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Spatial Analysis of the Relationship Between Internal Migration, Education, and Growth in Turkey

Türkiye'de İç Göç, Eğitim ve Büyüme İlişkisinin Mekansâl Analizi

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Reyhan CAFRI AÇCI

Doç. Dr., İSTE, İşletme ve Yönetim Bilimleri Fakültesi

Assoc. Prof., ISTE, Faculty of Business and Management Sciences

reyhan.cafri@iste.edu.tr / Orcid ID: 0000-0002- 6271-5330

Yunus AÇCI

Doç. Dr., İSTE, İşletme ve Yönetim Bilimleri Fakültesi

Assoc. Prof., ISTE, Faculty of Business and Management Sciences

yunus.acci@iste.edu.tr / Orcid ID: 0000-0002-3385-9087

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Spatial Analysis of the Relationship Between Internal Migration, Education, and Growth in Turkey *

Abstract

People have to migrate to find better jobs, survive for various reasons such as war, famine, and environmental factors, in other words, to have better living conditions. The impact of internal migration, which is considered to be an economic efficiency factor, on growth has been the subject of a limited number of studies. There are conflicting results in these studies regarding the effects of internal migration on growth. In addition, the studies ignore that growth and internal migration is a spatial phenomenon. In this context, the effect of internal migration on growth in Turkey for 2017 is investigated by spatial regression analysis based on 81 provinces. In addition to internal migration, the education variable was also taken into account in the analyzes. However, since it is important whether immigrants are skill-biased or not, the interaction variable is also used to represent the skill-biased labor force in the study. The interaction variable was obtained by multiplying internal migration and educational variables. As a result, spatial dependence exists and is important, both drawing visual attention from maps and the situation in question is supported by the Moran I Index and LM tests. The spatial lag model was found to be appropriate. According to the appropriate model determined, the impact of internal migration and education on growth was statistically significant and positive. It can be concluded that as the internal migration and education level increase, the growth of the provinces also increases. The interaction variable obtained by multiplying internal migration and education was also found to be statistically significant and positive. However, it seems that the interaction variable is greater in absolute magnitude than the education alone or internal migration alone variable. This shows that internal migration significantly increases growth when skills are biased.

Keywords: Internal Migration, Growth, Education, Spatial Analysis, Skill-Biased Labor Force.

Türkiye'de İç Göç, Eğitim ve Büyüme İlişkisinin Mekansâl Analizi

Öz

İnsanlar iş bulmak, savaş, kıtlık ve çevresel faktörler gibi çeşitli nedenlerle hayatta kalmak, bir başka ifade ile daha iyi yaşam koşullarına sahip olmak için göç etmek durumunda kalmaktadırlar. Bir ekonomik verimlilik faktörü olarak düşünülen iç göçün büyüme üzerindeki etkisi sınırlı sayıda çalışmaya konu olmuştur. Bu çalışmalarda iç göçün büyüme üzerindeki etkilerine dair çelişkili sonuçlar bulunmaktadır. Ayrıca, çalışmalarda da büyümenin ve iç göçün mekânsal bir olgu olduğu göz ardı edilmektedir. Bu bağlamda çalışmada 2017 yılı için Türkiye'de iç göçün büyüme

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üzerindeki etkisi 81 il baz alınarak mekânsal regresyon analizi ile araştırılmaktadır. Analizlerde iç göçün yanı sıra eğitim değişkeni de dikkate alınmıştır. Bununla birlikte, göç edenlerin beceri yanlı olup olmadıkları önem arz ettiğinden çalışmada beceri yanlı işgücünü temsil etmek üzere etkileşim değişkeni de kullanılmaktadır. Etkileşim değişkeni iç göçün ve eğitim değişkenlerinin çarpımından elde edilmiştir. Sonuç olarak, mekânsal bağımlılığın var olduğu ve önem teşkil ettiği hem haritalardan görsel olarak dikkat çekmekte hem de söz konusu durum Moran I endeksi ve LM testleri ile desteklenmektedir. Mekânsal gecikme modelinin uygun olduğu bulunmuştur Belirlenen uygun modele göre iç göçün ve eğitimin büyüme üzerindeki etkisi istatistiki açıdan anlamlı ve pozitif olarak elde edilmiştir. İç göç ve eğitim seviyesi arttıkça illerin büyümelerinin de arttığı bulgusu sonucuna varılabilmektedir. İç göç ve eğitimin çarpımı ile elde edilen etkileşim değişkeni ise yine istatistiki açıdan anlamlı ve pozitif olarak bulunmuştur. Ancak, etkileşim değişkeninin mutlak büyüklük olarak tek başına eğitim veya tek başına iç göç değişkeninden daha büyük olduğu görülmektedir. Bu durum, iç göçün beceri yanlı olduğunda büyümeyi dikkate değer bir şekilde arttırdığını gözler önüne sermektedir.

