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ARAŞTIRMA MAKALESİ / RESEARCH ARTICLE

URBANIZATION PROCESS IN TURKEY AND EXAMINATION OF THE RELATIONSHIP BETWEEN THE GDP DATA OF PROVINCES AND THE MIGRATION RATES OF PROVINCES BY CLUSTERING ANALYSIS

TÜRKİYE'DE KENTLEŞME SÜRECİ VE İLLERİN GSYH VERİLERİ İLE GÖÇ ORANLARI ARASINDAKİ İLİŞKİNİN KÜMELEME ANALİZİYLE İNCELENMESİ

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ABSTRACT

Migration is a concept as old as human history. Large-scale migrations have occurred in every period of human history. There are many economic, social, political and legal reasons behind migration movements. It is known that economic reasons are the most determining factors in the occurrence of migration. Generally, the direction of migration is from rural to urban, underdeveloped regions to developed regions, east to west in Turkey. Population is largely concentrated in cities. Cities with a high level of economic development are the cities with the most populous population. While many socio-economic indicators can be used to reveal the level of economic development, an evaluation can also be made based on the GDP data of the provinces, which is considered as a combination of these indicators. In the study, a statistical significance relationship is sought between migration data and GDP data of the provinces. The analysis method used is the cluster analysis. According to the results, the basic hypothesis of the study is confirmed at a rate of 79%. That means, the provinces with high GDP levels receive immigration, while the provinces with low GDP emigrate.

Keywords: Migration, Urbanization, Clustering Analysis.

JEL Classification Codes: H83, K12, K 23, K31.

ÖZ

Göç, insanlık tarihi kadar eski bir kavramdır. İnsanlık tarihinin her döneminde büyük ölçekli göçler meydana gelmiştir. Göç hareketlerinin temelinde çok sayıda ekonomik, sosyal, kültürel, siyasi ve hukuki neden yer almaktadır. Göçün ortaya çıkmasında en belirleyici etkenin ekonomik nedenler olduğu bilinmektedir. Türkiye'de göçün yönü genellikle kırdan kente, az gelişmiş yörelerden gelişmiş yörelere, doğudan batıya doğru olmuştur. Nüfus, büyük ölçüde kentlerde toplanmıştır. Ekonomik gelişmişlik düzeyi yüksek olan kentler, nüfusu en kalabalık olan kentlerdir. Ekonomik gelişmişlik düzeyini ortaya koymak üzere çok sayıda sosyo- ekonomik göstergeden yararlanılabileceği gibi, bu göstergelerin bir bileşkesi olarak kabul ettiğimiz illerin Gayrisafi Yurtiçi Hâsıla (GSYH) verilerini temel alarak bir değerlendirme de yapılabilir. Bu çalışmada, illerin göç verileri ile illerin GSYH verileri arasında istatistiksel bir anlamlılık ilişkisi aranmaktadır. Kullanılan analiz yöntemi kümeleme analizidir. Sonuçlara göre çalışmamızın temel hipotezi %79 oranında doğrulanmaktadır. Yani GSYİH düzeyi yüksek olan iller göç alırken, GSYİH düzeyi düşük olan iller göç vermektedir.

Anahtar Kelimeler: Göç, Kentleşme, Kümeleme Analizi.

JEL Sınıflandırma Kodları: H83, K12, K 23, K31.

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GENİŞLETİLMİŞ ÖZET

Amaç ve Kapsam:

Göç hareketlerinin temelinde çok sayıda ekonomik, sosyal, kültürel, siyasi ve hukuki neden yer almaktadır. Hangi etmenin ne ölçüde etkide bulunduğunu tespit etmek her zaman mümkün olmasa da en belirleyici etmenin ekonomik nedenler olduğu konusunda geniş bir konsensüs bulunmaktadır. Türkiye'de göçün yönü genellikle kırdan kente, az gelişmiş yörelerden gelişmiş yörelere, doğudan batıya doğru olmuştur. Nüfus, büyük ölçüde kentlerde toplanmıştır. Ekonomik gelişmişlik düzeyi yüksek olan kentler, nüfusu en kalabalık olan kentlerdir. Türkiye'de iç göç hareketlerinin tarihçesi, gelişim evresi ve temel dinamikleri üzerine literatürde geniş kapsamlı değerlendirmeler, alan araştırmaları bulunmaktadır. Özellikle ekonomik etkenlerin göç hareketlerinin temel dinamiği olduğunu gösteren çok sayıda araştırma yapılmıştır. Bu araştırmalarda, ekonomik etkenlerin göç olgusu üzerindeki etkisi ölçebilmek adına bazı sosyo-ekonomik göstergelerle göç oranları arasındaki ilişkiyi irdeleyen çeşitli analizler, alan araştırmaları yapılmıştır. Hangi göstergenin ne ölçüde etkide bulunduğu da ayrı bir irdeleme konusu olarak değerlendirilebilir. Bu çalışmada, illerin gayrisafi yurtiçi hâsıla (GSYH) verileri ile göç verileri arasında bir istatistiksel anlamlılık ilişkisi kurularak, ekonomik faktörlerin göç hareketlerine etkisi üzerine istatistiksel bir değerlendirme yapılmaktadır. Gayri safi yurtiçi hâsıla verisinin kullanılmasının nedeni, bu göstergenin genel ekonomik göstergelerin bir bileşkesi olduğu varsayımıyla hareket edilmesidir.

Yöntem:

Bu çalışmada, illerin GSYH değerleri ile net göç alma-verme sayıları ilişkilendirilerek, benzerlik matrisine göre kümeleme işlemi gerçekleştirilmiştir. GSYH değeri yüksek olan illerin göç alma oranlarının, GSYH değerleri düşük olan illerin ise göç verme oranlarının yüksek olma beklentileri ilişkilendirilerek, kümeleme analizi yardımıyla sonuçlar değerlendirilmiştir. Bunu yaparken, 2010-2019 yılları arası illerin kişi başına düşen GSYH verileri ile aynı yıllara ait illerin göç verileri (göç alma oranları, göç verme oranları) kullanılmıştır. Böylece iller, hem göç alıp verme oranlarına göre hem de gelir seviyelerine göre dörder gruba ayrılmış, yüksek gelir seviyesine sahip illerin göç alan grupla, gelir seviyesi düşük olan illerin göç veren grupla olan uyumları incelenmiştir. Bu kapsamda iller, göç alma/verme durumuna göre 'yüksek düzeyde göç alan', 'göç alan', 'yüksek düzeyde göç veren', 'göç veren' şeklinde dörtlü bir sınıflamaya tabi tutulmuştur. Aynı paralelde iller, 'düşük GSYH', 'orta düzey GSYH', 'yüksek GSYH' ve 'çok yüksek GSYH' olmak üzere dörtlü gruba ayrılmıştır. Gruplar arası uyum analizi bu çerçevede gerçekleştirilmiştir.

Bulgular:

Kümeleme analizi sonuçlarına göre GSYH değeri düşük ya da orta olarak belirlenen, Grup 0 ve Grup 1'de yer alan 67 il, net göç değerleri bakımından fazla ya da çok fazla göç vermiş gruplarda yer almıştır. Beklenen gruplarda yer alma performansı yaklaşık %93 olarak ölçülmüştür. Bu veriler, gelir yaratma potansiyeli düşük olan illerin tamamına yakınının göç verdiğini göstermektedir. GSYH değeri yüksek olan Grup 2 ve Grup 3'te yer alan illerin beklenen gruplarda yer alma performansı yaklaşık %65 olarak gerçekleşmiştir. Bir başka ifadeyle, GSYH değerleri yüksek illerin önemli bir kısmı aynı zamanda göç alan ya da yüksek göç alan iller arasında yer almaktadır. GSYH değeri yüksek olup göç alan gruplarında yer almayan illerin ise genellikle büyükşehirlere yakın konumda bulunan iller olduğu tespit edilmiştir. Bu iller, büyükşehirlere yakın konumları dolayısıyla gelir transfer edebilen, ancak aynı yakınlık nedeniyle bu büyükşehirlere göç veren niteliğe sahiptir. Kümeleme analizi sonucunda ortaya çıkan genel uyum oranı ise %79 olarak belirlenmiştir. Göç hareketlerinin büyük ölçüde gelir yaratma potansiyeli yüksek olan illere yöneldiği görülmektedir. Özellikle İstanbul, Ankara, İzmir, Bursa, Kocaeli gibi anakentlerin hem çok yüksek düzeyde göç aldığı, hem de yüksek düzeyde katma değer ürettiği net bir biçimde sonuçlara yansımıştır.

Sonuç ve Tartışma:

Çalışmamızın temel varsayımı olan kişi başına düşen Gayrisafi Yurt içi Hâsıla düzeyi yüksek olan illerin göç aldığı, düşük olan illerin ise göç verdiği yönündeki ön kabul %79 oranında doğrulanmıştır. Göç alan iller arasında GSYH değeri düşük herhangi bir il bulunmamaktadır. GSYH değeri yüksek illerin de büyük bir kısmı aynı zamanda göç alan illerden oluşmaktadır. Bu sonuçlar, ülkemizde gelir yaratma ya da katma değer üretme potansiyeli yüksek olan illerin göç alma oranlarının da yüksek olduğunu ortaya koymaktadır. Tersinden bakıldığında, göç alma oranları yüksek olan illerin daha yüksek gelir yaratma ya da katma değer üretme imkânına kavuştuğu da söylenebilir. Bu durumda, bu iller yüksek gelir yaratma potansiyeliyle mi göç almaktadır, yoksa göç alabildikleri için mi yüksek gelir yaratabilmektedir sorusu gündeme gelmektedir. Kanımızca bu yapı, birbirini besleyen süreçlerin bir sonucudur. Yani bu iller, sahip oldukları bazı nitelik ve imkânlarla, hem göçün yöneldiği cazibe merkezleri olduklarından göç almaktadır, hem de göç alma potansiyeline sahip olmaları nedeniyle yüksek katma değer yaratabilmektedir. Çalışmamız, göçün en önemli nedenleri arasında görülen ekonomik etmenlerin göç verileri üzerindeki güçlü etkisini GSYH verileri üzerinden ortaya koymaktadır.

