POVERTY INDICATORS LEADING TO INTERNAL MIGRATION IN TURKEY: AN EMPIRICAL ANALYSIS WITH PROVINCIAL DATA

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Abstract

"Migration" and "poverty" are two separate processes that are related to each other. The reason these two processes are related is that poverty appears both as a cause and a consequence of migration. Individuals who are poor in their region often remain poor in the regions they migrate to. Turkey is a country with high levels of inter-provincial migration. Migrations generally occur from the east to the west of the country. In this study, the relationship between poverty and migration is examined within the context of inter-provincial migration in Turkey and the poverty indicators that lead to it. The purpose of this article is to identify poverty indicators that lead to inter-provincial migration in Turkey. The relationship between 20 poverty indicators for all 81 provinces in Turkey and net migration rate data was attempted to be revealed using factor analysis. The average of the 2015-2023 data for each variable was used in the analysis. This article differs from the other studies in the literature by including all 81 provinces in Turkey and examining the relationship between migration and a large number of poverty indicators.

The analysis revealed that poverty indicators can be represented by five factors. The first factor, considering the most influential variables, was named "high dependency ratio and adverse economic conditions." The findings related to the first factor showed that migration decreases as the child dependency ratio, age dependency ratio, and the proportion of those who cannot meet their basic needs increase. The second factor is called "lack of education." The second factor, largely determined by the proportion of those who cannot continue their basic education, is inversely related to migration. The third factor is named "university education." The fourth and fifth factors are respectively named "health infrastructure" and "quality of life." The poverty indicators that make up the third, fourth, and fifth factors have a positive interaction with migration.

Keywords: Migration, poverty indicators, factor analysis

JEL Codes: R23, I32, C38

1. Introduction

"Migration" and "poverty" are two separate processes that interact with each other and are often intertwined. Migration from one place to another due to poverty can lead to the continuation of poverty if negative conditions are encountered at the destination. Therefore, poverty can appear both as a cause and a consequence of migration. Only a portion of those who migrate from one region to another as a result of poverty are able to achieve better conditions. Individuals or families who are poor in their region of origin often remain poor in the regions they migrate to. Thus, the vicious cycle of poverty-migration-poverty continues.

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Of course, individual characteristics are of great importance in bringing about this result. Immigrants who have better conditions in terms of education level and certain skills often break this vicious cycle by encountering better conditions in the places they go. Poverty, social exclusion, working in the informal sector, and living in shantytowns are social problems that are re-experienced as a result of migration.

The course of migration in Turkey has been from villages to cities and from the eastern provinces of the country to the western provinces. In 1980, the share of the village population in the total population was 56.1%, while the share of the urban population in the total was 43.9%. By 2021, these rates were 93.1% and 6.9% respectively (TÜİK 2014 and TÜİK 2022). In 2024, the net migration rate in Ağrı province, located in eastern Turkey, was (-32.6) per thousand, in Muş province it was -27.3 per thousand, and in Siirt province it was (-34.0) per thousand. In contrast, the net migration rate in Yalova province, located in western Turkey, was 15.6 per thousand, in Muğla province it was 11.6 per thousand, and in Antalya province it was 9.1 per thousand (TÜİK, 2024).

In this study, the relationship between poverty and migration is examined within the context of inter-provincial migration in Turkey and the poverty indicators that lead to it. The purpose of this article is to identify poverty indicators that lead to inter-provincial migration in Turkey. Thus, various policy recommendations can be developed to reduce migration between provinces.

There are numerous valuable studies in Turkey that address the issue of "migration and poverty." These studies can be grouped into two categories. The studies in the first group are those that examine the phenomenon of "migration and poverty" at a specific provincial or regional level, often collecting data through surveys or personal interviews. In these studies, detailed data was collected with the help of numerous questions, and the topic was analysed in-depth for the region under consideration. Research conducted by Işık and Pınarcıoğlu (2003); Erkan and Bağlı (2005); Göktürk and Akkaya (2006); Tümtaş (2009); Yıldız and Alaeddinoğlu (2011); Tümtaş and Ergun (2014); Kahraman (2015); and Şen and Şen (2015) can be given as examples of studies in this group.

In the studies included in the second group, the phenomenon of "migration and poverty" in Turkey was analysed within the context of statistical regional units, for Level 1 and Level 2 regions. The biggest distinguishing feature of these studies from those in the first group is the use of secondary data. The use of secondary data instead of primary data in these studies has led to a limited number of variables being included in the analyses. Additionally, the number of studies in Turkey that address internal migration and poverty using secondary data is limited. Zanbak and Özgür (2019); Aktaş and Şahin (2019); Zanbak (2020); and Sancar and Akbaş (2022) are the main examples of studies in this group.