Anahtar Kelimeler: İç Göç, Büyüme, Eğitim, Mekânsal Analiz, Beceri Yanlı İşgücü

Introduction

People often have to migrate due to war, famine, and environmental factors in order to survive and have a better standard of living. Migration can be handled for different purposes such as short-long-term, voluntary-compulsory, internal- international migration. However, internal migration and international migration classification are more prominent. International migration, also referred to as external migration, is defined as settling in another country temporarily and permanently (Şantaş, 2019). The connection of international migration with economic growth has been a widely discussed topic in both national (Demirtaş et al., 2021; İşcan and Demirel, 2021; Meçik and Koyuncu, 2020; Engin and Konuk, 2020; Altunç et al., 2017; Kaypak and Bimay, 2016) and international (Tanrikulu, 2020; Murata, 2018; Brunow et al., 2015; Chen and Fang, 2013; Chen, 2006) literature. Internal migration, on the other hand, is defined as migration that occurs within the borders of the country. While internal migration creates population density differences between provinces, it also leads to economic and social differentiation as there is to international migration. Although internal migration is widely considered a factor of economic efficiency in developed countries, this may be different in developing or underdeveloped countries. Internal migration provides an increase in per capita income. Along with this, it leads to a decrease in the agricultural labor force and an increase in the labor force in the industrial and service sectors. Given that industrial and service sectors tend to concentrate in urban centers, and that urban birth rates are lower than rural birth rates, migration flows are considered to have a significant impact on various problems of the development process, such as population and employment (Falaris, 1979). Generally, the determinants of internal migration have been investigated in studies. In other words, the effect of internal migration on economic growth has been investigated (Başel, 2007; Çatalbaş and Yarar,2015; Dücan, 2016; Albayrak and Abdioğlu, 2017, Çetin and Çetin, 2018; Ondes and Kizilgol, 2020). There are very few studies dealing

with the effects of internal migration on growth for Turkey. In their study, Bayraktar and Özyılmaz (2019) revealed the effects of internal migration on economic growth in Nuts-2 regions between 2008 and 2017 with panel models. In another study, it was investigated whether there were differences in various factors such as housing, income, wealth, health, and education in two province groups, whose net migration level was positive and negative for the period of 2011-2015. It has been determined that the averages of these factors are higher in the provinces receiving immigration (Kandemir, 2017). Topbaş and Tanrıöver (2009) investigated the effects of internal migration on growth and per capita income in their study in which they tested the Lowry hypothesis. There is a common result in all of these studies that the effect of internal migration on growth is positive.

In the literature, the socio-economic effects of population movements on the migrated place differ depending on whether the migrants are skill-biased and the capacity to absorb the migration place. In Turkey, one of the developing countries, the effects of internal migration on growth and the interaction of this effect with the level of education of the migrating population are intriguing.

The concept of growth and migration emerges as a spatial phenomenon by structure. When internal migrations are examined in Turkey, it is generally observed that population movements occur from the eastern and inland to coastal areas or, in other words, towards places whose industry is in better condition. The distribution of growth or GDP data in the provinces also bears a resemblance to this structure. In this case, it is of great importance to consider the spatial structure in the analysis. Ignoring the spatial effect leads to bias of parameters, revealing variable problems that have been omitted in econometrics. In this context, it is thought that using spatial regression models that use spatial effects as information will yield more effective results.

In the studies conducted in the literature, the issue of external migration and growth is generally discussed. Internal migration has a greater impact than external migration in terms of reducing poverty and contributing to economic growth in developing countries. Among the reasons for this effect are that internal migration is likely to increase more than external migration, and that internal migration is a driver of economic growth in many sectors, such as construction and manufacturing (Deshingkar, 2016). In a limited number of studies that exist for Turkey regarding internal migration and growth, the existence of spatial effect is ignored. In this context, the study aims to examine the effect of inter-provincial migration on growth in Turkey through spatial models and to achieve more effective results. In addition, the study reveals the effect of migration and education interaction on growth by using the education variable to reflect the skill-oriented workforce.

While the studies in the literature are included in the next section of the study, the data and method are introduced in the third section. While the analysis results are discussed in the fourth section, the fifth section, which is the last section, includes evaluations and results.

Literature

When the literature on studies examining the relationship between internal migration, education, and economic growth is examined, it is seen that there are different results due to the differences in the countries considered and the methods used.

Akbari and Haider (2018) analyzed the potential effects of immigrants ' education levels on Canada's economic growth. As a result of the 2006-2013 period and the study using the FGLS method, it is revealed that the education levels of all immigrants have positive and statistically significant effects on economic growth.

