemployment (long-term) R & D expenditures Patent registrations Knowledge workers Knowledge-intensive jobs Investments in education Specialized talent University prestige Wireless broadband coverage Cultural diversity Incoming migration Socio-economic dependence Income inequality Life quality Personal security Affordable Housing Cost of living Urban form and density Use of Sustainable Transport Greenhouse gas emissions Alleviation of climate change Strategic planning Brand and marketing Political leadership and sustainability. Community organizations Government grants and incentives Innovation awareness and support State-industry-academy cooperation Connectivity to global networks	2015
Best Performing Cities China The Nations Most Succesful Economies	***Perry Wong Michael C. Y. Lin Jessica Jackson***		Job Wage Gross regional income per capita Foreign direct investment Specialization coefficient in high value added industries	Annual increase rate Annual increase rate Annual increase rate Annual increase rate Employment	2016
How Do Second-Tier Cities Perform and Compare With Capitals	***Jay Karecha Richard Meegan Michael Parkinson (ESPON)***	Population Economic Importance Performance Productivity Unemployment Key drivers of economy	Pop. size Growth in GDP GDP per capita Employment Employment per employee Unemployment Innovation Talent + Human capital Leading sectors connectivity	Proportional change over years Proportional change over years Proportional change over years Proportional change over years Proportional change over years Proportional change over years Patent application numbers Higher education level (number of graduates) Employment rates and changes in finance-based sectors Existence and number of airports by national, supranational, central and regional scale	2012

2. AN EVALUATION ON SECOND-TIER CITIES IN TURKEY

In order to explore the tendency about second-tier cities of Turkey, national literature which has limited number study and the international literature on the development process of the second-tier cities has been examined together. As a result, the second-tier cities of Turkey are discovered as cities strengthened by structural transformation between 1980-2000 (Taymaz ve diğ, 2008) and cities identified as Anatolian Tigers (Eşiyok, 2001) or New Industrial Centers (Eraydın, 2002) by some researchers. Another tendency about second-tier cities of Turkey indicates the metropolitan sub-centers developing as a result of the decentralization of industrial activities from traditional industrial centers which are Istanbul, Ankara, Izmir, Adana.

Table 2: Classification of cities according to development patterns in the studies for second-tier cities in Turkey.

Turkey's Second Tier Cities				
Author / Title	Traditional Industrial Centers	Anatolian Tigers	Not Described as Anatolian Tiger	Metropolitan Sub-centers
TEPAV and World Bank, 2015		Kayseri, Gaziantep	Mardin, Samsun, Malatya, Trabzon, Mersin	Under the influence of Istanbul: Bursa, Kocaeli, Tekirdag, Sakarya Under the influence of Adana: Mersin
European Union Project (2013)		Denizli, Gaziantep, Kayseri		
World Bank, 2015		Gaziantep		
Roberts, 2014	Ankara, Izmir, Adana	Eskişehir, Gaziantep, Kayseri, Konya	Diyarbakır	Under the influence of Istanbul: Bursa, Kocaeli, Sakarya Under the influence of Adana: Mersin

In the studies related to the national literature, only one studies have been found using the concept of second tier city. TEPAV and World Bank has addressed the metropolitan sub-centers and Anatolian Tigers as second-tier cities of Turkey in their study which is about Turkey's urbanization process and published in 2015. Another study on Turkey's second-tier cities is an European Union project which examines the development dynamics of second-tier cities in Turkey. The project name is 'Europe's Second Tier Cities: Regional Industrial Development in Turkey'. Except this, in the study of 2014, Roberts has reviewed the effective policies about second-tier cities of Turkey, their problems and development process of them. Finally in 2015, World Bank has included the Gaziantep which has choosen from Turkey to their study

examined the competitive advantages offered by second tier cities in different countries of the world (Table 2).