In light of these findings, this research differs from existing studies in the literature in three ways. First, all 81 provinces in Turkey were included in the analysis. Thus, unlike studies that typically include statistical regional units at Level 1 and Level 2 in the analysis, provinces, referred to as Level 3 regions, have also been included in the analyses for the first time. In migration and poverty studies in Turkey, there is not any study that includes all provinces in the analysis. Secondly, in studies where analyses were based on secondary data, the topic was examined using a small number of variables. However, in this study, a large number of poverty indicators selected from the Human Poverty Index and the Global Multidimensional Poverty Index were determined as variables and included in the analyses along with the migration variable. Thus, which poverty indicators are more decisive for migration has been examined in detail. Finally, this research also differs from other studies based on secondary data in terms of the analysis method used. While panel data analysis and econometric models are often preferred in other studies based on secondary data, factor

analysis, a multivariate statistical analysis method, was used in this study due to the large number of variables.

In the empirical analyses, 21 variables were used. The data used in the analyses is from the period 2015-2023. All the data used has been compiled from the websites of the Turkish Statistical Institute (TÜİK).

The article consists of five sections. In the second section, following the introduction, the concepts of "poverty" and "migration" are discussed. The third section is dedicated to the literature review. While the fourth chapter examines the empirical analysis and findings, the fifth chapter consists of the "conclusion" section.

2. Poverty and Migration

2.1. Poverty

"Poverty" is a phenomenon with economic, social, and political dimensions. These different dimensions have led to poverty being defined in different ways. Poverty, in a general sense, refers to the state of society falling below a certain level of living standards. Of course, the scope of poverty varies from time to time and from place to place. In the initial definitions of poverty, income was the primary factor, and poverty was defined as not having sufficient income to meet basic needs. This definition, which is based solely on income, was later considered inadequate, and more comprehensive definitions were developed. According to one of these comprehensive definitions, poverty is "a phenomenon that encompasses all dimensions of human life, including political and social participation, education, health, and human rights, in addition to economic poverty" (Coşkun & Tireli, 2008: 23). Poverty is classified in four ways. These are: absolute poverty, relative poverty, human poverty, and multidimensional global poverty. Since the poverty indicators we will use in our empirical analyses will be determined by utilizing these poverty definitions, these concepts will be briefly introduced here.

2.1.1. Absolute Poverty

This refers to the situation where people are unable to meet their minimum basic needs to survive. In calculating absolute poverty, the market value of goods needed to survive is determined, and this determined amount is considered the poverty line. It is inconceivable that this approach treats people as social beings (Polat & Erdoğan, 2020: 210).

2.1.2. Relative Poverty

This is a broader definition of poverty than the concept of absolute poverty. It allows poverty to be measured based on a society's traditional way of life. Those who advocate for relative poverty measurement argue that poverty cannot be measured by universal standards, and that each society should determine poverty within the framework of its own cultural values.

2.1.3. Human Poverty

Human poverty is measured by the human poverty index developed by the United Nations Development Program in 1997. The human poverty index, which includes dimensions of poverty other than income, is composed of different components for developing countries and OECD countries. These components are listed in Table 1.

Table 1: Components of the Human Poverty Index

Components of the Human Poverty Index for Developing Countries			
Long and Healthy Life	*Knowledge*	A Good Standard of Living	
Those who are not likely to live to 40 at birth	Percentage of adult illiterates	Percentage of the population without access to improved water sources	Percentage of children who are underweight for their age
Components of the Human Poverty Index for OECD Countries			
Long and Healthy Life	*Knowledge*	A Sufficient Standard of Living	Social Exclusion
Those who are not likely to live to 60 at birth	Percentage of those without functional literacy skills	Percentage of people living below the poverty line	Long-term unemployment rate

Source: UNDP, Human Development Report 2004, p. 258.
https://hdr.undp.org/sites/default/files/reports/265/hdr_2004_complete.pdf, Access date :19.02.2022.

2.1.4. Global Poverty

Global poverty is measured by the global multidimensional poverty index, developed by the United Nations in 2010 to replace the human poverty index. The index is composed of three subcomponents: health, education, and living standards, and 10 indicators. The index components and sub-indicators are listed in Table 2.