Akhtar and Jariko (2018), tested the socio-economic determinants of poverty in Pakistan and seasonal migration with logistic regression analysis. They concluded that there is a negative relationship between the rate of not going to school which they consider as an education indicator and immigration. This indicates that the decrease in the level of education reduces migration.

Bove and Elia (2017) examined the impact of cultural diversity created by internal migration on growth. In the study, it is thought that internal migration will feed technological innovation and have a positive effect on economic growth. However, it has been taken into consideration that increasing heterogeneity may weaken social cohesion and have a negative impact on economic development. As a result of the analysis, it was concluded that internal migration has a positive impact on economic growth, especially in developing countries.

Bayraktar and Özyılmaz (2017) tested the impact of internal migration on regional inequality in their study. As a result of the analysis, it was concluded that regional inequality decreased in the provinces receiving migration and that inequality increased in the emigrant provinces. In order to reduce regional inequality in migrating provinces, they proposed policies such as reducing public investment and increasing investments in human capital.

Eshetu and Beshir (2017) in their study investigating the determinants of internal migration in Ethiopia; concluded that age, education, and income levels significantly affect internal migration. In addition, in the study, it was emphasized that agricultural and non-agricultural activities should be increased in migrating regions in order to reduce the growth differences between regions.

Dücan (2016) analyzed the socio-economic causes of internal migration in Turkey by panel regression method. As a result of the analysis, it was concluded that the increase in the education level increased internal migration. As a result of the study, it is emphasized that economic differences between the provinces that receive migration and emigrate make sense of the increased internal migration as a result of the increase in the level of education.

Chandrasekhar and Sharma (2014) discussed the relationship between internal migration, education, and employment for India. The study in question reveals that internal migration for educational purposes in states in India causes brain drain and therefore increases growth differences between states. In this context, they presented a policy proposal that should be made immediately, that higher education spending should be increased in all states.

Boubtane et al. (2014) analyzed the impact of migration on economic growth in 22 OECD countries using the data for the period between 1986 and 2006 and the dynamic panel data analysis method. It has been concluded that in all countries, including countries with selective migration policies, the human capital provided by migration has a positive but minor effect on economic growth.

Keshri and Bhagat (2013) have considered the socioeconomic determinants of internal migration in India within the framework of temporary and permanent migration. As a result of the study, it was revealed that migration due to low economic, educational and social status is temporary migration, as well as internal migration is a survival strategy for the rural poor in India.

Kırdar and Saracoğlu (2012), who examined the effect of internal migration on Inter-Provincial per capita income convergence in Turkey using the OLS method, concluded that internal migration does not have an effect on accelerating convergence. Among the reasons for this result is the existence of an endogenity problem between internal migration and growth, and a decrease in the marginal return on capital.

In their study, Roy and Depnath (2011) analyzed the factors affecting migration and the effects of migration on economic development by the OLS method for the Indian economy. As a result of the analysis, it was concluded that income per capita positively affected net migration, while unemployment rate and living costs negatively affected net migration. However, net migration has been shown to contribute positively to economic development.

Bülbül and Köse (2010) examined interregional migration movements in Turkey in order of demographic indicators and socio-economic development with Multidimensional Scaling Analysis. It has been concluded that migration movements cause inadequacy in education and health services in cities that receive internal migration besides cause negativities in emigrating cities due to the departure of young labor and capital from the region.

Topbaş and Tanrıöver (2009) analyzed the relationship between internal migration flows, economic growth rates and gross domestic product per capita in their study, in which they tested the validity of the Lowry hypothesis for Turkey. As a result of the study, it was concluded that internal migration was positively associated with growth and per capita gross domestic product, while it was emphasized that the economic growth factor did not have a dominant effect on internal migration flows as much as the income factor.

In his study, which focuses on the impact of interregional migration flows on economic growth in Italy, Etzo (2008) concluded that immigrants, especially those with higher education levels, have a strong impact on regional growth.

Pazarlıoğlu (2007) tested the factors affecting internal migration in İzmir with the help of a probit model. As a result of the analysis, it was concluded that the internal migration to Izmir was economic and that the migration to Izmir was insufficient in terms of qualified labor. The study also made a policy proposal that human capital should be developed.

Yap (1976) concluded that internal migration in Brazil in the post-war period had a strong and positive impact on Brazil's economic growth in his study, which he handled with the help of data from the period between 1950 and 1965.

Data and Methodology

In order to investigate the impact of internal migration and education on growth, the spatial analysis method is carried out using data from 81 provinces in Turkey for 2017. The variables used in the analysis and the information about these variables are included in Table 1.

