Interaction between Regional Inequalities and Internal Migration in Turkey

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The ever-changing economic processes in the world influence the economic performances of regions both formed by countries and regions within countries. In spite of the dominant view that the developed regions in a globalizing world will expand more, regional development literature accommodates views which assert that rising economic interactions and technological developments will add to the development of relatively underdeveloped countries in the periphery. On the other hand, studies that analyze regional inequalities show the influence of factor migration. Inter-regional migration of workforce in Turkey is seen as a significant problem due both to the occurrence of new problems in the metropolitan areas and the loss of workforce in underdeveloped regions, it is therefore one of the significant indicators to explain the spatial reflections of economic development.

The aim of this paper is to evaluate internal migration movements between provinces in Turkey in terms of their level of development and to test the features that make developed regions centers of attraction against the locational factor. In addition to the hypotheses that test the locational features of provinces in internal migration, we will discuss the results of regression analysis, which employed socio-economic indicators to measure the effect of regional inequalities on internal migration.

Key words: regional inequality, internal migration, locational features, socio-economic development

1. Introduction: Evaluation on Regional Inequalities and Factors That Cause Migration

Theoretical approaches that try to explain the differences in regional development are currently evolving with new contributions and continue forming the agenda. Various authors assert the view that developed or core regions will always be more advantageous with their onset in the cumulative process and that inequalities will grow in the absence of intervention (Hirschman, 1965; Myrdal, 1972; Sant, 1987; Aghion and Williamson, 1998; Krugman, 1993). The flow of skilled labor, as a phenomenon that arises from and increases regional differences, from the periphery-underdeveloped regions to developed-core regions is stressed (Cheshire and Carbonaro, 1996; Hodgkinson, *et al.*, 2001; Krugman, 1993; Venables, 1996).

According to the neoclassical growth theory, capital moves to where profits are the highest, and the labor to where the wages are. But in fact, there are many other agents that affect factor movements besides interregional differentiation of factor prices. In numerous countries historically in every period disadvantaged regions have lost population through migration. The indicators of regional migration are more complicated than the classical model. The classical model defines the *income differences* between in-migrated and out-migrated regions as the most attractive factor. For developed countries, other than the difference in income, factors such as *peripheral qualities* and *climate* are also effective. Job opportunities have an undoubtedly major effect on migration. In this perspective, it is claimed that migration should ideally be modeled as part of the labor market (Muth, 1971; Vanderkamp, 1989). Job opportunities draw population to their location and its factor effects will increase the local consumption and expenditures in its locality. There are research findings that support the fact that unemployed people tend to migrate twice as much as employed ones (Hughes and McCormick, 1990). It is seen that in developed countries *neighboring regions* are preferred more for migration (Skeldon, 1990).

The characteristics of out-migrating and in-migrated regions are accepted as the main indicators of migration. If the characteristics of in-migrated provinces are effective on migration pull effect would be dominant, if the characteristics of out-migrating provinces are effective on migration it would be push effect. However, it should be known that a two-way impact is the case with internal migration. In more detail, two types of indicators are emphasized; these are the *institutional structures* of regions where migration starts, and the *individual and family characteristics* of migrants. Further, there are assumptions that younger and better educated people prefer to migrate (Antolin and Bover, 1997). Migrants generally follow the path that the previous generation had taken.

Explaining the factors that lead to migration has been the most problematic in this field of study. Reliable obtainability of migration data is indispensable for more detailed studies. In this sense, movements of migration are measurable only when “one passes across a boundary” and are identified with the political-administrative structure of a country (Skeldon, 1990).

Migration is defined as changes made in places of settlement in a certain period of time between administratively defined regions (Tekeli, 1998; İçduygu and Ünalan, 1998; Hoşgör, 1998). It is encountered especially in developing countries “at individual level, as a means of accession to economic benefits and survival” (Atalık and Çıracı, 1993). While Tekeli (1998) states that internal migration analyses regained significance in Turkey and that new

problematic areas emerged, in this context he defines the qualities of internal migration as a category of relations between man and space in the modern society.