Table 2: Components and Sub-indicators of the Global Multidimensional Poverty Index

Dimensions	Indicators	Contents of the Indicators
Health	Nutrition	The number of individuals under 70 years of age and children who do not receive 2400 kcal of food per day.
	Child Mortality	Child deaths under 18 in the last 5 years
Education	Year of Schooling	No one over the age of 10 in the family has completed 6 years of schooling.
	School Enrolment	The presence of children of school age who are not enrolled in school.
Living Standards	Cooking Fuel	Whether households cook their meals with brushwood, coal, or wood.
	Sewerage	The lack of sanitation facilities such as sewerage for households, or sharing them with other households even if they are available
	Drinking Water	Households lacking access to drinking water or having safe drinking water located at least a 30-minute walk from their home
	Electricity	Household does not have electricity
	Shelter	At least one component of the house, such as the roof, walls, or floor, is not made of suitable material
	Assets	The household does not own more than one of the following assets: radio, TV, telephone, computer, horse-drawn cart, bicycle, or refrigerator, and does not own a car

Source: UNDP, Global Multidimensional Poverty Index, page:2.
https://www.tr.undp.org/content/turkey/tr/home/library/human_development/2020-Multidimensional-Poverty-Index-MPI.html, Access Date: 19.02.2022.

2.2 .Migration

The phenomenon of migration, which has existed in every period of human history from its emergence to the present day, is, in the most general and simplest terms, the displacement of people. Migration has been defined in different ways. One of the earliest definitions was made by Lee (1966). According to this definition, migration is a permanent or temporary change of location (Lee, 1966: 49). According to Faist, migration is the permanent or temporary change of one's place of residence by moving outside of an administrative boundary (Faist, 2003: 41). Keleş (1998:58) defines migration as "generally, the act of moving from one settlement to another with the intention of settling." Karahan (2006:10) defines it as "the change of society and place of residence as a result of natural, economic, or political necessities." According to a more comprehensive definition, "migration is a geographical, social, and cultural movement from one place to another, driven by economic, ecological, or individual reasons, with the goal of short, medium, or long-term return or permanent settlement" (Yalçın, 2004: 13).

The main point emphasized in these definitions is that the phenomenon of migration encompasses a geographically-based displacement. Although not explicitly stated in these definitions, migration is an event that leads to a number of social, economic, cultural, and demographic changes in regions and countries that receive and send migrants. Migration is classified in different ways. Faist (2003) used five criteria for classifying migrations. These criteria have been determined as area, time, size, cause, and legal status. According to the area criterion, migrations are divided into "internal migration" and "external migration." According to the time criterion, a distinction is made between "temporary migration" and "permanent migration." Based on the size, a classification into "individual migration," "mass migration," and "group migration" has been preferred. The cause criterion led to the distinction between "voluntary migration" and "forced migration," while the legal status criterion resulted in the distinctions between "legal migration" and "illegal migration" (Faist, 2003: 47).

Yalçın (2004) classified migrations into four categories: primitive migration, forced migration, free migration, and mass migration (Yalçın, 2004:14). According to another classification, migrations are divided into three groups: migrations caused by natural disasters, migrations caused by unemployment, and migrations caused by social events (Şahin & Doğanay, 1999: 165). Özkalp (1990: 209) classified migrations into individual migration and family migration. In another study, migrations were also divided into voluntary and involuntary (Tümtaş & Ergun, 2014: 4).

3.Literature

The relationship between migration and poverty began to be intensively addressed in the 2000s. One of the most cited studies on this topic was conducted by Chapman and Bernstein (2003) for the United States, covering the period from 1989 to 2000. The authors' findings showed that poverty in California did not increase as a result of migration, while it did in New York. In another study related to the US, it was found that in 1980, the increase in the agricultural population in the US reduced poverty by 1990, the direction of the effect had changed (Martin and Taylor, 2003).

Rogan et al. (2009) examined the relationship between internal migration and poverty, focusing on the Kwa-ZuluNatal region in South Africa. The research findings revealed a strong relationship between internal migration and poverty.

The poverty experienced as a result of forced migration was examined in detail in the study conducted by Işık and Pınarcıoğlu (2003) on Sultanbeyli. The authors have reached

findings that poverty is deepening as a result of forced migration. Erkan and Bağlı (2005) examined the integration tendencies and economic situations of individuals who migrated to Diyarbakır for various reasons between 1990 and 2003. Observations made on 200 families who migrated to Diyarbakır indicated that the migration to Diyarbakır resulted in the onset of ruralisation, slum development, and impoverishment in the city (Erkan and Bağlı, 2005:122).