Table 1. Data specification and source

Variable	Definition	Year	Source
Migration	Net internal migration rate (per thousand)	2017	TUIK[1]
Growth	GDP per capita ($)	2017	TUIK
Education	Secondary schooling rate (%)	2017	TUIK
Interaction	Migration*Education	2017	TUIK

Looking at the GDP and migration values respectively in Figure 1 and Figure 2 for Turkey, it can be observed that there is clearly a spatial effect. Ignoring this effect in the case where the spatial effect exists causes to be the omitted variable problem in econometrics, causing the parameters to biased. Therefore, in the case of spatial effect, it is necessary to include this effect in the model. But maps provide a priori knowledge about the existence of the spatial effect. In this context, the Moran I index is used to determining whether a spatial correlation exists. However, with the help of Moran I statistics, it is not possible to determine whether the spatial lag model or the spatial error model is valid. Therefore, LM statistics are used. The values of "LM_ρ" for the spatial lag model and "LM_λ" for the spatial error model are calculated with LM statistics. According to the hypotheses, if ρ=0 the spatial error model and if λ=0 the spatial lag model is suitable. If both hypotheses are rejected, it is decided that the model with a higher level of significance is appropriate. If the significance levels are the same, robust values are taken into account. The spatial lag model is estimated as follows:

$$y_i = \rho \sum_{j=1}^{n} W_{ij} y_j + \varepsilon_i \quad (1)$$

In equation 1, the fact that the delay of the dependent variable is included in the model as an independent variable causes the endogeneity problem. In this context, estimates are made using GMM (Generalized Moments Method) technique to overcome the endogeneity problem.

$$y = X\beta + u \quad (2)$$

$$u = \lambda W u + \varepsilon \quad (3)$$

W, in equations 1 and 3, expresses the neighborhood matrix. If the two provinces are neighbors to each other, the value is 1, if not 0 in this matrix (Lesage and Pace, 2009).

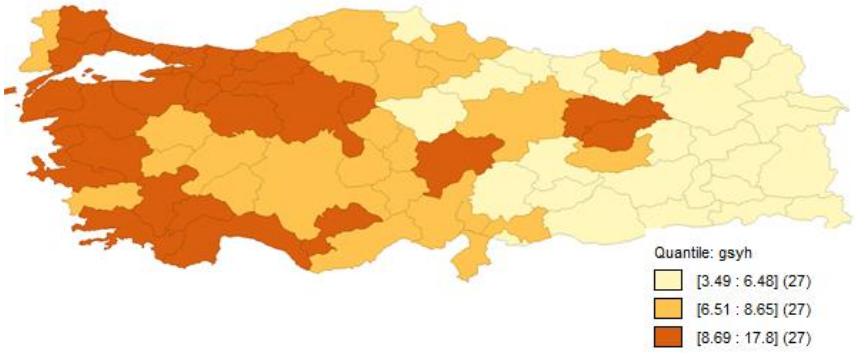
Empirical Findings

In the first stage, when we look at the distribution of per capita GDP variable used to represent growth, which is the dependent variable in Figure 1, it is observed that GDP

[1] Turkish Statistical Institute

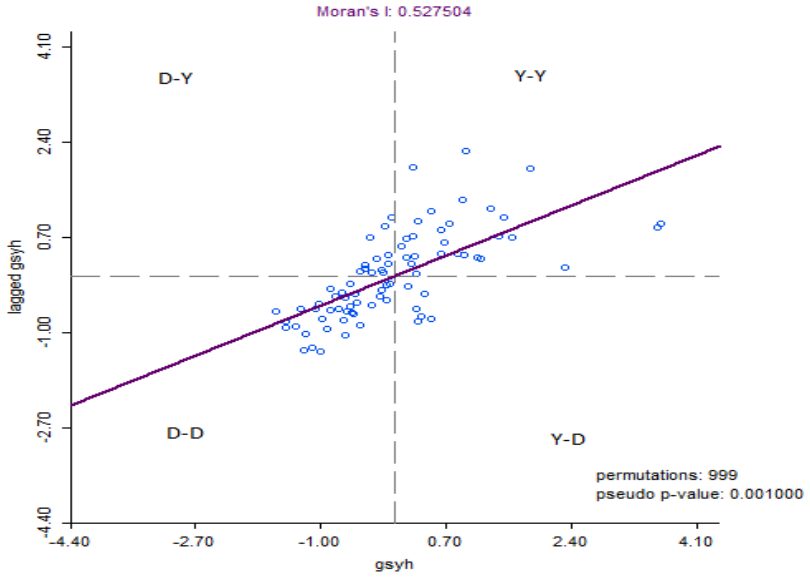
per capita is generally high in western provinces of Turkey and low in eastern provinces. The provinces with the lowest GDP per capita between $3.489 and $6.477 shown in the lightest color on the map are respectively Ağrı, Van, Şanlıurfa, Bitlis, Muş, Siirt, Batman, Hakkari, Diyarbakır, Adıyaman, Şırnak, Bingöl, Mardin, Tokat, Kars, Gümüşhane, Bayburt, Ordu, Kilis, Giresun, Igdır, Malatya, Yozgat, Kahramanmaraş, Erzurum, Ardahan, Sinop.