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1. INTRODUCTION

The phenomenon of migration, which can be defined as the population mobility of human communities from one place to another, is as old as human history. So much so that the history of humanity may be written as the history of migrations (Koçdemir, 1999, p. 86). Migration is the movement of individuals in the society between their own settlement areas and another settlement area, in order to live and settle. The decision to migrate may be taken by individuals' own preferences, or it may manifest itself as a necessity imposed by socio- economic or political conditions.

Since the urban (city) is a functionally multidimensional concept, it can be defined in various ways. The urban is a concept with economic, social, political, cultural and demographic dimensions. For this reason, the definition of urban and the approaches to the concept of urban differ. The city hosts a continuous social transformation; meets social needs such as settlement, shelter, transportation, work space, resting place, entertainment place. Agricultural activities are carried out at a very limited level in urban. Because of these reasons the city can be defined as a settlement with a high population density compared to rural areas (Keleş, 1998, p. 12).

Urbanization is the process of shifting the population density to cities as a result of the development of non-agricultural activities and industry (Ozankaya, 1975, p. 63). In other words, urbanization is the process of accumulation of population in cities due to the request of people to live in urban settlements in parallel with the increase in the production of goods and services.

It has been observed throughout the history of humanity that human societies have displaced in order to meet their social needs. The main factor of determining the direction of migration movements is the answer of that question: Where human beings can meet their vital needs more easily? Especially after the Industrial Revolution, the fact that the city gained importance over the countryside and the intense population mobility towards the cities constitutes the basic dynamic of the migration phenomenon. There are many researches, opinions and evaluations in the literature on migration, which develops in parallel with the transformation of production relations.

In almost all societies, the direction of migration takes place from rural to urban and from underdeveloped regions to more developed regions. This structure constitutes the basic dynamic of the urbanization process. The city has been shaped according to the function it has assumed in the historical process and has built an ' urban identity ' specific to each period. Rural to urban migration movements are mostly based on the driving and attractive forces emphasizing the differences in characteristics between the city and the countryside. Evaluations on development are handled mostly in the context of economic development.

However, economic relations and economic characteristics alone are not decisive in explaining the phenomenon of migration. Mostly, more than one factor play a role in the emergence of migration. Many variables such as security, health, personal preferences may be more or less decisive in making the migration decision.

This research examines whether there is a statistically significant relationship between the migration data of the provinces and their income levels, in order to reveal the determinant of the economic factors, which are among the most important reasons for migration.

2. THE PHENOMENON OF MIGRATION AND THE URBANIZATION

Migration movement may be within the country (internal migration) as well as internationally (external migration, out-migration). Internal migration manifests itself as population mobility for the purpose of settling in one of the other settlements within the same country. Although the direction of internal migration generally takes place from smaller settlements to the urban, it may also take place from a city to another city or from the city to the countryside.

On the other hand, external migration refers to the movement of population from one country to another. Generally, it may be for political reasons such as asylum, political asylum, or it may happen for economic reasons. Migration from our country to Germany and neighboring countries is an example. Political instability, the pressures of authoritarian regimes on society, civil war or war with other countries are among the most important reasons for external migration. The instability process in Syria, which has been going on for many years and has had a significant impact on our country, is the most up-to-date and vivid example of this.

One of the most well-known reasons for external migration is geographical discoveries. There has been an intense migration movement towards the discovered geographies (Güvenç, 1996, p. 198). In the 19th century, the

population increase in the newly discovered places such as the USA, Canada and Australia was much higher than the increase in Europe (Tanilli, 1997, p. 317).

The direct effect of external migration on the urbanization process remains limited. The main factor is internal migration for urbanization. Generally, in the explanation of the migration phenomenon, a framework is drawn between the repulsiveness of the rural and the attractiveness of the urban. And population mobility is examined on this basis. This framework is contained in a wide range, from the request to improve socio- economic, cultural and political conditions, to the request to benefit from services such as health and education (Öner & Kaçmazoğlu, 1997, p. 371). Due to the existence of repulsive and attractive reasons, it is stated that migration is an inevitable situation, no matter what precautions are tried to be taken (Akkaya, 2002, p. 203). Migration is not only a result of economic, cultural, social and political transformations but also causes some social, economic, cultural and political consequences (İçduygu & Sirkeci, 1999, p. 250).

The city is a settlement style of which has own legal management device; has the ability to form a center; both in the collection and distribution center position; out of agricultural production; controls the economic activities; It is a preferred settlement with its unique lifestyle based on division of labor and specialization (Suher, 1995, p. 9).

Throughout human history, urban has had various functions. The dynamic that is effective in the functional transformation of cities is the transformations in the network of production relations. Throughout the history, the structure and function of urban have been shaped according to the role that the network of production relations has assigned to it (Hatt et al., 2002, p. 31). Whether the city is an administrative center or a place where the network of economic relations is settled, institutionalized and managed is determined by the dominant economic system of that period.

Among the most important factors affecting the development of urban is the location of the city in terms of spatial division of labor. This role is redefined in every developmental period and sometimes undergoes radical changes. While each period creates its own economic structure, it also determines the local, social and spatial structure. This structure also directly affects the structuring of the next period (Ersoy & Şengül, 2001, p. 11-12).

According to Keleş (2002, p. 75), who defines urban by making a classification according to the source of economic relations, more than half of the population must be working in non-agricultural sectors in order for a place to be defined as a city. In other words, settlements of which income is mostly met from non-agricultural sectors are defined as cities.

Kartal (1987, p. 5) defines urban as places that have reached a certain level of volume, density, heterogeneity and integration with the effect of technological development, where non-agricultural production is carried out, where the entire production and distribution process is supervised and coordinated. According to another definition the city is a settlement where a group of people living together occupied, managed, and organized to be settled (Kilicbay, 2000, p. 29).

Although the city is not self-sufficient in terms of economic relations, it is a settlement area that controls the economic activities of the surrounding settlements, determines the specialization process accordingly, carries out its production within this framework. As a result of this process, it gains a social and administrative supervisory identity (Ortaylı, 1979, p. 194–195).

According to Massey 's approach known as 'geological metaphor ', each period creates its own structure, and this structure is both shaped by taking the previous period as a reference and also as a source for the next period. This process has the potential to initiate a new urbanization period (Şengül, 2009, p. 98-99).

Before the Industrial Revolution, urban had the appearance of a general administrative center or a place where small-scale commercial relations were carried out. However, with the Industrial Revolution, it has become a settlement located in the center of economic activities and surrounded by developed places and factories. Thus, in the modern sense, urban has emerged with its own values, social and economic relations.

For instance, in Medieval Europe, churches, squares, bazaars, a limited number of residences around them and the walls surrounding them formed the image of cities. After the Industrial Revolution, the dominant image of the city was formed by the factories and the residences which workers lived with their families (Ertürk & Okan, 2001, p. 55).

Yerasimos (2005, p. 320) defined urban in our country, according to two historical periods: before capitalism and after the 19th century. In the pre-capitalist period, urban is the place where the bureaucracy, which dominates the socio- economic structure of the country and does not have the means of production and labor force, is settled and the resulting wealth is consumed. In the period after the 19th century, urban became the place where both the wealth entered the country with luxury goods, debts and other commissions, and the assets were sent abroad in the form of installments of goods and debts.

However, it would be wrong to evaluate urbanization by reducing it to just a population mobility. In addition, urbanization is a result of some socio- economic, political and technological changes, and it has the power to influence socio- economic, political and social structure, human attitudes and behaviors (Kartal, 1987, p. 22). In other words, it has the characteristics of being both cause and effect.

Urbanization refers to a process in which the scale, scope and social meaning of residential areas are transformed. The urbanization process primarily provides the transformation of daily life. On the other hand, this process is a new business area that opens new investment areas, enables different types of units, and offers new employment opportunities to labor of various qualifications. (Erder, 2001, p. 122).

For people as the main subject of social life, the urbanization process brings another important social reality: 'urbanizing'. Urbanization, as a result of urbanization, is a new process that creates the change on human behavior and relationships, value judgement and personal lifestyle (Keles, 1998, p. 86).

Urbanizing, which is defined as the change that occurs in the social behavior and relations of the individual who has left his settlement and settled in the city, includes an identity transformation. This transformation affects values, behavior patterns, social practices and daily life and defines a new individual (Genç, 1997, p. 312-313).

It is possible to examine the urbanization process separately, economically and socially. From an economic point of view, it is possible for the individual to earn his living completely by working in the city or in jobs specific to the city. However, from a social point of view, urbanizing refers to the adoption of urban-specific attitudes and behavior patterns, social and spiritual value judgments on some issues (Kartal, 1992, p. 50).

The urbanization process, which is defined as the production process of the urban area on the social base and the urban lands becoming the site of social reproduction, is naturally fed by these migration movements. The economic reasons that affecting the urbanization process are mainly due to the differences in the rural-urban divide. Factors that make the urban attractive or make the rural inadequate are among the economic reasons for the urbanization process.