3. DETERMINATION OF POTENTIAL SECOND-TIER CITIES IN TURKEY AND PERFORMANCE ANALYSIS

Urban system of Turkey is dominated by a few metropolises. Most of the agglomeration factors such as economic activity, population, employment and investments are concentrated in Istanbul, Ankara and Izmir which are the dominant cities in the urban system (Figure 1, Figure 2). Overman and Venables (2005) stated that dominant cities emerges because of the concentration of population in one or more cities in the development process of developing countries and as a result dominant cities have higher income levels than the national average (such as in Asia, Africa and Latin America). However, Faraji et al. (2016) stated that due to the high concentration of investments in some developing countries such as Brazil and Colombia which have a high index of urban dominance, dominant cities like Sao Paulo and Bogota have much higher growth rate than the other cities in the urban system of country. Therefore, it is stated that dominant cities are barriers to the development of other cities rather than creating a new socioeconomic order and prosperity (Duranton, 2008). Overcrowding in the metropolitan areas and inter-regional inequalities are the common problems especially in developing countries such as Latin America and Caribbean countries along with Turkey. World Bank (2006) states that Brazil, one of the Latin American countries, has focused on the role of other cities outside the metropolises within the urban system in solving these problems.

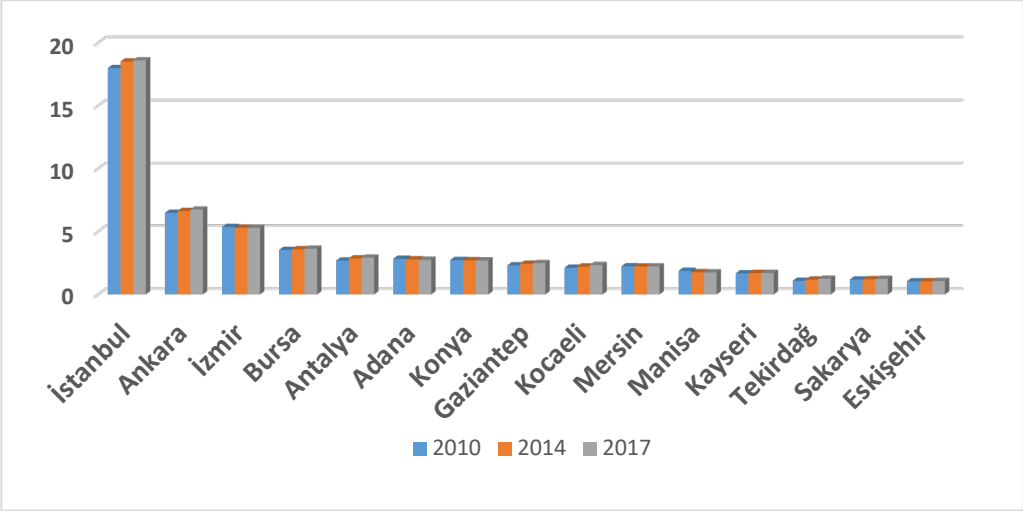


Figure 1 : Change in the share of the country's total population (%) in Istanbul, Ankara, Izmir and selected cities