Figure 1. Spatial Distribution of GDP Per Capita for 2017



Provinces with a moderately high level GDP per capita, $6.513 - $ 8.648, are Osmaniye, Bartin, Elazig, Chorum, Niğde, Afyonkarahisar, Hatay, Nevsehir, Aksaray, Sivas, Chankiri, Samsun, Kırşehir, Zonguldak, Amasya, Gaziantep, Aydın, Kastamonu, Adana, Kütahya, Isparta, Konya, Karabük, Trabzon, Mersin, Uşak and Edirne. Countries with a high level of per capita GDP, $8,687 - $17,827, are Burdur, Kırıkkale, Erzincan, Balıkesir, Rize, Artvin, Kayseri, Tunceli, Düzce, Karaman, Manisa, Denizli, Sakarya, Muğla, Çanakkale, Antalya, Kırklareli, Bolu, Eskişehir, Yalova, Bilecik, Bursa, Izmir, Tekirdağ, Ankara, Kocaeli and Istanbul.

Graph 1. The Moran I Index of Per Capita GDP (2017)



In Graph 1, the existence of spatial autocorrelation for GDP per capita, which is the dependent variable, is determined by the Moran I index. Accordingly, there is a positive statistically significant relationship between the GDP per capita values of the provinces and the GDP per capita values of the neighboring provinces by approximately 52%. Y-Y is the region where the province and its neighbors have a high per capita GDP. In this region, there are mostly provinces in the western Aegean, Marmara, Central Anatolia, and Mediterranean regions. D-D is the Black Sea, Eastern Anatolia, and Southeastern Anatolia regions where the province and its neighbors have low per capita GDP. D-Y region shows provinces such as Afyonkarahisar, Zonguldak, Aksaray, Bartin, Aydın, where the region with a low GDP per capita is surrounded by a high Region. For the Y-D region, Kırıkkale, Ankara, Artvin provinces, where the region with high GDP per capita is surrounded by low regions, can be shown as an example.

Figure 2. Spatial Distribution of Net Migration for 2017

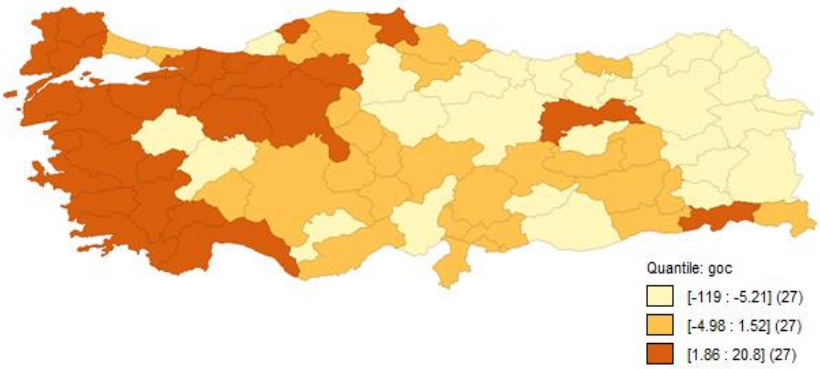


Figure 2 shows that net migration is high in the western provinces and low in the eastern provinces, similar to GDP per capita when the distribution of net migration values is taken into account. The net migration rate is between -118.9 and -5.21 per thousand, the most emigrating provinces are Bayburt, Gümüşhane, Ağrı, Muş, Giresun, Ardahan, Kars, Bitlis, Ordu, Van, Artvin, Erzurum, Yozgat, Sivas, Iğdır, Siirt, Tunceli, Adıyaman, Karaman, Çorum, Tokat, Şanlıurfa, Adana, Afyonkarahisar, Kütahya, Rize, Zonguldak respectively. Provinces with moderately high net migration rate between -4.98 and 1.52 per thousand are Diyarbakır, Niğde, Hatay, Batman, Nevşehir, Kastamonu, Mardin, Kahramanmaraş, Elazığ, Kırıkkale, Kırşehir, Konya, Gaziantep, Hakkari, Isparta, Amasya, Malatya, Mersin, İstanbul, Osmaniye, Bingöl, Trabzon, Aksaray, Samsun, Kilis, Karabük, Kayseri. The provinces with the highest net migration rate between 1.86 and 20.84 per thousand are respectively Çankırı, Manisa, Balıkesir, Bartın, Denizli, Burdur, Bolu, Erzincan, Sinop, Aydın, İzmir, Kırklareli, Ankara, Antalya, Bursa, Sakarya, Edirne, Şırnak, Uşak, Düzce, Muğla, Çanakkale, Bilecik, Eskişehir, Kocaeli, Yalova, Tekirdağ.