Some of the economic reasons are the reasons that push the rural population out of the rural area, arising from the conditions of the agricultural structure. These are called 'repulsive factors' or negative causes of migration. The use of modern tools in agricultural production activities, the mechanization process, the abandonment of primitive methods, the increase in the use of new inputs in agricultural production have reduced the need for agricultural labor. People who cannot benefit from the socio- economic opportunities in the rural areas and cannot meet their expectations, tend to urban, thinking that they can obtain these opportunities in the city. In this case, 'attractive factors' or positive migration reasons are mentioned. Especially the fact that labor opportunities are more and more diverse in cities is one of the most decisive economic reasons (Keleş, 2002, p. 27-28).

Some of the factors that directly affect urbanization are technological. Technological development and the effects of the share taken from this development in rural and urban areas are directly reflected in urbanization. Due to the mechanization in agriculture, the decrease in the need for human and animal power in agricultural activities (shift from the use of organic energy sources to the use of non-organic energy sources), is one of the important reasons for migration (Tekeli, 1982, p. 94).

One of the technological factors affecting the urbanization is technological advances that increase communication and transportation opportunities. The development of transportation facilities has led to an increase in population movements between settlements. It can be claimed that the advances in communication opportunities have a significant impact on introducing the city and urban life to people living in rural areas (Özer, 1998, p. 239).

The city is both the place of production and the place of consumption of technology. Today, the majority of scientific studies and interventions are aimed at meeting the needs of urban life. Thus, the place of using the possibilities offered by technology is also the city. This is another factor that makes the city attractive.

One of the most important factors that directly affect the urbanization process is political decisions and legal structure. Factors, such as the decisions taken in a country, the qualities of the administration and the nature of international relations play a decisive role in urbanization.

For instance, during the Atatürk's Era, the spread of the industrial facilities established by government and the policy of expanding the railway transportation, played a decisive role in terms of the direction of migration in the urbanization (Kartal, 1987, p. 8-9). Another example is that the New Towns Act 1946 in England caused the population movement towards London to shift to the surrounding cities (Keleş, 2002, p. 29).

One of the political decisions that affect urbanization is the policies applied towards agriculture or industry in the country. Plans, land reforms, development programs are ultimately the products of the decision-making mechanism, and they play a decisive role in urbanization.

As an example, the liberal policies implemented in the post-1950 period and the industrial investments directed towards metropoles were a significant determinant of migration movements (Kartal, 1987, p. 9). Political effect on urbanization are not limited to national decisions. For instance, the transformation in the capitalist accumulation process with globalization has led to the concentration of investment and employment in certain countries, regions and cities in the world (Ataay, 2001, p. 53).

After 1980, neoliberalism also defined the structure and function of urban. In 'World Cities System', the city, which was the place where collective consumption was organized and labor was reproduced in the old period, has become a place where the flexible production model has become widespread by increasing the profit rates of transnational companies. In this hierarchical system, global cities (such as New York, London, Frankfurt, Tokyo) are located at the top which are connected with each other. These cities keep under control the world through communication channels where the financial sector is developed and the production of goods and services. Other cities are also under the control and direction of these global cities. As the determinant and guide of the system, international capital provides a certain direction for cities around the world in order to integrate into system by the model called 'competitive localities/cities' (Doğan, 2001, p. 99-100).

Socio- psychological factors, which are also expressed as attractive factors generally, also directly affect the urbanization. These factors are mainly caused by the differences between rural and urban settlements. Perceiving style of the elements that make urban attractive and make rural repulsive define socio- psychological structure of urbanization. Some of socio- psychological reasons of urbanization are labor opportunities; high wages; cheap and fertile land; career opportunities; expansion of social opportunities such as education and health; easy access to abundant and various food products; the opportunity to live in more comfortable homes; safe and peaceful living conditions; etc. (Keleş, 2002, p. 26-27).

In the primitive period, the tribes lived in constant motion as they sought climatic and natural conditions suitable for their nutritional and shelter needs. This was the basis of the nomadic society. Issues such as the fertility of the soil, favorable climatic conditions, and sheltering opportunities were the main determinants (Kocacık, 1996, p. 137).

It is stated that the discovery of grain cultivation, plows and domestic animals after the establishment of settled agriculture played a major role in the formation of the first urban-type settlements. People started to live out of agricultural area but nearby places where agricultural products are traded. On the other hand, there are also opinions that the emergence of the city took place with the settlements where religious ceremonies and rites were performed and mausoleums were built. For example, Bookchin (1999, p. 52) argues that the first urban center was not a marketplace, but a ceremonial area where natural gods and powers were worshiped, based on the idea that the first archaeological finds belonged to structures such as burial places and temples.

Rifkin (1997, p. 166) attributes the birth of cities to the beginning of hard grain cultivation. In this context, Rifkin supports the view that settlements where agricultural products are traded reveal the city.

In the pre-capitalist period, the superiority of rural, which was the source of agricultural surplus and labor, over the city in the feudalism of the Middle Ages stands out. It is seen that there were craft and trade activities in the cities. Considering that these activities were also very limited in the early periods, it can be easily said that urban was a settlement fed by the rural. In this period, the cities were in the form of administrative centers where no production was made. Over time, with the development of trade and the opening of new trade routes, cities have become places that hold the monopoly of exchange and have become economic exploitation of rural with these

qualities. Thus, urban began to sit at the center of the economic accumulation process and as the new capital class, urban merchants began to gain importance in terms of social life. The rise of this class played a leading role in the disintegration of the feudalism (Kaygalak, 2007, p. 6-17).

Not only this process led to the transformation of property relations, but also it caused the dispossessed small producers, who were dispossessed due to this transformation, to migrate to the metropoles. The city, which has continued to be the administrative center, has experienced the political centralization process due to the increasing and diversifying needs of the growing population. The existence of cities before the Industrial Revolution is based on their being a market for food products and raw materials purchased from abroad. At the same time, these cities were also the manufacturing bases of handicrafts. The city was also the focal point of the political, religious and educational spheres (Sjoberg, 2002, p. 39).

In the 1900s, with the effect of the Industrial Revolution, there were significant changes in the structure and functionality of urban. The city, which became the center of industrial production, began to attract a significant population from rural. The city was reshaped as a settlement consisting of factories where production was made and the residences where these workers lived (Kaygalak, 2007, p. 22). The main reason for migration from rural to urban is the movement of societies that want to be a part of this production activity to the city.

Migration is a phenomenon that follows a parallel course with the historical transformation of production relations. According to Tekeli (1998, p. 11), the displacement of a person has three distinct consequences for the relations of production of industrial society: the displacement of labor; displacement of money (capital); displacement of the market (consumer).

One of the most important factors in the growth of the industry has been the labor accumulated in the cities. Due to social phenomena such as lands fencing and the collapse of village labor, England has had large populated cities since the 1830s. This process has led to intense urban population growth in European cities, especially in England (Kaygalak, 2007, p. 23).

The functioning of the urbanization in Turkey is different from developed countries. Urbanization in Turkey has characteristics specific to underdeveloped countries. Unlike developed countries, urbanization in Turkey has emerged not as a result of industrialization, but rather as a result of the accumulation of the population exceeding the capacity of the cities to meet socio-economic activities (Keleş, 1974, p. 27).

One of the most important features of Turkey's urbanization experience is that it embodies an endless process of change, destruction and reconstruction (Işık & Pınarcıoğlu, 2002, p. 95–96). As a result of the modernization policy in agriculture that started with the Marshall Aids in Turkey and the development policies based on the export of agricultural products, the increasing population in the rural areas migrated for economic, social and political reasons (Şengül, 2009, p. 122). The direction of migration may be from the interior to the coast, from the east to the west, from rural to urban, from urban to urban.

Urbanization in Turkey has not led to the growth of all cities at the same rate, and population agglomerations have emerged in cities that are relatively industrialized or have developed service sectors. While Istanbul, Ankara and Izmir ranked first, this process also took place in cities such as Adana, Bursa and Izmit in the following periods (Keleş, 2002, p. 56).

The date that can be considered as the turning point of the internal migration movements in Turkey is the second half of the 1940s. As a reflection of this, the years when the intense population growth started to be seen in the cities were the 1950s. It is not correct to talk about large-scale urbanization in the first years of the Republic. Until the 1950s, the rate of urbanization was low (Keleş, 2002, p. 31). Turkey's economic outlook was one where the majority of the population lived in rural areas and agricultural production was more concentrated until the 1950s.

The name of the economic policy envisaged in the first years of the Republic was 'national economy'. Its aim was to develop the country with the enrichment of people and to replace the foreign entrepreneur with a domestic private enterprise. This policy is defined by Cem (1989, p. 279) as a liberal policy with the appearance of statism. It is seen that some investments were made and factories were established in this period. However, it should be noted that the majority of enterprises established in this period were makeshift facilities rather than factories (Aydemir, 2000, p. 397).

It is known that since the first years of the Republic, policies towards the establishment of a central state structure and the creation of a single national identity were carried out in the nation-state formation process. As a result of this policy, three of the most important socio-spatial events of the period took place: the establishment of a new administrative center with the declaration of Ankara as the capital, the decisions taken on where the SEEs would be established, and the creation of the transportation network that prioritized Anatolia (Şengül, 2009, p. 113-114).