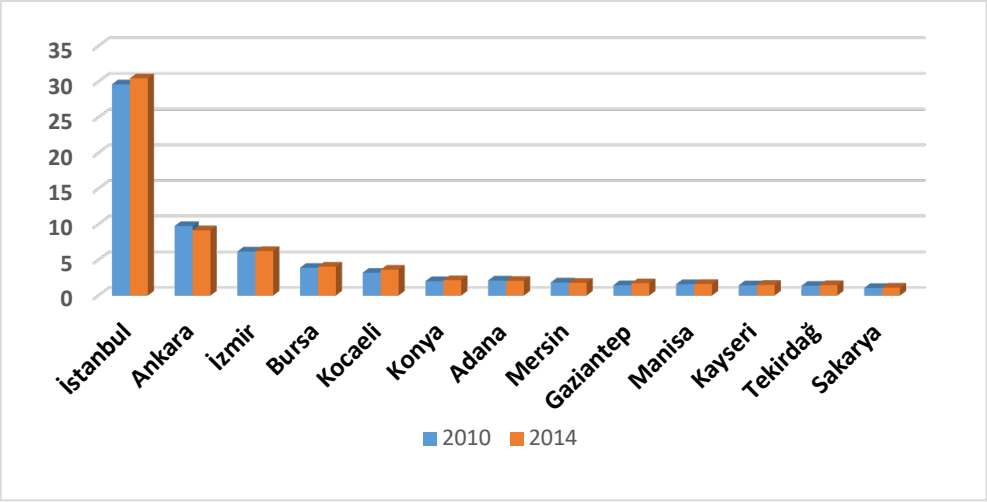


Figure 2: Change in the share of the country's total GDP in Istanbul, Ankara, Izmir and selected cities (%)

At the same time, in the literature of developed countries a wide area has been devoted to the importance of second tier cities in achieving balanced growth and development between regions and multicentric urban development throughout the country. Along with the contribution of second tier cities to national economic, demographic, social, physical and institutional growth, the importance of their performance in this sense have been expressed by various researchers in various scopes. As a result, the starting point of the research problem identified within the scope of this study is inequalities between regions due to unbalanced growth throughout the country. The research problem identified within the scope of the study focuses on the fact that the importance of second tier cities has not yet been discovered in the national literature.

3.1.Methodology

In this section in which the Turkey's potential second-tier cities determined through their performance in a certain period and their performances examined compared to other cities in the country's urban system cluster analysis is used as the analysis method. Cluster analysis is simply defined as the discovery of clusters in data sets (Everitt et al., 2011, p. 3). Cluster analysis realizes the decomposition process into clusters by calculating the values of the units on all variables participating in the measurement (Yaz, 2014). As a result of the measurement, the sampling units are assigned to the cluster closest to the cluster center.

In this study, two-stage cluster analysis (IBM Knowledge Services, 2018) which is one of the cluster methods used in the analysis of large and heterogeneous data sets was used to deal with categorical and continuous variables. In accordance with the above explanations, through

cluster analysis it is expected that eighty one cities of Turkey which constitute the sample of the analysis will be divided into clusters based on the proximity of their performance in the measurement years. The Manhattan method (Yılmaz and Patır, 2011) based on similarity and proximity criteria was used in the assignment of cities to clusters. Thus Turkey's 81 cities are divided into eight separate cluster for each year according to the proximity of performance to each other.

Potential second-tier cities of Turkey will be identified through cities' transitions between clusters (performance change) depending on the years. In the determination of the potential second tier cities of Turkey, the performance change realized during the four-year period covering the years 2010, 2014 and 2017 in which the economy was relatively prosperous and balanced after the 2008 Global Financial Crisis was taken as basis.

In the analysis, it is necessary to select a base year in order to interpret the transitions made by the cities between clusters. For cluster analysis 2010 was chosen as the base year of the analysis. The reason for this is to avoid misleading results caused by the crisis in statistical methods such as cluster analysis due to sudden ups-downs in the indicator values of the units forming the sample. Also in 2010 economy of Turkey was relatively more prosperity and stability.

Table 3: Sub-indicators used in cluster analysis performed within the scope of the study.

INDICATOR GROUP	BOTTOM INDICATOR GROUP		INDICATOR	USAGE	YEAR
DEMOGRAPHIC GROWTH	Population		Population size (%)	Share in the country's total population	2010-2017
			Population growth rate (%)	Population growth rate	2010-2017
			Population density (%)	Percentage by country population density value (In order to monitor the change)	2010-2017
			Young population ratio (%)	Share of young population in total population	2010-2017
	Migration		Net migration rate (%)	Net migration rate	2010-2017
ECONOMIC GROWTH	Macro-economic Indicators	Economic Growth	GDP (%)	Share in total GDP	2010-2014
			Industrial sector GDP (%)	Share in total industry sector GDP	2010-2014
			Service sector GDP (%)	Share in total service sector GDP	2010-2014