Table 2. Detecting Spatial Dependency for Relation of Internal Migration, Education and Growth

Variable	Model 1	Model 2
Constant	-76.619*** (0.000)	8.216*** (0.000)
Migration	0.035** (0.011)	
Education	0.884***	

	(0.000)	
Interaction		0.594*** (0.000)
Descriptive statistics for spatial dependency detection		
Moran's I	0.122*** (0.003)	7.981*** (0.000)
R^2	0.563	0.324
LM_ρ (lag)	6.462** (0.011)	35.604*** (0.000)
Rob.LM_ρ^*	1.996 (0.158)	20.484*** (0.000)
LM_λ (error)	4.948** (0.026)	16.302*** (0.000)
Rob.LM_λ^*	0.483 (0.487)	0.182 (0.277)
LM(SARMA)	6.944** (0.031)	36.786*** (0.000)
Likelihood ratio	-162.739	-180.427

Notes: *,**,*** refer to a significance level of 10, 5, and 1%, respectively. The probability values are reported in parentheses.

In order for the spatial models to be valid instead of the classical least squares method, the Moran I and LM (SARMA) tests should be statistically significant. As a result of the tests, it is seen that both tests were obtained statistically significant in all models. When the Lagrange Multiplier (LM) tests are examined to determine the appropriate model, it is seen that both the spatial lag model and the spatial error model are statistically significant. Looking at robust tests, it seems that the spatial lag model is significant in both models, and the spatial error model is statistically insignificant (Table 2).

Table 3. Spatial lag model estimation for internal migration, education and growth relationship

Variable	**Model 1**	**Model 2**
W_ gdp	0.514*** (0.000)	0.570*** (0.000)
Migration	0.031** (0.024)	
Education	0.080*** (0.000)	
Interaction		0.335*** (0.000)
Constant	-61.075*** (0.000)	3.543*** (0.001)
Spatial R^2	0.489	0.484

Notes: *,**,*** refer to a significance level of 10, 5, and 1%, respectively. The probability values are reported in parentheses.

Based on the results of the analysis in Table 2, the spatial lag model is estimated. The W_gdp variable, which is the first variable in the models, represents the spatial lagged dependent variable, that is, the GDP per capita variable, and it means that the GDP per capita in a province is related to the values in neighboring provinces. In both models, the w_gdp variable is statistically significant and positive. Thus, the appropriateness of lagged spatial dependency and the necessity to include spatial effects in the model are once again seen. In order to obtain the W weight matrix, the queen neighborhood matrix

is used in the analyses. Since the lag of the dependent variable is used as the independent variable in the spatial lag model, an endogeneity problem occurs. In order to overcome the endogeneity problem, the analysis is carried out with GMM (generalized moments method). In Model 1, migration and education variables are included in the analysis separately. In the second model, the interaction variable was obtained by multiplying the migration and training variable to represent the skill-biased weight of migration, and the interaction variable was used in this model. In Model 1, it is seen that the migration variable is statistically significant and positive. It is found that the education variable is also statistically significant and positive. In the second model, the interaction variable was also obtained significantly and positively. However, considering the interaction of migration and education, it is noteworthy that this effect is much greater in absolute terms than migration alone or education alone (Table 3).