Similar findings were also observed by Göktürk and Akkaya (2006) regarding the province of Mersin, which receives a large amount of forced migration. Yıldız and Alaeddinoğlu (2011) examined the phenomenon of migration and poverty in the context of Hakkâri, utilizing survey data collected from 160 households. The authors observed that the majority of those who migrated to Hakkari province came after the 1990s due to forced reasons, and that families who lived in relative poverty in rural areas before migration were driven into deeper poverty after migration. The same research findings showed that families who settled in the city of Hakkari after migration began to consume fewer fruits and vegetables. Additionally, the number of patients per doctor in the city of Hakkâri has also increased due to migration (Yıldız and Alaeddinoğlu, 2011:458).

Bustillo and Anton (2009) found that migrants from one region to another in Spain between 2004 and 2006 were poorer than the local population in the region they migrated to. Güneş (2009) stated that those who migrated to Eskişehir from surrounding regions brought poverty with them. In the same study, it was observed that migrant women experience a poverty more.

In their 2013 study examining the relationship between migration and poverty in Level 1 regions, Demir et al. identified the reasons for migration in the regions that experienced the highest levels of out-migration between 1999 and 2011. During the period 2007-2009, it was observed that Bursa was the province with the highest net migration, while Ağrı, Diyarbakır, and Erzurum were the provinces with the highest net out-migration. While terrorism and rapid population growth were identified as the most significant reasons for migration in the provinces of Ağrı and Diyarbakır, harsh climate conditions were observed as the most significant reason for migration in the province of Erzurum.

According to the same study, during the 2009-2010 period, migration shifted toward Istanbul due to the closure of some factories in Bursa province. During this period, the region with the highest out-migration was the Western Black Sea Region, while in the 2010-2011 period, it was determined to be the Central Eastern Anatolia Region (Demir et al. 2013:101). Tümtaş (2009) examined the relationship between migration and poverty by analyzing the examples of Marmaris and Mersin, which receive a large number of migrants during the tourism season. In a study where data was collected through a survey method, the findings related to Marmaris showed that those who migrated to this region generally did so to achieve better economic conditions. However, one-third of the migrants lived below the poverty line and had no social security. Findings related to Mersin also revealed that economic reasons were influential on migration to Mersin. Similar to Marmaris, a significant portion of those who migrated to Mersin stated that they earned incomes below the poverty line.

Tümtas and Ergun (2014) examined the phenomenon of migration and poverty through a study of 3560 families in the province of Van, which faces both forced and voluntary migration. Research findings indicate that 52.7% of the population in Van province are immigrants, and the biggest problem for individuals in this group is unemployment. According to the same research, the average household income in Van province in 2014 was calculated as 1117.84 TL, which was close to the poverty line of 1099.17 TL set for that period (Tümtaş and Ergun, 2014, p.20).

Şen and Şen (2015) conducted a detailed examination of the economic situations, housing locations, and working conditions of immigrant groups who settled in the Eminönü-Süleymaniye region. The assessments in the study are based on data collected from a survey

administered to 224 immigrants living in the Süleymaniye region between October 2011 and April 2013. The findings show that this region is the most preferred settlement for the single population migrating to Istanbul due to its characteristics of providing affordable housing and being close to workplaces.

Kahraman and Gül (2015) examined internal migration and child poverty in Turkey, using the province of Gaziantep as an example. Analyzes conducted on the children of families who immigrated to Gaziantep, which receives significantly more migration from other provinces in the region due to being the most developed province in the South eastern Anatolia Region, have revealed striking results regarding migration and child poverty. For example, in families who migrated to Gaziantep, most parents were unable to find permanent employment. This often led to some of the children working in temporary jobs. A significant portion of the children interviewed stated that they were able to continue their education . The study also examined the spatial risks children face and the living conditions they imagine.

In their study on internal migration and interregional economic convergence in Russia, Gruev and Vakulenko (2015) found an inverse relationship between migration and income in Russia between 1996 and 2010.

Yüceol (2017) examined the effects of rural-to-urban migration on women's employment. The low education levels of migrant women lead to the continuation of female poverty in cities as well.

Zambak and Özgür (2019) examined the effects of migration from the agricultural regions to regions with a high concentration of industry and service sectors in. In analyzes conducted in Turkey, which included 12 regions at Level 1, no significant relationships were found between migration, per capita gross domestic product, and the number of poor people.