It is seen that the internal migration movement[1], which gathered speed in Turkey from the 1950s, on is influential on the country's economic, social and spatial structures. Of these impacts, it is the economic impact whose reflection is seen most on the society. Among the studies on migration and economy in this context, the study by Özmucur and Silber (2002) analyzed the effect of migration on spatial inequality for the years 1987 and 1994, and also researched the income composition of internal migration, the importance of the size of household and the effect of proximity to different regions. As a result of this study it was proven that internal migration from rural to urban areas increased the inequalities in per capita income. There are different studies that emphasize the importance of pull and push effects on internal migrations in Turkey. Yamak and Yamak's study statistically inspected the relations between the rates of migration and per capita income in the period 1980-90 in 67 provinces of Turkey. Results of the study showed that the income inequalities played a major role on internal migration: this was caused by the higher income of in-migrated provinces rather than by the low income of out-migrating provinces. While approximately 25% of the migrants from out-migrating provinces to other provinces moved their house due to economic reasons, it was seen that 70% of the migrants to in-migrated provinces changed their places of residence because of economic reasons. This result shows that the pull effect is more dominant in internal migration movements in Turkey. Atalık and Çıracı (1993) obtained results that support the view that migration is caused by the push effects that stem from regional differentiation. The net changes in migration between 1980-85 is dealt with as a function of comparative attraction that depends on distance, per capita GNP, literacy, industrial workforce, size of population, density, and the population growth rate, and upon regression analysis, the most significant indicator was seen as per capita GNP.

Pazarlıoğlu (1997), in his study aimed at establishing the economic models of migration, took net migration speeds obtained by migration statistics that belong to the years 1980, 1985, and 1990 as dependent variables and employed GNP to represent the level of income of the provinces, used the levels of electricity consumption to express their wealth, employed education index, rate of unemployment, rate of agricultural workforce, per capita doctors, and terror and trend (time) data for the variable, human capital. Of the 7 models that were tested, 3 were found significant. The significant variables were: electricity consumption, unemployment and health for the first model; electricity consumption and education index for the second model; trend and electricity consumption for the third model.

Gedik (1996) tested the validity of the Lowry model, taking as a basis mainly three periods – 1965-70, 1975-80, and 1980-85 in Turkey, one of the developing countries of the world in terms of internal migration, external migration, pull and push effects, net migration and urban growth. As a result, findings were in the opposite direction of those of developed countries but it was seen that Turkey started to show a resemblance to developed countries in terms of the effects of migration for the period 1965-85, during which years a growth was realized.

İçduygu and Ünalan (1998), in their study "Internal migration in Turkey: problematic areas and research techniques", stated that internal migration which has had a profound impact on a

[1]The State Institute of Statistics defines internal migration as a change in the permanent residence of people who are five and above, between two censuses.

cause and effect basis on the formation of society in Turkey for the last 50 years did not have a comprehensive history which was written based on a reliable and valid database. They emphasized the deficiency, especially for the last 10-15 years, of the studies that may demonstrate all the dimensions, causes and effects, and dynamics of internal migration movements in Turkey. Related with the methodology of migration, Akşit (1998), in his study titled "Rapid Evaluation Methodology in Researches on Migration" discussed the merits and demerits of qualitative and quantitative research methods, and pointed to the necessity of employing them together in researches on migration. Özcan (1998) dealt with problems experienced related with the three sources of data such as censuses, survey applications and registers. It was stated that research appropriately conducted by the SIS (State Institute of Statistics) would be useful in the understanding of the causes, results and processes of migration. Ünalan (1998), Hoşgör (1998), Demirci and Sunar (1998) were concerned with data compilation and estimation problems in migration studies; Gedik (1998) stated the necessary work that should be done by the SIS, which provides data to studies on migration and advised on issues that should be taken care of during qualitative rehabilitation of data and data analyses.