Conclusion

In this study, inter-provincial migration movements, education, and growth relations in Turkey were analyzed spatially. There is no consensus in the economic literature on the impact of internal migration on growth. However, there are opinions that internal migration contributes positively to economic growth in a very small number of studies usually conducted for Turkey. On the other hand, it dec also considered in the international literature that it will lead to economic and social differentiation between regions and may cause negative effects. In this study, where the impact of internal migration and education on growth in Turkey was tested spatially for 2017, the presence of spatial impact is visually seen on the maps. In addition, the existence of spatial effect is tested with the Moran I index. However, the Moran I index cannot determine whether spatial dependence is due to spatial lag or spatial error so LM tests are used. As a result of the LM test, it is concluded that the spatial lag model is valid. The spatial lag model means that the GDP per capita in a province, which is the dependent variable, is related to the per capita GDP values in neighboring provinces. In the models, it is found that the impact of internal migration and education on growth is statistically significant and positive. The positive effect of internal migration on growth is consistent with the results of the limited number of studies available for Turkey (Topbaş and Tanrıöver, 2009; Kandemir, 2017; Bayraktar and Özyılmaz, 2019). The result that education affects growth positively supports the findings of the study conducted by Çalışkan (2013) for Turkey. In the said study, it was concluded that "the transfer of more resources to higher education will lead to positive effects on economic performance by increasing the possibilities of universities to produce, share and transfer knowledge to the production process". In addition, it is known in the literature that population aging, which has negative effects on the labor market has negative effects on economic growth. Migration, which has an important share in alleviating these negative effects, is considered an important component of the regional economic growth strategy in many countries (Akbari ve Haider, 2018). It is believed that educated immigrants, in particular, will contribute more to production and therefore to growth. In addition, as a result of the analysis, it is seen that the interaction variable obtained by multiplying the variables of migration and education is also significant and positive. But the interaction variable appears to be far stronger in absolute terms than internal migration alone or education alone. With this finding, it is concluded that if internal migration is skill-biased, its positive effect on growth is stronger. In this case, it can be said that it is important to increase spending on

educational activities in all provinces in order to spread the positive impact of internal migration on economic growth to all provinces and to reduce regional growth differences.

Reference

Akbari, A. H., & Haider, A. (2018). Impact of immigration on economic growth in Canada and in its smaller provinces. *Journal of International Migration and Integration*, 19(1): 129-142.

Akhtar, S., & Jariko, G. A. (2018). Socio-Economic Characteristics of Poverty and Their Impact on Seasonal Migration in Tharparkar District, Sindh, Pakistan: A Logistic Regression Analysis. *Journal of Grassroots*, 52(1).

Albayrak, N., & Abdioğlu, Z. (2017). Türkiye'de iç göçü etkileyen faktörlerin analizi. *Researcher*, *5*(3), 293-309.

Altunç, Ö. F.. Uçan, O. & Akyıldız, A. (2017). Dış Göçlerin Türkiye Ekonomisinde İşsizlik Enflasyon Ve Ekonomik Büyüme Üzerine Etkileri: Ekonometrik Bir Analiz. *Researcher*, 5(1), 197-211.

Başel, H. (2007). Türkiye'de nüfus hareketlerinin ve iç göçün nedenleri. In *Journal of Social Policy Conferences* (No. 53, pp. 515-542).

Bayraktar, Y. & Özyılmaz, A. (2019). Türkiye'de iç göç ve ekonomik büyüme. *İş ve Hayat*, 5(9), 100-111.

Bayraktar, Y. & Özyılmaz, A. (2017). The Role of Internal Migration on Regional Inequality: Turkey Example. *Turkish Journal of Middle Eastern Studies*, Special Issue: 9-30.

Brunow, S., Nijkamp, P., & Poot, J. (2015). The impact of international migration on economic growth in the global economy. *In Handbook of the economics of international migration* (Vol. 1, pp. 1027-1075). North-Holland.

Bülbül S. & Köse, A. (2010). Türkiye'de Bölgelerarası İç Göç Hareketlerinin Çok Boyutlu Ölçekleme Yöntemi ile İncelenmesi. *İstanbul Üniversitesi İşletme Fakültesi Dergisi*, 39: 75-94.

Boubtane E. Dumont J.C & Rault C. (2014). Immigration and Economic Growth in the OECD Countries, 1986-2006. *IZA Discussion Paper*, 8681:1-33.

Bove V.& Elia L. (2017). Migration, Diversity, and Economic Growth. *World Development*, 89: 227-239.

Chandrasekhar, S., & Sharma, A. (2014). Internal Migration for Education and Employment Among Youth in India. *Indira Gandhi Institute of Development Research (IGIDR)*, Mumbai, India.

Chen, H. J., & Fang, I. H. (2013). Migration, social security, and economic growth. *Economic Modelling*, 32, 386-399.

Chen, H. J. (2006). International migration and economic growth: a source country perspective. *Journal of Population Economics*, 19(4), 725-748.

Çalışkan, Ş., Karabacak, M., & Meçik, O. (2013). Türkiye'de eğitim-ekonomik büyüme ilişkisi: 1923-2011 (Kantitatif bir yaklaşım). *Yönetim Bilimleri Dergisi*, 11(21), 29-48.

Çatalbaş, G. K., & Yarar, Ö. (2015). Türkiye'deki bölgeler arası iç göçü etkileyen faktörlerin panel veri analizi ile belirlenmesi. *Alphanumeric Journal*, *3*(1), 99-117.