The failure of the liberal policies of the first period, or rather the failure to achieve the desired result, led to a tendency towards the policy of statism. With the 1930s, the policy of statism began to be implemented. It can be said that social and economic policies such as statism and populism in the 1930s formed the basis of the accumulation of urbanization in Turkey (Keskinok, 2004, p. 54).

The implementation of the statism policy, which is an important turning point for the Turkish economy, was ensured by the inclusion of the principle of statism in the program of the Republican People's Party in 1931 and in the Constitution with an amendment made in 1937. In order to realize this policy, the confidential Council of Ministers Decree titled "Inspections and decisions regarding industrial facility and operation reports" dated 11/04/1934 has been put into practice. Then the "First Five-Year Industry Plan/Program" came into effect (Tezel, 1993, p. 1– 3).

Unlike the economic policy that was tried to be implemented in the previous period, this plan aimed to provide development not with private initiatives, but with public investments. Laying of railways, investments made by institutions such as Sümerbank, Etibank and Madencilik Bankası (Mining Bank) in the paper, textile and sugar sectors are the main gains achieved in this period. (Cem, 1989, p. 295).

The effect of this period on urban is that the newly established factories caused an urbanization process in the places where they were established. In 1938, with the new unit belonging to the Bakırköy factory, new fabric and cotton yarn factories were put into operation in Kayseri, Nazilli and Konya Ereğli. The construction of the Malatya combine was completed in 1939. Merino wool yarn factory in Bursa and rayon factory in Gemlik were completed. Paper factory in Izmit, bottle and glassware factory in Istanbul Paşabahçe, rose oil factory in Isparta, Keçiborlu sulfur mine and Zonguldak semi-coke factory started production. With the projects added to the program later, new factories were established in Sivas and Izmit. Between 1934-1938, other projects were added to the Program. The most important of these, the cement factory, was opened in Sivas (1943), and the second paper and acidic kaolin factory was opened in Izmit (1941-1944) (Tezel, 1993, p. 13-14).

These institutions have led to the development of the places where they were established and to gain the character of a city. The beginning of the transformation of settlements such as Kayseri, Malatya and Sivas, which were considered as city centers only as an administrative division in the previous periods, from their rural appearance to today's cities, took place with the establishment of these enterprises. There is a cash wage structure in these factories, albeit at a limited level, with health services and social facilities that the country in general lacks completely (Yerasimos, 2005, p. 422). This shows that not only the urban proletariat, but also the urban life began to form.

In summary, the basic principles and objectives of urbanization practices in the 1930s can be listed as follows: national integration (in terms of rural-urban, interregional and agro-industrial integration); development of underdeveloped regions and rural development; central planning and organization; development of public services and urban development on expropriated lands (Keskinok, 2004, p. 64).

Especially in the post-Atatürk period, the progress began to be interrupted by the negative effects of the pre-World War II period. Due to increasing inflation and economic contraction, problems were experienced in the economy, which was already weak, and investments for development had to be stopped. The policies of this period were aimed at integrating the country into the world economy as an agricultural country. In this structure, Turkey has become a country that sells agricultural products and mines and buys industrial products in return. The transportation infrastructure and layout were designed in accordance with this structure. In this way, agricultural production was developed and transportation infrastructure was created, thus opening to international markets through Anatolian cities. The cities in question were able to develop, albeit a little. (Ataay, 2001, p. 57).

With the effect of the 1929 World Economic Depression, import substitution industrialization policies were developed in the 1930s. Imports of some industrial establishments and some basic consumer goods established in this period were limited (Sönmez, 1992, p. 58). This process has led to the social, economic and cultural

development of some Anatolian cities. During this period, the distribution of the population across the country became relatively balanced. As a result, in 1927 there were 5 cities with a population of more than 50,000, while in 1950 this number increased to 11 (Şengül, 2009, p. 115).

In this period, it is seen that the weight of the country's economy continues to be in the agricultural sector. Urbanization rate has also remained at a low level. The agricultural and land policies implemented in this period had an impact on urbanization. With the mechanization of agriculture, a labor surplus began to emerge. However, the level of industrialization in urban remained well below the mechanization in agriculture and the cities were insufficient to meet the increasing labor from rural (Yerasimos, 2005, p. 393). Thus, the first alarm bells began to ring for Turkey in the urbanization process.

II. The post-World War II period is a period of rapid urbanization not only for Turkey but also for underdeveloped countries (Keleş, 2002, p. 35). This situation is related to the role that the new international system imposes on peripheral countries. This is the period when the multi-party system started in Turkey and the Democrat Party government was in power since 1950. The emphasis was placed on international expansion policies, the industrial sector was supported, the mechanization process in agriculture was experienced, and it was aimed to provide the demanded labor by encouraging migration to metropoles where industrial establishments are concentrated.

In this period, population growth and migration mobility in cities increased the need for new housing and settlement (Erder, 2001, p. 124). However, the insufficient level of economic development prevented this need from being met. Thus, the acceleration of urbanization and the fact that this acceleration became a problem emerged as two parallel processes. Import substitution policies implemented since 1954 directly affected population movements (Boratav, 1989, p. 86). In addition to the fact that the surplus labor force in rural areas is directed to the cities, it has been observed that migration from other small cities, especially Istanbul and its surroundings, to the metropolises has intensified (Ataay, 2001, p. 62).

In this period, the government displayed a passive attitude against urbanization and was content with making small-scale interventions to the dynamics in the market instead of predetermining the direction of the developing events (Işık & Pınarcıoğlu, 2002, p. 111).

In the post-1960 period, import substitution policies were institutionalized with the planned period and the break from rural areas continued in parallel with the increase in production in the industrial sector. However, in this period, urbanization could not progress in a balance, as the economic development was far below the level to meet the surplus of labor in agriculture. The urbanization process, which was not based on solid foundations from the beginning, showed itself as a problem from the first years. Since urban settlements are far from meeting the needs of the masses who come to the city to find a job (Tezel, 1993, p. 47), they have negatively affected the socio-economic structure and welfare level of the city.

Despite the increase in the rate of urbanization, the governmental tendency to keep urban investments to a minimum in the import substitution period resulted in the urbanization process being left to the initiative of local communities more. This caused the new residents of the city to respond to the housing problem with slums. At the same time, the reaction of the new residents of the city to the unemployment problem, which has become a major problem with the migration to the city, was to establish an informal economy apart from the city's formal economy (Şengül, 2009, p. 123).

The problem of squatting emerged as a result of this condition. Slums are settlements in underdeveloped countries where rapid urbanization is experienced, they are built without permission on other people's lands, lack infrastructure, are far from the city, cannot benefit from social opportunities such as health and education (Keleş, 1998, p. 214; Geray ,1968, p. 12). These settlements are a part of the city as they are articulated with the city with various urban functions (Geray, 1968, p. 12). Kıray (1982, p. 339) attributes the emergence of such residential areas to the fact that the production does not increase at the same level despite the concentration of the population living in the cities.

Undoubtedly, one of the factors causing the problem of squatting is the inadequacy of housing policies in Turkey. Housing problem in Turkey has not been seen as a social service for many years. It can be said that governments have almost no policy in this regard (Yerasimos, 2005, p. 312). It is inevitable to encounter the problem of squatting in the face of current conditions.

Population projections for the years 1963-64 are remarkable in that they show the point reached by squatting in this period. In the four largest cities (Istanbul, Ankara, Izmir and Adana) and in nine cities with rapid development, it is seen that 1 million 800 thousand people live in slums devoid of the simplest health conditions. 1 million 590 thousand of these people lived in four big cities. The number of people living in slums in these cities comprised 60% of the population of Ankara, 45% of the population of Istanbul, 34% of the population of İzmir and 45% of the population of Adana (Yerasimos, 2005, p. 394).

Işık and Pınarcıoğlu (2002, p. 113-118) refer to the slums in the 1960-1980 period as the first period slums. He defines these slums as the houses that people who came with the first migration movements from the village to the city built with their own hands and generally on treasury lands just to manage their own lives. There was the existence of network-type relations arising from fellow/townsmenship. Most of these slums have not survived. One of the distinguishing features of urbanization in this period was the 'apartmentalization' process. This process, which is the opposite of slum-type housing, is a part of the formal-informal development of urbanization in Turkey, as it is experienced in parallel with the squatting process. The locomotive of the apartment process was 'build-and-sell', which had its golden age, especially in the 1960-1970 period (Işık & Pınarcıoğlu, 2002, p. 102-106).

When the plans prepared in this period are examined, it is seen that effective measures were not taken for the urbanization problem. Although a number of measures were superficially listed, there were no consistency between the plans. For example, the First Five-Year Development Plan prepared for the 1963-1967 period adopted the principle of "optimal city size" and emphasized that the overgrowth of big cities should be prevented (DPT, 1964). Another prominent principle in this plan was the reference to the 'balance between regions'. It was emphasized that necessary measures should be taken to eliminate interregional development disparities in Turkey and that interregional balance should be observed in the planning of investments (Keleş, 2002, p. 77).

Second plan (1968-1972), unlike the first one, encouraged the further growth of metropolises and emphasized that this growth should be balanced and planned (DPT: 1969). The third one (1973-1977), unlike the other two plans, preferred to plan urban development by identifying priority areas (DPT, 1974).

When we look at the urbanization outlook of Turkey in this period, it is seen that there was a gradation resulting in four metropolitan cities (Yerasimos, 2005, p. 389). Istanbul alone brought together the industrial, commercial and financial activities of the country. Ankara, as the capital, has the authority to make political decisions. Due to its geographical location, İzmir was the main port of the country's exports. And Adana was the country's most important agricultural center.