4. Empirical Analysis

The relationship between poverty and migration in Turkey was attempted to be revealed using 21 variables (See Table 3). In the analyses, all 81 provinces were taken as observations. Poverty indicators and net migration rate were included in empirical analyses together as a result of the fact that the phenomena of "migration" and "poverty" are both the cause and the consequence of each other.

4.1. Analysis Method

The relationship between poverty and migration was examined using factor analysis, a method aimed at revealing the relationships between variables. The reason for preferring factor analysis is that it is one of the most successful methods in revealing the relationships between variables in analyzes where a large number of variables are used. The most significant difference between this research and other studies in the literature is, as mentioned earlier, the inclusion of a large number of poverty indicators in the analysis. Therefore, in this study where a large number of variables are used, factor analysis would be the correct approach to choose.

Factor analysis is a method that reduces a large number of interrelated variables into a small number of meaningful and independent factors or new variables. In factor analysis, a set of variables with high correlations among them is grouped together to form general variables called factors (Kalaycı, 2009: 321).

4.2. Variables Used

The 21 variables used in the analyses are listed in Table 3. The variables used are grouped under the components of health, education, living standards, demography, and migration. The groupings made in the Human Poverty Index and the Global Poverty Index were utilized in determining the component names.

Table 3: Variables Used in Empirical Analyses

	Variable name	Literature using the Variable	Abbreviations used in the Analysis
	Health		
1	Life expectancy at birth (years)	Human Poverty Index	Lifeexpectancy
2	Number of physicians per one hundred thousand people	Erdoğan (2014)	physicians
3	Number of hospital beds per one hundred thousand people	Erdoğan (2014)	Hospitalbeds
4	Infant mortality rate	Global Multidimensional Poverty Index (2010), Erdoğan (2014)	Infantmortality
	Education		
5	Percentage of women aged 6 and over who are illiterate	Human Poverty Index (1997), Erdoğan (2014), Zanbak (2020)	Womenilliteracy
6	Percentage of men aged 6 and over who are illiterate	Human Poverty Index (1997), Erdoğan (2014), Zanbak (2020)	Menilliteracy
7	The rate of those who should be enrolled in primary education but are not	Global Multidimensional Poverty Index (2010)	Primary
8	The percentage of girls who should be enrolled in primary school but are not	Global Multidimensional Poverty Index (2010)	Primarygirl
9	The percentage of students who should be enrolled in secondary education but are not	Global Multidimensional Poverty Index (2010)	Secondary
10	The percentage of girls who should be enrolled in secondary education but are not	Global Multidimensional Poverty Index (2010)	Secondarygirl
11	Percentage of faculty and college graduates	Erdoğan (2014)	Universitygraduates
	Living Standards		
12	Unemployment rate (%)	Human Poverty Index (1997	Unemployment
13	GDP per capita ($)		Income
14	Share of the urban population not served by the sewage network ,(%)	Global Multidimensional Poverty Index (2010)	Sewage
15	Share of the city population not served by the drinking and utility water network, (%)	Global Multidimensional Poverty Index (2010)	Waternetwork
16	The percentage of people experiencing problems with the quality of their housing	Global Multidimensional Poverty Index (2010)	Housing
17	Percentage of households declaring they cannot meet their basic needs	Human Poverty Index (1997	Basicneeds
18	Number of cars per thousand people	Global Multidimensional Poverty Index (2010)	Cars
	Demographics		
19	Total age dependency ratio	Zambak(2020)	Agedependency
20	Child dependency ratio	Erdoğan (2014)	Childdependency
	Migration		
21	Net migration rate		Netmigration

Source: Prepared by the author.

Table 3 includes the variables used to reveal the relationship between migration and poverty. Table 3 not only includes the variables we used in the empirical analyses but also summarizes the literature in which these variables are used. In the analyses, all 81 provinces in Turkey were considered as observations. The data used in the analysis is from the period 2015-2023. By calculating the average values for each variable across the years within this period range, a single year's data was obtained. All the data was compiled from the websites of the Turkish Statistical Institute (TÜİK).

4.3. Empirical Findings

The first step before starting factor analysis and other similar multivariate statistical analysis methods is to standardize the variables expressed in different units of measurement. The data that will be included in the empirical analysis is expressed in different units of measurement, such as percentages, per thousand, numbers, and dollars. Therefore, the first step before factor analysis is to standardize the data.