		GDP per capita (%)	Percentage by country GDP per capita (In order to monitor the change)	2010-2014
		Employment (%)	Number of employees per person in the city	2010-2017
	Innovation	Patent registrations (%)	Ratio of patent registrations to cities' population (per person)	2010-2017
		Total brand, utility model and design registration (%)	Ratio of total brand, utility model and design registration to cities' population (per person)	2010-2017
DEVELOPMENT OF SOCIAL STRUCTURE	education level	Number of academicians per student in higher education (%)	Number of academicians per student studying at a higher education level in the city	2010-2017
		Proportion of graduates from college and above (%)	Proportion of graduates from higher education to the city population	2010-2017
	Success of Attracting Human Capital	Educational status of received migration (%)	Proportion of students at higher education level in received migration	2010-2017
DEVELOPMENT OF PHYSICAL STRUCTURE	Connectivity / Accessibility	The total number of airline passengers (%)	The ratio of the total number of passengers in the city to the total number of passengers in the country	2010-2017
		Number of international passengers in airlines (%)	Ratio of the number of international passengers of city to the total number of international passengers of country	2010-2017
DEVELOPMENT OF INSTITUTIONAL STRUCTURE	Budget	Total collection (%)	Share in total collection	2010-2017
		Total expenditures (%)	Share in total expenditure	2010-2017
	Support and investment environment	Public investments (%)	Share in total public investments	2010-2017
		Foreign capital (%)	Share in country total	2010-2017

3.2.Results of the measurement

As a result, Turkey's potential second-tier cities has been defined as metropolitan sub-centers which are 'Bursa, Kocaeli, Sakarya, Tekirdag' growing under the influence of Istanbul and

'Manisa' growing under the influence of Izmir and 'Gaziantep and Kayseri' defined as Anatolian Tigers in the literature. It has been determined that the second-tier cities, which are different from each other for development reasons, differ from each other in terms of performance in the measurement period. In general, metropolitan sub-centers which are among the potential second-tier cities in Turkey, showed a better performance than the Anatolian Tigers in the relevant period. Additionally Turkey's potential second-tier cities also came to the fore among other cities with performance in the demographic and economic growth and they remained relatively backward in the performance shown in development of the social, physical and institutional structure.