The 1980s marked the beginning of a radical change and transformation process for the whole world and Turkey. This process, which means the transition to the neo-liberal era, is a new page in Turkey's political, social and legal history, as well as a new page in the urbanization process in Turkey. The effect of this process on the city in Turkey has been that the capital withdrawn from the production area with the abandonment of the import substitution policy implemented in the previous period, tended to both financial markets and to get a share from the rent of urban (Doğan, 2001, p. 98-103).

The change in settlement means the redistribution of capital and labor and, accordingly, the areas of production and consumption. While settlements with the most favorable conditions have developed in terms of capital groups, sectors and sub-sectors, a decline is observed in areas other than these. As a result, the capital accumulation process will decide who will invest in which sectors, at what scale and where, and who will employ them (Ataay, 2001, p. 54).

3. DATA SETS AND METHODOLOGY

In the cluster analysis, it is not possible to make assumptions about the future, since the instantaneous state of the units is observed (Jhonson & Wichern, 2007, p. 675). The main purpose of cluster analysis is to group objects in such a way that they are similar (homogeneous) within the group and different (heterogeneous) between groups. Cluster analysis, one of the unsupervised learning methods, is not based on predetermined groups. (Hair et al., 2006, p. 318).

The assumptions of the cluster analysis are similar to the assumptions of the factor analysis. While selecting the sample, variables should be chosen so as not to cause bias and extreme values should not be included in the data set. Care should be taken to ensure that the variables are in the appropriate unit of measurement (continuous

numerical, discrete numerical or coded qualitative measurement). It is important to ensure multiple normality and sufficient sample size and it is expected that there will be no multicollinearity between the data (Sümbüloğlu, 2009, p. 62). In cluster analysis, multicollinearity is a weighting process that cannot be observed by the researcher but affects the analysis. If there is a multicollinearity problem between the variables, two ways should be used. The first of these is to equalize the number of variables in each group or to combine highly correlated variables as a different variable; the second is the use of a distance measure, such as the Mahalanobis Distance, to balance this correlation (Hair et al., 2006, p. 319).

In cluster analysis, similarity and distance measures are determined depending on the type of variable. Which distance or similarity measure to use is decided according to the measurement (such as discrete, continuous) and scale (such as nominal, ordinal) types of variables. The distance measures used for variables in interval and ratio scales are Euclidean, Manhattan, Pearson, Minkowski, Mahalanobis measures (Garson, 2014, p. 243).

Euclidean Distance:

$$d(i,j) = \sqrt{(x_{i1} - x_{j1})^2 + \left(x_{i2} - x_{j2}\right)^2 + \cdots + (x_{ip} - x_{jp})^2} \quad (1)$$

Pearson Distance:

$$d(i,j) = \sqrt{\left(x_{i1} - x_{j1}\right)^2 / s_1^2 + \left(x_{i2} - x_{j2}\right)^2 / s_2^2 + \cdots + \left(x_{ip} - x_{jp}\right)^2 / s_p^2} \quad (2)$$

Manhattan Distance:

$$d(i,j) = \left(|x_{i1} - x_{j1}|\right) + \left(|x_{i2} - x_{j2}|\right) + \cdots + \left(|x_{ip} - x_{jp}|\right) \quad (3)$$

Minkowski Distance:

$$d(i,j) = \left[\left(|x_{i1} - x_{j1}|\right)^m + \left(|x_{i2} - x_{j2}\,|\right)^m + \cdots + \left(|x_{ip} - x_{jp}\,|\right)^m\right]^{\frac{1}{m}} \quad (4)$$

s_p value is the variance of the variable for which the distance is calculated. In Minkowski distance measure, if m=1, the formula becomes Manhattan distance measure formula, if m=2, it turns into Euclidean distance measure formula (Garson, 2014, p.244). If there is a high correlation between two variables in the data set, another distance measure to be used is the Mahalanobis distance measure. With this method, the variance, covariance structures and direct connection between the variables are examined. It is used more frequently than other methods because it also calculates outlier observations.

Mahalonobis Distance is calculated with the formula (Sharma, 1996):

$$d(i,j) = \sqrt{\left(x_{i1} - x_{j1}\right)' / s_1^{-1} \left(x_{i1} - x_{j1}\right) + \left(x_{i2} - x_{j2}\right)' / s_2^{-1} + \cdots + \left(x_{ip} - x_{jp}\right)' / s_p^{-1}} \quad (5)$$

Researchers tend to choose parametric tests, which have stronger statistical power and effect size, and are more resistant to type 1 and type 2 errors. In order to choose between these tests, it is necessary to check whether some assumptions are correct. Especially in cases where the assumption of multiple normality cannot be met, data transformation operations are frequently used. Transformations such as exponential, square root, Box- Cox, Yeo- Johnson, Lambert W are the most frequently used types (Arslan et al, 2019, p. 176).

Clustering methods are divided into hierarchical and non-hierarchical methods. Hierarchical clustering decomposes using the distance values of the observations in the data. Initially, the clusters are treated as the main cluster and then gradually divided into subsets of subsets are made on individual clusters. Hierarchical methods can be listed as full, mean, central, median and 'ward's link' methods. If the researcher has information about the number of clusters or if the number of significant clusters is determined, non-hierarchical clustering method can be applied. In this method, units are first randomly divided into clusters. Then, unit groups are determined according to the cluster determination criteria and the assignment process is made. Non-hierarchical clustering methods can be listed as k-means and maximum likelihood methods (Alpar, 2016, p. 556).

In our study, it was examined whether there is a significant relationship between the migration data of the provinces and the GDP per capita data. In this context, the GDP and Migration data sets of the provinces between the years

2010-2019 were used. The migration data of the provinces by years, which is the first of the datasets used in this study, are announced by TURKSTAT based on the Address Based Population Registration System (TURKSTAT, 2021). GDP per capita data of other dataset provinces are also announced annually by TURKSTAT (TURKSTAT, 2021). The chosen method is cluster analysis, IBM SPSS (Yaşar Arslan et al., 2020, p.230), Studio version 1.1.463 (Campbell, 2019, p. 41) and Rapid Miner Studio version 8.1.0 01 (Hofman & Klinkerberg, 2016, p.162) was used. The variables discussed in the study and their properties are given in the table below.

Table 1. Variables Used in the Study

Variables	**GDP (Numeric)**					**Migration (Numeric)**				
	Years (Numeric)					**Years (Numeric)**				
Provinces (Nominal)	**2010**	**2011**	**…**	**2018**	**2019**	**2010**	**2011**	**…**	**2018**	**2019**
Adana										
Adıyaman										
…										
Yozgat										
Zonguldak										

In this study, the clustering process was carried out according to the similarity matrix by associating the GDP per capita values of the provinces with the net migration numbers. Cluster analysis can be defined as the process of separating objects, observations or variables in the ungrouped data matrix into homogeneous subgroups according to their similar characteristics (Alpar, 2016, p. 516). The results were evaluated with the help of cluster analysis by associating the expectation of high immigration rates of provinces with high GDP per capita values and the expectations of high immigration rates of provinces with low GDP per capita values.

Finally, provinces grouped according to GDP and provinces grouped according to migration data were observed. The basic assumption of the study is that provinces with high income levels have high receiving immigration rates, while provinces with low income levels have high sending immigration rates. According to this assumption, a causal relationship was sought between the distribution of provinces according to income groups and their distribution according to migration rates.

4. FINDINGS

The phenomenon of internal migration in Turkey has been a subject that has been discussed and considered since the 1940s. Numerous academic studies, publications and research have been carried out on this subject. The only numerical data that can be produced on migration are the general population censuses made by the Turkish Statistical Institute (TURKSTAT) and the results of the Address Based Population Registration System announced since 2007. These results are only enlightening about the direction and amount of migration and do not include the reasons for migration.

The inability to produce reliable data prevents the determination of the socio-economic characteristics of immigrants before and after migration, the problems experienced before and after migration, and the creation of a policy for the solution of these problems. For this purpose, the socio-economic development ranking of the provinces was announced twice, in 1996 and in 2003, by the Prime Ministry State Planning Organization. After the State Planning Organization was abolished and the Ministry of Development was established, the same work was carried out by this ministry for 2017. In these studies, an analysis was made in which a total of 58 socio-economic indicators were evaluated for the provinces. These variables were divided into two main categories as social variables and economic variables.

Social variables in these categories are demographic variables, education variables, health variables, infrastructure variables and other welfare variables. Economic variables are divided into subheadings as manufacturing industry variables, construction variables, agricultural variables and financial variables (Kalkınma Kütüphanesi, 2021).

In the literature, many researches, reports and works have been presented under various main headings such as migration, reasons for migration, direction of migration, socio-economic characteristics of migration reasons. The

most important ones in terms of field studies are the Ereğli Research conducted by Mübeccel Kıray in 1962; Kemal KARTAL's research on the changes in human attitudes and behaviors of the urbanization process carried out in 1977; Emre Kongar's research published under the title of 'Research on Turkey'; Kemal Görmez's 'City and Politics' Research; 'The Ümraniye Research' by Sema Erder; It can be listed as the 'Sultanbeyli Research' conducted by Oğuz Işık and Melih Pınarcıoğlu.

Kıray's study, which aims to reveal the characteristics of social life in the place where an iron and steel industry facility that is about to be established in 1962 will operate, is, in Kıray's words, the first urban fieldwork in Turkey. The research deals with social institutions, human relations and ethos in Ereğli (Kıray, 2000, p. 8-9). This research is important as it is one of the first studies showing a relationship between migration and socio-economic development level. However, this relationship has been revealed by making inferences based on the results of the field research. No evaluation has been made on the socio-economic indicators of the place of migration (Ereğli).