After standardizing the data, the first step is to assess the suitability of the factor analysis method for the dataset. The suitability assessment is conducted using two methods. One of the methods used for this purpose is the creation of a correlation matrix. High correlations between variables mean that the variables will form common factors. Whether factor analysis can be used is determined by two separate tests. The first of these tests is the sphericity test developed by Bartlett. In the Bartlett test, an attempt is made to determine whether there is any relationship between the variables within the population. The null hypothesis (H0) states that there is no relationship between the variables, while the alternative hypothesis (H1) indicates the presence of a relationship. If H0 hypothesis is rejected, it indicates that there are high correlations between the variables and that the dataset is suitable for factor analysis.

Another test that determines whether factor analysis can be used is the Kaiser-Meyer-Olkin (KMO) test of sampling adequacy. The KMO test measures sample adequacy. The magnitude of the correlation coefficients observed with the KMO test is compared to the magnitude of the partial correlation coefficients. The KMO should be above 0.5. In some studies, this ratio was desired to be above 0.6 (Kalaycı, 2009: 321-322; Norusis, 1993: 52). Therefore, if the value found in the KMO test is below 0.50, the sample is considered insufficient; 0.50 is considered "weak," 0.60 "moderate," 0.70 "good," 0.80 "very good," and 0.90 "excellent" (Sharma, 1996: 116). KMO is calculated using equation "1".

$$KMO = \frac{\sum\limits_{i \neq j} \sum r_{ij^2}}{\sum\limits_{i \neq j} \sum r_{ij^2} + \sum\limits_{i \neq j} \sum a_{ij^2}} \tag{1}$$

Table 4: KMO and Bartlett's Test Results

KMO and Bartlett Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,843
Bartlett's Test of Sphericity	Approx. Chi-Square	1610,813
	Df	210
	Sig.	,000

In the equation 1, r_{ij} represents the simple correlation coefficient between variables "i" and "j". The a_{ij} in the denominator represents the partial correlation coefficient between "i" and "j".

To test whether the data is suitable for factor analysis, the results of the KMO and Bartlett tests in Table 4 were examined. KMO coefficient of 0.843 indicates that the sample size is at a very good level, demonstrating that the number of data points is sufficient for factor analysis.

According to Table 4, the Bartlett's test of sphericity value is 1610.813. This value is valid at a significance level of 0.00. It is desired that the significance level be less than 0.05. In this case, the null hypothesis is rejected. So, Bartlett's test of sphericity was found to be significant. There are high correlations between the variables. In other words, the dataset is suitable for factor analysis.

Table 5: Total Variance Table

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8,728	41,564	41,564	8,728	41,564	41,564
2	3,239	15,421	56,985	3,239	15,421	56,985
3	1,646	7,840	64,825	1,646	7,840	64,825
4	1,354	6,446	71,271	1,354	6,446	71,271
5	1,269	6,042	77,313	1,269	6,042	77,313
6	,977	4,651	81,964			
7	,731	3,481	85,445			
8	,611	2,908	88,353			
9	,552	2,628	90,981			
10	,386	1,840	92,821			
11	,283	1,348	94,168			
12	,266	1,265	95,433			
13	,236	1,122	96,555			
14	,153	,730	97,286			
15	,135	,643	97,928			
16	,116	,554	98,482			
17	,096	,459	98,941			
18	,092	,437	99,378			
19	,059	,279	99,657			
20	,044	,209	99,867			
21	,028	,133	100,000			

The eigenvalues in the total variance table (Table 5) are the total variance values explained by each factor. Any factor with an eigenvalue less than 1 does not have sufficient total variance to represent a single factor and is therefore disregarded. According to the total variance results, components after the fifth will not be considered in subsequent parts of the analysis because they have eigenvalues less than one. The cumulative total variance explained by five components with eigenvalues above 1.00 is 77.313% (Table 5). Therefore, the 21 variables are grouped around five factors.

To determine which factor is influenced by which variables, we need to examine the rotated component matrix.