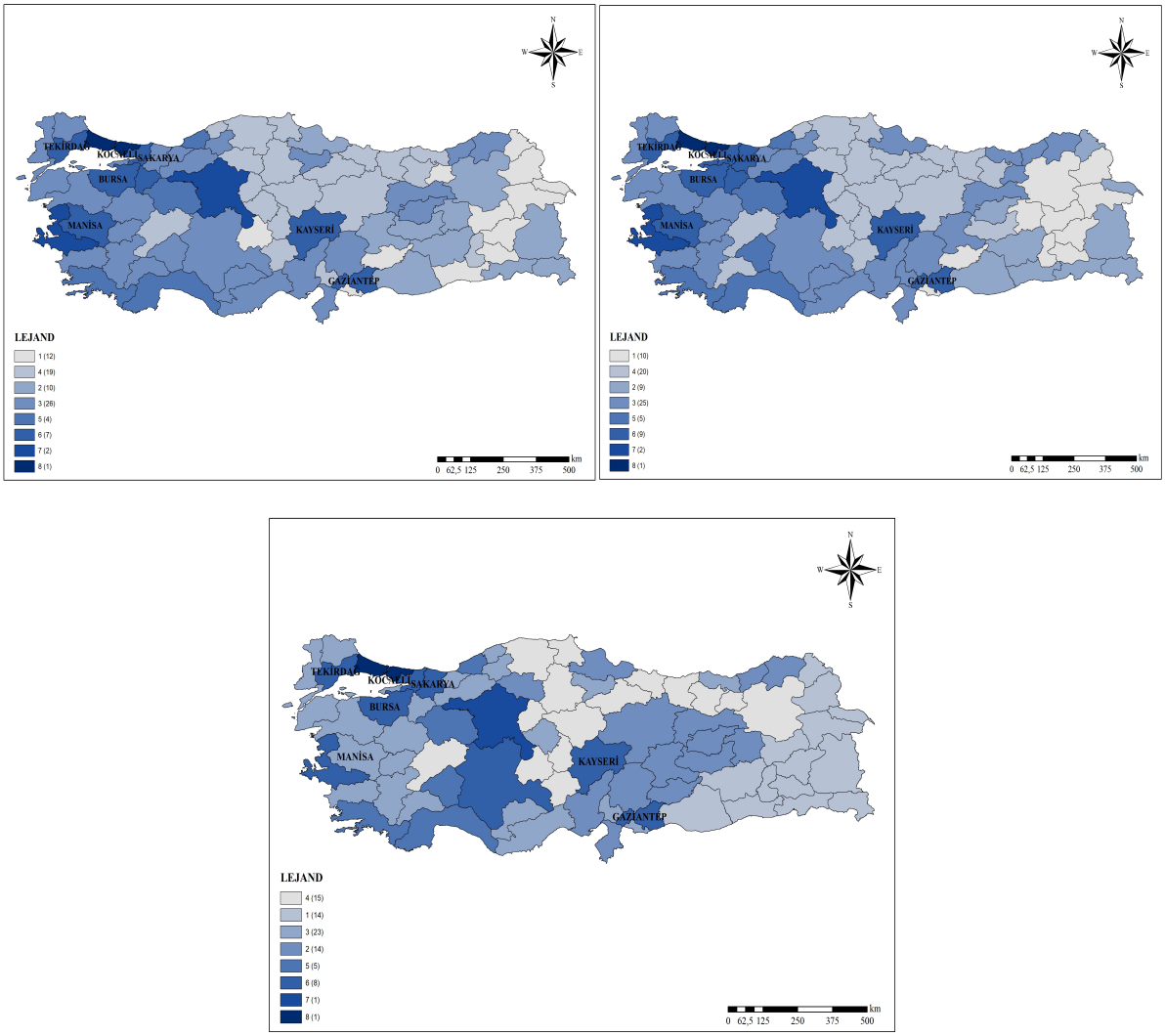
Table 4: Distribution of cities into the clusters in 2010.

Cluster 8	Cluster 7	Cluster 6	Cluster 5	Cluster 4	Cluster 3	Cluster 2	Cluster 1
İstanbul	Ankara İzmir	Bilecik Bursa Gaziantep Kayseri Kocaeli Manisa Tekirdağ	Antalya Eskişehir Muğla Zonguldak	Afyonkarahisar Bartın Batman Çankırı Çorum Giresun Gümüşhane Kastamonu Kırıkkale Kırşehir Nevşehir Niğde Ordu Osmaniye Sinop Sivas Tokat Trabzon Yozgat	Adana Amasya Artvin Aydın Balıkesir Bolu Burdur Çanakkale Denizli Düzce Edirne Erzincan Hatay Isparta Kahramanmaraş Karabük Karaman Kırklareli Konya Kütahya Mersin Rize Sakarya Tunceli Uşak Yalova	Bingöl Diyarbakır Elazığ Erzurum Hakkari Malatya Samsun Şanlıurfa Şırnak Van	Adıyaman Ağrı Aksaray Ardahan Bayburt Bitlis Iğdır Kars Kilis Mardin Muş Siirt

Istanbul which is located in the best cluster (8th cluster) in all periods and all years of the cluster analysis period, is the deviant value of the analysis as thought before starting the analysis. The dominance of 8th cluster over the successive clusters in the performance ranking was predicted before the analysis. However, in order to understand this dominance and the degree of performance differences of Istanbul with other clusters, Istanbul was included in the analysis. Moreover, there is a greater difference between the performance values of the 8th cluster and

other clusters. As a result, Turkey's first-tier cities is designated as Istanbul in cluster 8 (Table 4) and as Izmir and Ankara in the 7th cluster (Table 4) which follows the 8th cluster in terms of the performance.