Kongar has published three fieldworks titled "İzmir: The Development of the Urban Family", "Kayseri: Social Research for Urban Planning" and "Altındağ: Research on a Settled Slum" under the title "Research on Turkey". (Kongar, 1996, p. 15). In these fieldworks, the characteristics of the post-migration socio-economic relations network and the transformation process were examined. No relationship has been established between migration and socio-economic indicators.

Kartal's research on families who migrated from Çankırı villages to Ankara in 1977 examines the urbanization process and socio-economic changes of immigrants from social, economic and psychological perspectives. The research has been published in a book titled “Urbanizing in Turkey with its Economic and Social Aspects” (Kartal, 1992). The relations of immigrant families with urban and their adaptation to the socio- economic/ socio- cultural transformation process was investigated by this fieldwork.

By the fieldwork he conducted in Ankara's Çankaya, Keçiören and Mamak districts, Görmez examined the political behaviors and integration processes of the people living in cities with different levels of development (Görmez, 1997). The main purpose of this fieldwork was to reveal the political and social behaviors of those who migrated from rural to urban and the transformation process in these behaviors.

The aim of Erder's research, published under the title 'Ümraniye: A City Settled in Istanbul' was, in Erder's words, “trying to understand the dynamics of the new stratification system that has emerged in the urban environment of mass migration”. Within the scope of this research, subjects such as the adaptation of immigrants, their attitudes and behaviors towards urban institutions and events were discussed (Erder, 1996).

Thanks to the Sultanbeyli Research, findings regarding the effects of inequalities in income distribution on urban life and the level of urbanization have been obtained. This research was also published under the title of 'Alternately Poverty: The Case of Sultanbeyli' (Işık & Pınarcıoğlu, 2002).

All these studies aimed to explain the social, economic, cultural and political consequences of the phenomenon of migration and the transformation processes brought by these results in terms of immigrants and places of migration. In addition, all these studies reveal the relationship between migration and development levels to some extent. However, they did not make a quantitative relationship analysis between socio-economic level and migration rates.

A remarkable study was conducted by Gür and Ural, using statistical data analysis methods, aiming to examine the relationship between migration and socio-economic data (2004, p. 35). In this study, an evaluation was made on the basis of repulsive-attractive forces, migration figures of 1990 and socio-economic indicators were analyzed by regression analysis. As a result of this study, a significant relationship was found between the immigration figures and all the data used, except for the number of students per teacher, at a confidence interval of 0.71.

In the following periods, studies were carried out looking for a meaningful relationship between some selected socio-economic indicators and migration data. These studies on the causes of migration and the main factors determining the direction of migration were generally made using socio-economic data. The main reason is the general belief that the main determining factor, especially in internal migration, is closely related to socio-economic factors.

In this study, the relationship between the GDP data of the provinces and the migration figures was examined. The basic logic of the study is based on the assumption that the GDP data of the provinces are actually the result of all other socio-economic data.

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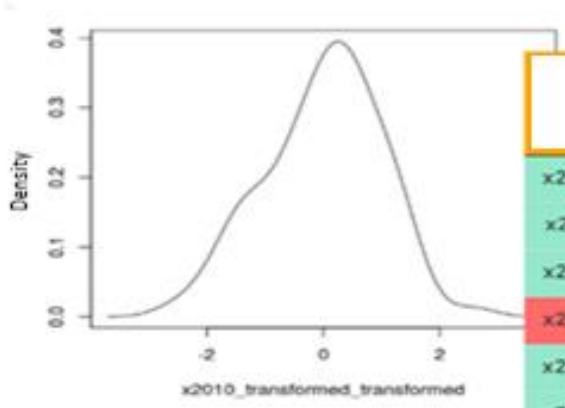
Before starting a scientific research, it is necessary to determine at least how many units are required in order to obtain statistically significant results at the planning stage of the study and to reveal the realization power of a completed research (İnonü University, 2021). The expected values of GDP and net migration by provinces were taken as 8393±2939 and -2.11±13.8 (Mean ± SD) by years. Type I error (alpha) is 0.05 and Type II error (Beta) is 0.20, the power of the test is 80%, the effect size is 4.04 and the alternative hypothesis (H1) is two-sided, the minimum required sample size is 3 in each group, a total of 6.

In the study, a total of 20 groups were formed, 10 for each variable. Then, the preprocessing was started on the data set. First of all, the existence of missing values was investigated and no missing values were found. Then, outliers in the data set were examined. In order for the clustering process to give accurate results, it is important that there are no extremes and outliers. A total of 14 outliers or extreme values were determined by calculating the object distances close to it for each observation with the local outlier factor (LOF), and the values were reassigned by the mean method based on the randomness in the data set.

The assumption of normality is an important criterion in statistical studies. For this reason, Anderson-Darling and Shapiro-Wilk tests, which are normality tests, were applied to the data set. Since the data set did not exhibit a normal distribution, data transformation was performed for the quantitative variables in the data set. Pearson P test statistic was calculated for each variable and the transformation with the lowest test statistic was selected. Multiple normality assumption was provided in the data set by applying the Box-Cox transform (Figure 1&2).

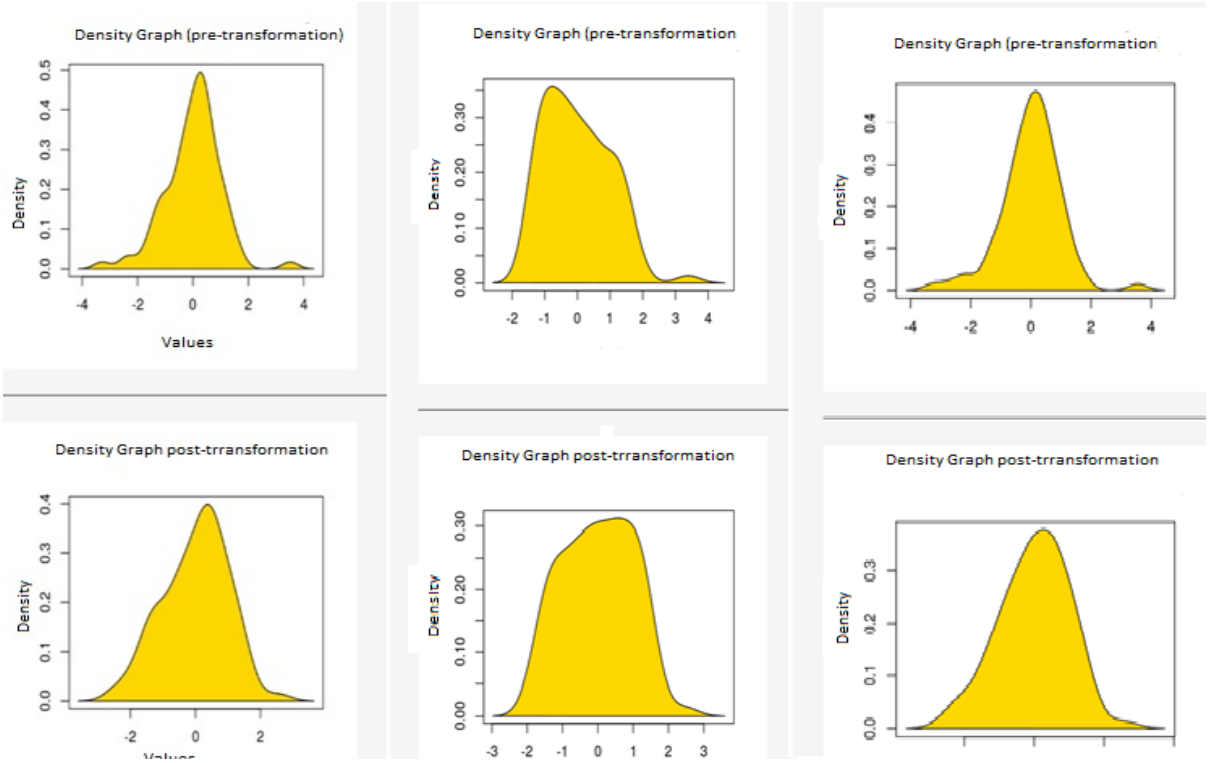
Figure 1. Normality Assumption Check



Anderson-Darling test

Variables	Stats	p value
x2010_transformed_transformed	0.448	0.273
x2011_transformed_transformed	0.484	0.223
x2012_transformed_transformed	0.749	0.049
x2013_transformed_transformed	2.714	<0.001
x2014_transformed_transformed	0.465	0.249
x2015_transformed_transformed	0.781	0.041
x2016_transformed_transformed	0.532	0.169
x2017_transformed_transformed	1.057	0.008
x2018_transformed_transformed	0.317	0.532
x2010_transformed_transformed	0.986	0.505
x2011_transformed_transformed	0.986	0.472
x2012_transformed_transformed	0.962	0.014
x2013_transformed_transformed	0.637	<0.001
x2014_transformed_transformed	0.986	0.481
x2015_transformed_transformed	0.969	0.039
x2016_transformed_transformed	0.985	0.418
x2017_transformed_transformed	0.942	0.001
x2018_transformed_transformed	0.989	0.7

Figure 2. Intensity Graphs Before and After Transformation



The problem of multicollinearity is an undesirable situation in cluster analysis. This may be due to reasons such as the strong correlation between the variables, the fact that the number of observations is less than the number of variables, or that the sample is not representative of the population. The degree of multicollinearity can also be determined by high correlation between variables, VIF (variance swelling values) >10, a small tolerance value or condition index (Alpar, 2016, p. 555).