2. Regional inequalities in Turkey

Theoretical approaches and applied studies show that there is a relationship between internal migration movements and regional inequalities or differences, and that each of them triggers each other. In this context, this part of the paper will deal with the regional structure of Turkey and regional imbalances of income to form a basis for eventual tests. Decreasing regional differences in Turkey has become one of the most important regional objectives from the 1960s on, although regional administrative units do not exist.

In the analysis, made taking as a basis the geographic regions, it is put forth that total regional inequality is increased by the developed regions which are located in the western part of the country in terms of both intra-regional and inter-regional imbalances in income (Gezici and Hewings, 2003; Gezici, 2004). On the other hand, when the relation between the location and economic performances of provinces is inspected, although western and southern coasts are formed by the most developed provinces, the provinces on the Black Sea coast are defined as underdeveloped due to high outmigrating rate and low rate of income.

Firstly, coastal provinces are located in the most prosperous and developed regions in the country due to their initial locational advantages and means of transport. However, the 5 provinces in the Black Sea Region, which are among the Priority Provinces in Development, are effective in the high levels of intraregional inequalities. In spite of this, the rate of intraregional inequality is 72% of the total inequalities in 1980 and was cut down to 66% in 1997. Theil index points to a fall in the intraregional differences in coastal regions and a rise in inland regions.

Table 1– Shares of intraregional and interregional imbalances in Turkey (Gezici and Hewings, 2003)

	Theil index	Geographic regions		Coast-Inland	
	Total	B.İ	B.A	B.İ	B.A
1980	0,1162	0,4527	0,5473	0,7158	0,2842
1981	0,1207	0,4707	0,5293	0,7347	0,2653
1982	0,1243	0,4330	0,5670	0,7245	0,2755
1983	0,1283	0,4320	0,5680	0,6965	0,3035
1984	0,1277	0,3966	0,6034	0,6950	0,3050
1985	0,1282	0,3928	0,6072	0,7127	0,2873
1986	0,1288	0,3929	0,6071	0,7135	0,2865
1987	0,1230	0,3860	0,6140	0,7097	0,2903
1988	0,1139	0,3769	0,6231	0,7043	0,2957
1989	0,1146	0,3638	0,6362	0,6515	0,3485
1990	0,1131	0,3917	0,6083	0,6936	0,3064
1991	0,1070	0,3777	0,6223	0,7104	0,2896
1992	0,1045	0,3674	0,6326	0,6850	0,3150
1993	0,1136	0,3775	0,6225	0,6977	0,3023
1994	0,1016	0,3866	0,6134	0,6941	0,3059
1995	0,1076	0,3632	0,6368	0,6822	0,3178
1996	0,1057	0,3413	0,6587	0,6617	0,3383
1997	0,1088	0,3388	0,6612	0,6605	0,3395

B.İ=Intraregional inequalities B.A= Interregional inequalities

The results of spatial data analysis by Gezici (2004) emphasizes the importance of spatial interaction between regions and of the geographic location in the regional economic performance. The effect of developed provinces/regions is again seen in the spatial development of the country. It is noted that developed provinces have positive effects on their vicinity, but tend to increase the regional inequalities in the entirety of the country. In light of these results, the evaluation of the effects of migration in regional equalities will contribute to the studies in this field. It is a known fact that economically developed provinces or regions attract migration for various reasons, but underdeveloped regions continue outmigrating; in other words pull-push effects are valid. In this study it is aimed to explain migration, which is seen in Turkish literature, especially as migration from the rural to the urban, with provinces and interregional migration, the levels of development and locational qualities of the provinces.