Figure 3: Distribution of provinces into clusters in 2010, 2014 and 2017 (respectively)



Second-tier cities of Turkey were selected among the cities in the sixth cluster[6] which ranks 2nd in terms of performance after Istanbul, the capital city Ankara and Izmir. Cities in the sixth

[6] As seen in Table 4, Bilecik is located in the 6th cluster. However, it was eliminated from the second-tier cities of Turkey, according to a population threshold. The population of Bilecik is 221,693 in 2018. There are approximately 700,000 population differences between Sakarya, which is one of the second-tier city of Turkey. In addition, as stated by Hamm and Rosenfeld (2017) cities with a population similar to Bilecik can only be third-tier cities today.

cluster has given preliminary information about what are the second-tier cities in Turkey. In here, cluster analysis where the cities are assigned to the closest cluster according to their performance over the distance from cluster centers provides information on the level of performance shown. However, it does not provide any information about the increase or decrease tendency in performance indicators depending on years. Therefore, the fact that a city is located in the sixth cluster is not sufficient by itself to be a second-tier city. For this reason, the transitions to the sixth cluster or the transitions from the sixth cluster were examined together with the increasing and decreasing tendencies (Table 5). Various policies will be developed in order to strengthen the second-tier cities which are Bursa, Kocaeli, Tekirdag, Sakarya, Gaziantep, Kayseri and Manisa because of the their performans tendency in sub-indicators.

Table 5: The trend observed in the sub-indicator values of cities in 2010, 2014, 2017 (increasing +, decreasing -).

	PERFORMANCES INDICATORS									
City	**Pop. size**	**Pop. density.**	**Pop. Growth rate**	**Net mig. rate**	**Public invest. share**	**Share of foreign invest.**	**Employment**	**Total GDP**	**GDP Per Capita**	**Indust. GDP**
BURSA	+	+	-	+	+	+	+	+	+	+
GAZİANTEP	+	+	-	-	+	+	+	+	+	+
KOCAELİ	+	+	+	+	+	-	+	+	+	+
BİLECİK	-	-	-	+	+	+	+	-	+	+
KAYSERİ	+	+	-	-	-	+	+	+	+	+
TEKİRDAĞ	+	+	+	+	+	-	+	+	-	+
SAKARYA	+	+	+	+	+	+	+	+	+	+
MANİSA	-	-	-	+	+	-	+	+	+	+
YALOVA[7]	+	+	+	+	-	-	+	+	+	+

[7] Similar to the reasons mentioned in Bilecik, Yalova was eliminated from the second-tier cities.

4. CONCLUSION

According to the results of cluster analysis, the second-tier cities defined as metropolitan sub-centers (Bursa, Kocaeli, Tekirdağ, Sakarya and Manisa) and as Anatolian tigers (Gaziantep and Kayseri) differ from each other in terms of their performance during the measurement years. However, as a result of the researches carried out to find out the factors affecting the growth and development of the second-tier cities, it was observed that the metropolitan sub-centers and the Anatolian Tigers differ each other according to the reasons and periods of development. The metropolitan sub-centers, which have come to the forefront with their performance in economic and demographic growth against first-tier cities (İstanbul, Ankara, İzmir) in the period between 2010 and 2017 (post-crisis period) and lagged behind the first-tier cities in the performance shown in the development of social, institutional and physical structure, generally performed better in national growth than the Anatolian Tigers in this period. .Among the metropolitan sub-centers, the performance of Kocaeli, Bursa and Sakarya in national growth is better than Tekirdağ and Manisa while in the Anatolian Tigers, Gaziantep performs better than Kayseri.