Table 2. Variance-Covariance Matrix and Tolerance-VIF Values

MIGRATION/ GDP	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	tolerance	VIF
2010	-.975	-.975	-.975	-.975	-.975	-.976	-.976	-.976	-.975	-.975	.007	144,183
2011	-.971	-.971	-.971	-.971	-.971	-.972	-.972	-.972	-.971	-.971	.018	55,642
2012	-.701	-.701	-.701	-.701	-.701	-.701	-.702	-.702	-.701	-.702	.170	5,876
2013	-.711	-.711	-.711	-.711	-.711	-.712	-.712	-.713	-.712	-.712	.089	11,200
2014	-.913	-.912	-.913	-.912	-.912	-.913	-.914	-.914	-.913	-.913	.021	46,818
2015	-.950	-.950	-.950	-.950	-.950	-.950	-.951	-.950	-.950	-.951	.013	77,506
2016	.496	.496	.497	.497	.497	.497	.496	.495	.496	.495	.128	7,812
2017	-.882	-.882	-.882	-.882	-.882	-.882	-.882	-.882	-.882	-.882	.045	22,407
2018	.972	.972	.972	.972	.972	.972	.972	.972	.972	.972	.011	93,645
2019	-.970	-.970	-.970	-.970	-.970	-.970	-.970	-.970	-.970	-.970	.008	128,368

According to the analysis of the variance-covariance matrix, VIF and tolerance values for migration and GDP per capita values, it is seen that there are multiple connections between the variables according to years. To solve this problem, highly correlated variables were combined into a single variable and the multicollinearity problem was solved by calculating the square of Mahalanobis distances. As stated in the previous section, it is possible to combine by examining the Mahalanobis distance and variance covariance structures.

The k-means method, which is one of the non-hierarchical methods, was used in the cluster analysis. Clustering was made over the net migration values of provinces with a cluster number of (k) 4, and the groups formed are shown below (Table 3). In cluster analysis, hyperparameter measurement type is numerical, similarity or distance criterion is Mahalanobis, maximum repetition is 10 and maximum optimization is 100. Accordingly, the provinces were grouped into 4 groups according to their net migration values. Similarly, the clustering of provinces according to their GDP per capita values is given below (Table 4).

Table 3. Provinces Grouped by Net Migration Values

Group 0 (Highly sending) 25 Provinces	Adana, Adıyaman, Afyonkarahisar, Ağrı, Bitlis, Çankırı, Çorum, Diyarbakır, Erzurum, Giresun, Hatay, Kahramanmaraş, Kars, Kırıkkale, Mardin, Mersin, Muş, Şanlıurfa, Siirt, Sivas, Tokat, Trabzon, Van, Yozgat, Zonguldak
Group 1 (Sending) 47 Provinces	Aksaray, Amasya, Ardahan, Artvin, Aydın, Balıkesir, Bartın, Batman, Bayburt, Bilecik, Bingöl, Bolu, Burdur, Çanakkale, Denizli, Düzce, Edirne, Elâzığ, Erzincan, Gaziantep, Gümüşhane, Hakkâri, Iğdır, Isparta, Karabük, Karaman, Kastamonu, Kayseri, Kilis, Kırklareli, Kırşehir, Konya, Kütahya, Malatya, Manisa, Nevşehir, Niğde, Ordu, Osmaniye, Rize, Sakarya, Samsun, Sinop, Şırnak, Tunceli, Uşak, Yalova
Group 2 (Receiving) 8 Provinces	Ankara, Antalya, Bursa, Eskişehir, İzmir, Kocaeli, Muğla, Tekirdağ
Group 3 (Highly receiving) 1 Province	İstanbul

Table 4. Provinces Grouped by GDP Values

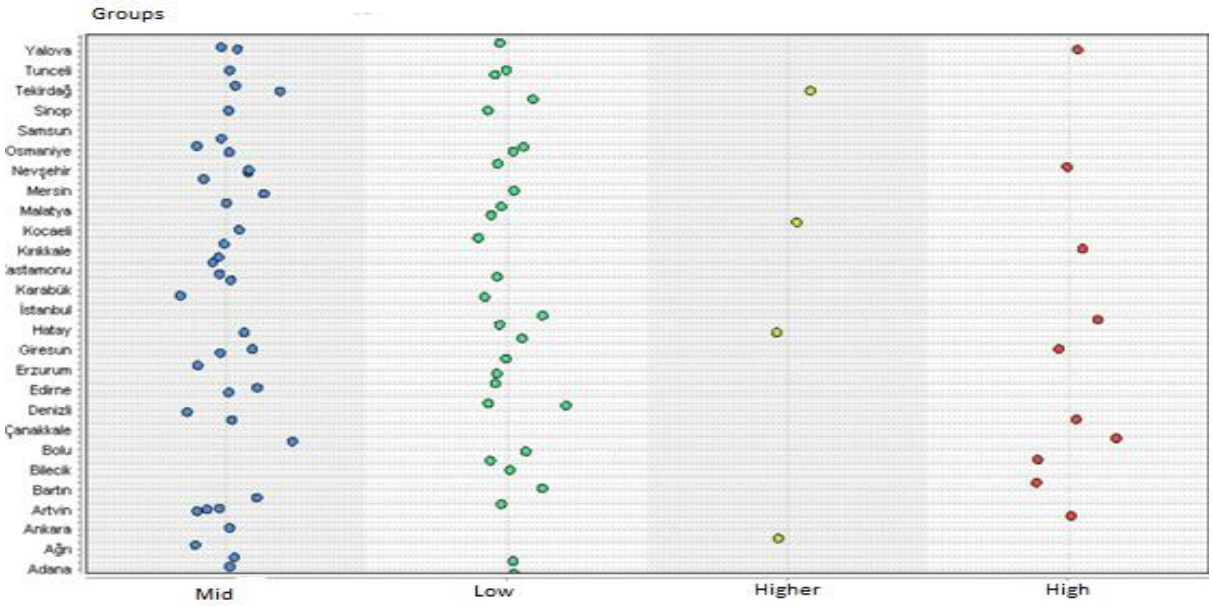
Group 0 (Low GDP) 29 Provinces	Adıyaman, Ağrı, Ardahan, Batman, Bayburt, Bingöl, Bitlis, Çorum, Diyarbakır, Elazığ, Erzurum, Giresun, Hakkâri, Hatay, Iğdır, Kahramanmaraş, Kars, Kilis, Malatya, Mardin, Muş, Ordu, Osmaniye, Şanlıurfa, Siirt, Şırnak, Tokat, Van, Yozgat
Group 1 (Mid-level GDP) 38 Provinces	Adana, Afyonkarahisar, Amasya, Aksaray, Artvin, Aydın, Balıkesir, Bartın, Burdur, Çankırı, Denizli, Düzce, Edirne, Erzincan, Gaziantep, Gümüşhane, Isparta, Karabük, Karaman, Kastamonu, Kayseri, Kırıkkale, Kırşehir, Konya, Kütahya, Manisa, Mersin, Nevşehir, Niğde, Rize, Sakarya, Samsun, Sinop, Sivas, Trabzon, Tunceli, Uşak, Zonguldak
Group 2 (High GDP) 10 Provinces	Antalya, Bilecik, Bolu, Bursa, Çanakkale, Eskişehir, İzmir, Kırklareli, Muğla, Yalova
Group 3 (Higher GDP) 4 Provinces	Ankara, Tekirdağ, İstanbul, Kocaeli

Thus, the provinces were grouped according to both their migration rates and their GDP levels, and the relationship between the provinces' GDP levels and migration data became interpretable.

5. CONCLUSION

The basic assumption of our study is that the provinces in Group 2 and Group 3 with high GDP values receive immigration, while provinces with low GDP value give immigration. As a result of the cluster analysis, provinces with high GDP are expected to stay in their own group in terms of migration values, that is, to be in the non-immigrant group; provinces with low GDP are expected to remain in the immigrant group (Figure 3).

Figure 3. Distribution of Provinces by Groups by GDP Data



According to the conclusions, 67 provinces in Group 0 and Group 1, whose GDP values were determined as low or medium, are among the groups that emigrate or too much emigrate in terms of net migration values. The rate of participation in the expected groups was measured as approximately 93% (67/72*100). It is seen that Ankara, Antalya, Bursa, Eskişehir, İstanbul, İzmir, Kocaeli, Muğla and Tekirdağ, which have high GDP values in Group 2 and Group 3, are among the provinces receiving immigration. However, the provinces of Bilecik, Bolu, Çanakkale, Kırklareli and Yalova, which are the provinces that emigrate despite their high GDP values, are included in Group 1 and Group 2. The common features of these provinces are their low population and geographical proximity to industrialized cities. While these provinces emigrate to the metropolises right next to them, they can transfer income from them. The rate of participation in the expected groups was measured as approximately 65% (9/14*100).

As the result of the cluster analysis, the overall agreement rate is 79%. To put it more clearly, the basic assumption of our study, that the provinces with high GDP levels receive immigration, while the provinces with low GDP emigrate, is valid at a rate of 79%. Among the provinces receiving immigration, there is no province with a low GDP value. Most of the provinces with high GDP are also provinces that receive immigration.