Çetin, İ., & Çetin, S. (2018). Türkiye'de iç göçün belirleyicilerinin analizi. *Yönetim ve Ekonomi Araştırmaları Dergisi*, *16*(1), 98-115.

Demirtaş, G , Çakırca, Ş , Aksel, E . (2021). Türkiye'de Bölgesel Kalkınmanın Bir Belirleyicisi Olarak Uluslararası Göç Üzerine Ampirik Bir Analiz . *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 10 (1) , 85-108.

Deshingkar, P. (2006). Internal Migration, Poverty and Development in Asia. *ODI Briefing Paper*: 1-11.

Dücan, E. (2016). Türkiye'de İç Göçün Sosyo-Ekonomik Nedenlerinin Bölgesel Analizi. *Ekonomik ve Sosyal Araştırmalar Dergisi*, 12(2): 167-183.

Engin, C., & Konuk, T. (2020). Türkiye Ekonomisinde Uluslararası Göçün İşsizlik Ve Ekonomik Büyüme Üzerine Etkisi: Ekonometrik Bir Analiz. *Kahramanmaraş Sütçü İmam Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 10(1), 103-123.

Eshetu, F., & Beshir, M. (2017). Dynamics and Determinants of Rural-Urban Migration in Southern Ethiopia. *Journal of Development and Agricultural Economics*, 9(12): 328-340.

Etzo, I. (2008). Internal migration and growth in Italy, *MPRA Paper*.

Falaris, E. M. (1979). The Determinants of Internal Migration in Peru: An Economic Analysis. *Economic Development and Cultural Change*, 27(2): 327-341.

İşcan, İ. H., & Demirel, T. (2021). Göçün Gelişmiş Ülkelerde Büyüme ve İstihdam Piyasası Üzerine Etkileri: Bir Panel ARDL Analizi. *Ekoist: Journal of Econometrics and Statistics,* (35), 181-203.

Kandemir, O. (2017). Refah Göstergeleri Bağlamında Türkiye'de İller Arası İç Göç Hareketlerinin Analizi. *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 6(1), 275-288.

Kaypak, Ş., & Bimay, M. (2016). Suriye savaşı nedeniyle yaşanan göçün ekonomik ve sosyo-kültürel etkileri: Batman örneği. *Batman Üniversitesi Yaşam Bilimleri Dergisi*, 6(1), 84-110.

Keshri, K., & Bhagat, R. B. (2013). Socioeconomic Determinants of Temporary Labour Migration in India: A Regional Analysis. *Asian Population Studies*, 9(2): 175-195.

Kırdar, M. G. & Saracoğlu, D. Ş. (2012) . İç Göç, Bölgesel Yakınsama Sorunu ve Ekonomik Büyüme: Türkiye Örneği, *Tartışma Metni No. 2012/75, Türkiye Ekonomi Kurumu*, Ankara.

Meçik, O , Koyuncu, T . (2020). Türkiye'de Göç ve Ekonomik Büyüme İlişkisi: Toda-Yamamoto Nedensellik Testi . *İnsan ve Toplum Bilimleri Araştırmaları Dergisi*, 9 (3) , 2618-2635.

Murata, A. (2018). International migration and remittances for economic development in Bangladesh: An overview. *Economic and Social Development of Bangladesh*, 93-113.

LeSage, J. & Pace, R. K. (2009). *Introduction to Spatial Econometrics*. Chapman and Hall/CRC.

Ondes, H., & Kizilgol, O. A. (2020). Türkiye'de İç Göçü Etkileyen Faktörler: Mekânsal Panel Veri Analizi. *Business and Economics Research Journal*, *11*(2), 353-369.

Pazarlıoğlu, M. V. (2007). İzmir Örneğinde İç Göçün Ekonometrik Analizi. *Yönetim ve Ekonomi: Celal Bayar Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 14(1): 121-135.

Roy, N. & Depnath A. (2011). Impact of Migration on Economic Development: A Study of Some Selected State. *International Conference on Social Science and Humanity.*

Şantaş, G. (2019). Türkiye'de İç Göçün Dağılımı. *Sosyal Politika Çalışmaları Dergisi*, 19(45), 893-917.

Tanrikulu, F. (2020). Impact of international migration on patents, innovation, economy and business strategy. *In Strategic Outlook for Innovative Work Behaviours* (pp. 221-234). Springer, Cham.

Topbaş F. & Tanrıöver, B. (2009). Türkiye'de İç Göç Akımları Üzerine Bir Çalışma: Lowry Hipotezi. *Dokuz Eylül Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 24(1): 93-104.

TUİK (Türkiye İstatistik Kurumu). www.tuik.gov.tr

Yap, L. (1976). Internal Migration and Economic Development in Brazil. *The Quarterly Journal of Economics*, 90(1): 119-137.