This study in which the Turkey's potential second-tier cities are identified and their performances measured provides a contribution to the literature with detailed analysis based on the literature, methodology and results. As noted previously, there is a limited number of studies in second-tier cities concept itself in Turkey. However, this study differs from these studies within the scope of the method used and the literature used. The two-stage process followed which is used for determining potential second-tier cities in Turkey and evaluating their performance and also the method[8] used in this process constitute the original aspects of the thesis. Thus, the nature of study is an important contribution to both the literature in Turkey and developing countries where academic studies have focused on the importance of second tier cities in recent years. Considering the difficulties experienced in accessing the data, in the following studies it will be an important contribution to the existing literature on the concept of second-tier city by examining the growth and development processes of second-tier cities, the effects of the relationships they have established with their close settlements and their

[8] Used for constructing indicators and indicator groups, establishing relations between objectives and analysis method.

connections with the networks of different scales (local, national, global) by using spatial data analysis methods such as spatial data concept.

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ANNEXES

Annex 1: Distribution of cities into clusters in 2014.

Cluster 8	Cluster 7	Cluster 6	Cluster 5	Cluster 4	Cluster 3	Cluster 2	Cluster 1
İstanbul	Ankara	Bilecik	Antalya	Afyonkarahisar	Osmaniye	Tunceli	Batman
	İzmir	Bursa	Eskişehir	Bartın	Trabzon	Diyarbakır	Bingöl
		Gaziantep	Muğla	Çankırı	Adana	Hakkari	Erzurum
		Kayseri	Zonguldak	Çorum	Artvin	Şanlıurfa	Adıyaman
		Kocaeli	Isparta	Giresun	Aydın	Şırnak	Ağrı
		Manisa		Gümüşhane	Balıkesir	Van	Bitlis
		Tekirdağ		Kastamonu	Bolu	Ardahan	Kars
		Sakarya		Kırıkkale	Çanakkale	Iğdır	Kilis
		Yalova		Kırşehir	Denizli	Mardin	Muş
				Nevşehir	Düzce		Siirt
				Niğde	Edirne		
				Ordu	Erzincan		
				Sinop	Hatay		
				Sivas	Kahramanmaraş		
				Tokat	Karabük		
				Yozgat	Karaman		
				Amasya	Kırklareli		
				Burdur	Konya		
				Elazığ	Kütahya		
				Aksaray	Mersin		
					Rize		
					Uşak		
					Malatya		
					Samsun		
					Bayburt		

Annex 2: Distribution of cities into clusters in 2017.

Cluster 8	Cluster 7	Cluster 6	Cluster 5	Cluster 4	Cluster 3	Cluster 2	Cluster 1
İstanbul	Ankara	İzmir	Antalya	Aksaray	Manisa	Adıyaman	Ağrı
		Bursa	Eskişehir	Bayburt	Bartın	Çankırı	Ardahan
		Gaziantep	Muğla	Çorum	Kırşehir	Artvin	Batman
		Kayseri	Zonguldak	Giresun	Kilis	Erzincan	Bitlis
		Kocaeli	Isparta	Gümüşhane	Osmaniye	Rize	Iğdır
		Tekirdağ		Kastamonu	Amasya	Tunceli	Kars
		Sakarya		Kırıkkale	Balıkesir	Adana	Mardin
		Konya		Nevşehir	Bilecik	Elazığ	Siirt
				Niğde	Bolu	Hatay	Diyarbakır
				Ordu	Burdur	Kahramanmaraş	Hakkari
				Tokat	Çanakkale	Malatya	Muş
				Yozgat	Denizli	Samsun	Şanlıurfa
				Afyonkarahisar	Düzce	Sivas	Şırnak
				Erzurum	Edirne	Bingöl	Van
				Sinop	Karabük		
					Karaman		
					Kırklareli		
					Kütahya		
					Uşak		
					Yalova		
					Aydın		
					Mersin		
					Trabzon		