Table 6: Rotated Component Matrix [a]

	Component				
	1	2	3	4	5
Zscore(Childdependency)	,855	-,144	-,074	,376	-,034
Zscore(Basicneeds)	,853	-,146	,014	,189	,146
Zscore(Agedependency)	,841	-,075	-,259	,219	,094
Zscore(Housing)	,837	,037	-,047	,083	,197
Zscore(Womenilliteracy)	,835	,125	-,102	-,107	,370
Zscore(Secondarygirl)	,827	,097	-,119	,332	-,103
Zscore(Cars)	-,823	-,201	,131	-,157	-,236
Zscore(Menilliteracy)	,806	,079	-,115	-,108	,413
Zscore(Income)	-,692	-,204	,452	,125	-,275
Zscore(Unemployment)	,604	-,128	,507	,299	-,075
Zscore(Infantmortality)	,599	,036	-,202	,343	-,221
Zscore(Primarygirl)	-,117	,965	,049	,084	,023
Zscore(Primary)	-,263	,847	-,013	,068	,113
Zscore(Secondary)	,370	,845	,011	,276	,000
Zscore(Netmigration)	-,268	-,802	,136	,258	,142
Zscore(Universitygraduates)	-,468	-,061	,756	-,175	-,180
Zscore(Lifeexpectancy)	-,099	,191	,650	-,084	,521
Zscore(Hospitalbeds)	-,213	-,113	,034	-,770	-,162
Zscore(physicians)	-,240	-,150	,489	-,549	-,210
Zscore(Waternetwork)	,242	,011	-,112	,127	,662
Zscore(Sewage)	,219	-,116	,057	,382	,517
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalization.[a]					
a. Rotation converged in 13 iterations.					

Table 6 shows the variables affecting each factor. Let's identify the variables that have a high correlation with each factor one by one:

First factor: The variables with a positive correlation to the first factor are: child dependency ratio (factor loading 0.855), percentage of those who cannot meet their basic needs (0.853), age dependency ratio (0.841), percentage of those experiencing problems with housing quality (0.837), percentage of women aged 6 and over who are illiterate (0.835), percentage of girls who should be enrolled in secondary education but are not (0.827), percentage of illiterate men (0.806), unemployment rate (0.604), and infant mortality rate (0.599). Factor 1 has a negative correlation with the variables: number of cars per thousand people (-0.823) and income per person (-0.692). The first factor, considering the most influential variables, has been named "high dependency ratio and adverse economic conditions."

Second Factor: The variables "The percentage of girls who should be enrolled in primary school but are not " (0.965), " The rate of those who should be enrolled in primary

education but are not " (0.847), and " The percentage of students who should be enrolled in secondary education but are not " (0.845) are positively correlated with the second factor. In contrast, the second factor, due to its factor loading of -0.802, has a negative correlation with the net migration rate variable. Considering these factor loadings, the second factor was named "lack of education."

Third factor: It has high correlations with the variables of the percentage of university graduates (0.756), life expectancy at birth (0.650), and unemployment (0.507). This factor has been named "university education" because it is most affected by the variable "percentage of university graduates."

The fourth factor, named "healthcare infrastructure" is due to its high inverse correlation with the variables of hospital beds per one hundred thousand people (-0.770) and physicians per one hundred thousand people (-0.549). The number of doctors and hospital beds are attractive factors for regions receiving migration and preventing migration to other regions.

Fifth factor: It has a high correlation with the variables of the share of the urban population not served by the drinking water network (0.662), life expectancy at birth (0.521), and the share of the urban population not served by the sewage network (0.517). Since sewage and drinking water network services are services that improve the quality of life, the fifth factor has been named "quality of life."

Using the data in Table 6, the relationship between poverty and migration can be determined by writing the migration function.

$$\text{MIGRATION} = -0.268F_1 - 0.802F_2 + 0.136F_3 + 0.258F_4 + 0.142F_5 \quad (2)$$

Using the migration function, the following observations related with the relationship between migration and poverty can be made:

i) F_1, F_2, F_3, F_4, and F_5 in the migration function represent the first, second, third, fourth, and fifth factors, respectively. The migration function shows that migration has a negative interaction with poverty indicators in the first and second factors, and a positive interaction with poverty indicators in the third, fourth, and fifth factors.

ii) The first factor was named "high dependency ratio and unfavourable economic conditions". The inverse relationship between migration and the first factor means that as the child dependency ratio and the old-age dependency ratio increase, migration will decrease. The age dependency ratio is the sum of the young population (under age 15) and elderly population (age 65 and over)relative to the working-age population (ages 15 to 64). Data are shown as the number of dependents per 100 working-age population. The child dependency ratio indicates the number of children per 100 people in the 15-64 age range. High dependency ratios mean that the working (active) population has a high number of dependents. This situation, as we mentioned in previous sections, increases poverty and poverty prevents migration.