Granger Causality analysis has been performed after cluster analysis. The results of the analysis are shown in the table below. In nine provinces (Ankara, Antalya, Kocaeli, Tekirdağ, İzmir, Bursa, Muğla, Eskişehir and İstanbul), there is a positive and significant causality from GDP to migration. Furthermore, for 28 provinces, there is a negative substantial correlation between GDP and migration.

Table 5. Results of Granger Causality Analysis

		Estimated		**Bootstrap critical values**		
Group	**City**	**coefficient**	**Test Data**	**1%**	**5%**	**10%**
Highly sending	Adana	-0,42	3,56	302,63	241,23	152,98
Highly sending	Adıyaman	-0,54	16.42**	145,98	103,58	58,17
Highly sending	Afyonkarahisar	-0,32	2,58	98,12	69,47	12,47
Highly sending	Ağrı	-0,12	25.35*	369,41	187,36	90,58
Highly sending	Bitlis	-0,11	6,19	154,36	101,53	45,34
Highly sending	Çankırı	-0,21	1,73	293,63	200,39	103,23
Highly sending	Çorum	-0,11	16,17	175,61	94,59	50,04

		Estimated		Bootstrap critical values		
Group	**City**	**coefficient**	**Test Data**	**1%**	**5%**	**10%**
Highly sending	Diyarbakır	-0,36	14.16**	101,64	80,39	21,72
Highly sending	Erzurum	-0,26	22,68	69,75	36,36	12,11
Highly sending	Giresun	-0,15	9.43**	36,72	10,05	5,67
Highly sending	Hatay	-0,25	5,14	13,63	5,39	1,71
Highly sending	Kahramanmaraş	-0,24	7.77***	17,83	10,55	3,24
Highly sending	Kars	-0,14	21.14*	106,55	79,33	34,41
Highly sending	Kırıkkale	-0,21	0,99	52,76	28,61	13,76
Highly sending	Mardin	-0,36	30.53*	432,97	263,81	105,83
Highly sending	Mersin	-0,37	12.58**	104,53	55,79	38,25
Highly sending	Muş	-0,14	6,56	66,22	41,29	17,62
Highly sending	Siirt	-0,35	18.36**	241,85	147,36	95,38
Highly sending	Sivas	-0,14	0,82	105,36	65,87	36,92
Highly sending	Şanlıurfa	-0,32	56.98*	336,87	257,41	122,69
Highly sending	Tokat	-0,19	8.77***	53,69	28,74	12,05
Highly sending	Trabzon	-0,04	0,76	4,59	1,23	0,69
Highly sending	Van	-0,28	29.78*	187,86	87,65	38,23
Highly sending	Yozgat	-0,18	5,66	97,41	58,93	14,38
Highly sending	Zonguldak	-0,39	2,59	14,66	7,31	2,73
Receiving	Ankara	2,36	88.96*	225,63	185,37	100,14
Receiving	Antalya	2,17	44.63*	136,58	65,31	44,93
Receiving	Kocaeli	1,45	23.97*	77,83	43,12	34,72
Receiving	Tekirdağ	1,36	38.43*	326,92	234,11	105,36
Receiving	İzmir	1,28	19.83*	198,77	132,48	58,96
Receiving	Bursa	1,21	15.76**	98,83	46,66	21,88
Receiving	Muğla	1,18	22.55**	177,63	89,76	24,63
Receiving	Eskişehir	1,04	13.54**	68,42	43,23	28,96
Highly Receiving	İstanbul	4,56	106.58*	322,74	258,41	123,58
Sending	Samsun	-0,02	1,36	25,47	12,34	7,88
Sending	Sinop	-0,06	5.98***	19,36	9,48	2,74
Sending	Şırnak	-0,02	17.8**	26,87	15,41	9,63
Sending	Tunceli	-0,08	3,66	5,89	2,96	0,87
Sending	Uşak	-0,04	9.61****	16,74	8,21	3,79
Sending	Yalova	-0,01	3,26	9,77	2,24	0,83
Sending	Sakarya	-0,04	6.63***	76,34	35,45	14,72
Sending	Aksaray	-0,05	2,67	66,14	45,21	33,99
Sending	Amasya	-0,03	6.54***	79,25	36,4	9,43
Sending	Ardahan	-0,07	3,33	6,54	1,55	0,23
Sending	Artvin	-0,04	8.91***	66,22	24,14	7,93
Sending	Aydın	-0,08	4.74***	101,65	52,33	24,79
Sending	Balıkesir	-0,04	2,38	21,92	11,84	5,66
Sending	Bartın	-0,02	5.87***	28,77	13,57	5,97
Sending	Batman	-0,01	16.99*	130,58	68,96	22,77

		Estimated		Bootstrap critical values		
Group	**City**	**coefficient**	**Test Data**	**1%**	**5%**	**10%**
Sending	Bayburt	-0,09	14.63*	39,78	34,77	19,21
Sending	Bilecik	-0,01	7,99	101,86	74,36	14,94
Sending	Bingöl	-0,06	17,85	106,82	53,44	26,37
Sending	Bolu	-0,06	3,66	84,56	53,41	11,28
Sending	Burdur	-0,01	1,89	86,23	63,41	12,47
Sending	Çanakkale	-0,07	9,66	93,92	36,42	9,87
Sending	Denizli	-0,01	1,02	3,97	0,87	0,17
Sending	Düzce	-0,05	6,47	56,39	21,94	11,83
Sending	Edirne	-0,02	0,743	66,47	43,87	21,51
Sending	Elazığ	-0,01	1,39	14,83	6,84	0,49
Sending	Erzincan	-0,07	12.96**	179,36	62,46	13,47
Sending	Gaziantep	-0,03	11,83	74,33	28,92	17,63
Sending	Gümüşhane	-0,04	3.99***	28,36	13,77	3,54
Sending	Hakkari	-0,07	6.74***	362,41	156,92	43,87
Sending	Iğdır	-0,03	24.33**	53,74	23,14	4,99
Sending	Isparta	-0,01	1,14	8,36	4,24	0,73
Sending	Karabük	-0,06	13,54	103,55	63,47	21,94
Sending	Karaman	-0,04	2,36	11,55	2,39	0,46
Sending	Kastamonu	-0,03	23.98*	360,14	198,74	55,61
Sending	Kayseri	-0,01	6,47	169,47	67,43	19,46
Sending	Kırklareli	-0,04	0,87	57,24	16,63	10,27
Sending	Kırşehir	-0,03	6,54	55,11	28,97	12,36
Sending	Kilis	-0,05	1,47	79,83	11,77	0,82
Sending	Konya	-0,01	6,78	41,62	33,78	11,63
Sending	Kütahya	-0,09	13.64**	265,56	99,73	24,93
Sending	Malatya	-0,06	5,87	116,87	29,88	7,43
Sending	Manisa	-0,03	21,36	303,56	178,63	99,85
Sending	Nevşehir	-0,05	3,87	99,73	34,19	8,49
Sending	Niğde	-0,01	3,11	50,83	6,34	0,77
Sending	Ordu	-0,01	26,35	139,47	54,89	9,99
Sending	Osmaniye	-0,03	17,39	103,58	69,88	23,47
Sending	Rize	-0,01	1,39	69,87	53,14	29,43

Note: Ho : migration does not cause GDP. Column “Estimated coefficient” denotes the coefficient of the lagof the immigration rate in the equation testing for Granger causality from immigration rate to GDP.

Column “Test Stat.” represents the Wald test statistic for Granger causality from immigration rate to LOG(GDP). ***, **, and * indicate rejection of the null hypothesis at the 1, 5, and 10 percent levels of significance, respectively.

These conclusions show us that provinces with high income generation or accretion value potential also have high migration-receiving rates. Conversely, it can be said that provinces with high migration-receiving rates have the opportunity to create higher income or generate accretion value. In this case, the question arises whether these provinces receive immigration due to the high income generation potential, or they can generate high income because they can receive immigration.

In our opinion, this structure is the result of processes that feed each other. In other words, these provinces, with some of their qualities and opportunities, both receive immigration because they are centers of attraction to which

immigration is directed, and can create high accretion value because they have the potential to receive immigration. This study reveals the strong effect of economic factors, which are among the most important causes of migration, on migration data.

When the results of a study grouping 81 provinces in Turkey over 54 socio-economic indicators using hierarchical clustering analysis are compared with the results of this study, it is seen that similar results have been reached. It has been determined that the provinces in Eastern and Southeastern Anatolia are the least developed regions, while the provinces in the Marmara, Aegean and Mediterranean Regions are among the developed regions. The provinces included in the developed provinces category in this study and the provinces receiving immigration in our study overlap significantly. Similarly, the provinces shown as the least developed regions in the study and the provinces receiving immigration in our study overlap significantly (Karabulut et al., 2004 p. 76).

According to the results of another study examining the relationship between rural-urban migration and socio-economic indicators, a moderately significant relationship was found between rural characteristics and migration data. These results have been interpreted as the attractive features of the urban are the main determinants in the phenomenon of migration (Gürbüz & Karabulut, 2008, p. 58). The attractive features of urban largely shape the migration phenomenon. The superiority of urban over the rural as a level of socio-economic development is also a determining factor for migration.

Apart from these, there are many studies that directly or indirectly examine the relationship between socio-economic indicators and migration data. All these studies prove that the direction of migration is from underdeveloped places to developed ones. The GDP data of the provinces is one of the most important indicators that reflect the socio-economic development level.

DECLARATION OF THE AUTHORS

Declaration of Contribution Rate: The first author is responsible for the literature review and data collection while the second author is responsible for the determination of the method, analysis and the reporting of the findings. The first author contributes 75% while the second author contributes 25%.

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