Similarly, the variable "percentage of those who cannot meet their basic needs" which has a high factor loading within the first factor, also supports this result. As the proportion of those unable to meet their basic needs increases, migration will be hindered because the necessary financing for migration will not be available. These findings are similar to those of the study conducted by Gruev and Vakulenko (2015) for Russia. The authors had observed that poverty prevented migration in Russia if income levels fell below a certain level.

iii)According to equation 2, migration is also inversely related to the poverty indicators in the second factor The second factor was named "lack of education". Variables such as "the proportion of those who should be enrolled in primary education but are not" and "the proportion of those who should be enrolled in secondary education but are not" were the variables that strongly influenced this factor. Individuals who have not received a minimum level of education are unlikely to be very willing to migrate to other places. Lack of education emerges as a cause of poverty that hinders migration, similar to the first factor. This findings is also consistent with the results obtained by Zanbak (2020). Indeed, Zanbak's study concluded that women having primary education or below primary education increases poverty.

iv) The migration function shows that migration is positively correlated with the third factor. The third factor was named "university education" because the factor loading of the university variable was high. As the proportion of university graduates increases, migration increases. University graduates are migrating from poor regions to areas and provinces with better conditions.

v) The fourth poverty factor also has a positive correlation with migration. The "health infrastructure" factor, which consists of health-related variables, increases migration. Physicians and hospital facilities are the most important pull factors for the migrated regions, as stated in the push-pull theory.

vi)The fifth factor includes infrastructure indicators such as drinking water and sanitation. The absence of the infrastructure facilities included in this factor leads to the abandonment of some regions, thus increasing migration.

5. Conclusion

"Migration" and "poverty" are two distinct social phenomena that are both the cause and consequence of each other. To explain the phenomenon of migration, its causes, and its consequences, numerous studies have been conducted and certain theories have been developed. In these theories, although only the phenomenon of migration is attempted to be explained, it is observed that the phenomenon of poverty is also considered as a cause or consequence of migration. The main reason for addressing poverty in migration analyzes is that, with the exception of forced migrations, migrations generally occur with the aim of escaping poor socioeconomic conditions. From the day humanity existed to the present, migrations have been made in all eras to achieve better conditions. While international migration flows from less developed to developed countries, internal migration flows from relatively less developed to more developed regions. Today, "migration and poverty" is one of the most important problems in both developed and developing countries. In this study, the relationship between "migration and poverty" is examined within the context of internal migrations in Turkey.

Factor analysis was used to reveal the relationships between net migration rate and poverty variables. The analysis revealed that poverty indicators can be represented by five factors. The first factor, considering the most influential variables, has been named "high dependency ratio and adverse economic conditions." The second factor is named "lack of education," and the third factor is named "university education." The fourth and fifth factors are respectively named "healthcare infrastructure" and "quality of life". Using the findings from factor analysis, the poverty variables (factors) influencing migration have been identified. It has been determined which poverty factors are positively correlated with migration and which are negatively correlated. While the first and second factors have an inverse effect on migration, there is a direct relationship between the third, fourth, and fifth factors and migration.

The first factor was named "high dependency ratio and unfavorable economic conditions." The fact that migration is inversely related to the first factor means that as the child dependency ratio increases, migration will decrease. Similarly, the variables of the total age dependency ratio and the proportion of those who cannot meet their basic needs, which have high factor loadings within the first factor, also support this result. This result indicates that the poverty variables in this factor (dependency ratio and inability to meet basic needs) hinder migration.

Poverty indicators included in the second factor also have an inverse interaction with migration. The second factor was named "lack of education." The inability to continue primary and secondary education, as in the first factor, emerges as a cause of poverty that hinders migration.

The poverty indicators that make up the third, fourth, and fifth factors have a positive interaction with migration. The third factor showed that internal migration increased as the proportion of university graduates increased. This is because individuals with higher levels of education migrate to more developed provinces. The fourth poverty factor also has a positive relationship with migration. The fourth factor, consisting of health-related variables, increases migration. Physicians and hospital facilities are the most important pull factors for the migrated regions, as stated in the push-pull theory. The fifth factor includes infrastructure indicators such as drinking water and sanitation. The lack of such infrastructure leads to increased migration, causing some regions to be abandoned and provinces with these facilities to be preferred.

In this study, the relationship between migration and poverty for 81 provinces was attempted to be revealed. It is believed that a significant contribution has been made to the literature due to the use of numerous variables related to poverty. It is also believed that the analysis method used is original. It is expected that these contributions of the research will shed light on future studies, and that other researchers will investigate the phenomena of poverty and migration using these variables and methods.

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