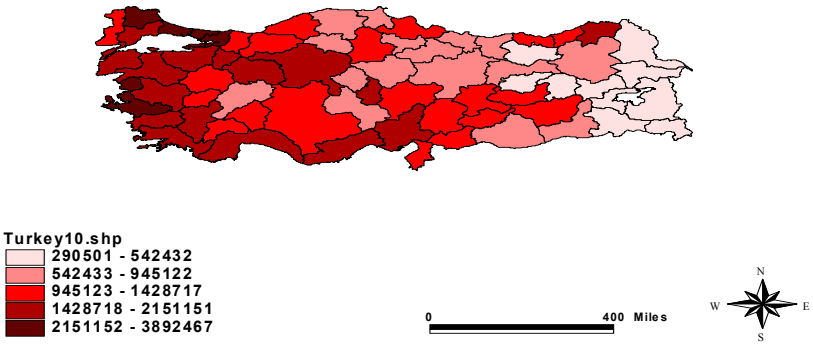

Figure 1. Distribution of per capita GNP to provinces in Turkey (1990)

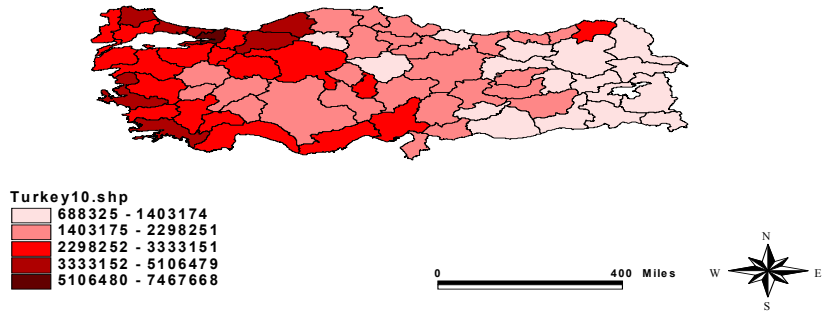

Figure 2. Distribution of per capita GNP to provinces in Turkey (2001)

Figure 3. Net Migration Rates of Provinces (1985-1990)

3. Methodology, Data and Hypotheses

The 73 provinces whose demographic and socio-economic data were accessible were inspected to study the interregional inequalities and interactions of internal migration movements in Turkey. Since the migration data of provinces for 2000 was inaccessible during the study, migration data from the SIS for 1985-1990 was employed. Assuming the migration movements of 1985-90 valid for the year 2000, a multi-regression analysis was made to primarily determine the effect of variables that express socio-economic development on migration. The variables which were tested for their relations with internal migration were chosen from among variables which were supposed to have both pull and push effect on migration. Accordingly, the relationship of the net migration rate, with the average increase in population between 1990 and 2000, with birthrate, with the increase in the number of high schools, with the number of doctors per 10,000 people, with per capita GNP, with per capita public investments, with the number of agricultural workers, with the number of industrial workers, with agricultural product value, with per capita industrial electricity consumption, and with geographic location was tested using the regression model. In the second phase, hypotheses were formed to test the effects of locational and socio-economic features of provinces in migration movements. A hypothesis test was performed using the Pearson correlation method, and the sample size is 73 (number of provinces).

Resting upon the findings brought about by regional income differences and socio-economic development studies, the following hypotheses were tested:

1. Located in the western part of the country is effective in in-migration.
2. Neighboring metropolises is effective in their in-migration.
3. Being a coastal province is effective in in-migration.

In addition to these locational hypotheses, the following hypotheses were tested:

1. That provinces which are among the top 10 in their socio-economic development level are effective in migration movements.
2. That other than the three major metropolises, the 5 centers of industry and tourism are areas of attraction for migration.
3. That provinces located in territories under strict control is a repellent factor.

4. Evaluation of Findings

The aim of this study is to inspect the interaction of interregional inequality and internal migration movements in Turkey. With this objective, one of the methods employed is a multi regression analysis which inspects the change in internal migration terms of demographic, economic, public services and locational features. The other employed method is the testing of the hypotheses that rest upon some locational and socio-economic features. In the model which had 73 samples, the dependent variable was the net migration rate realized between 1985 and 1990, and demographic, socio-economic and locational features such as the total population, estimated population growth between 1990-2000, the rate of literate people, the

number of high schools, the number of doctors per 10,000 people, public investments, GNP, the number of agricultural workers, the number of industrial workers, agricultural product value, industrial electricity consumption, and geographic location were included as independent variables (see Table 2). While all variables, except for geographic location, were used with their numerical value. The geographic location variable, which is included in the model as a dummy variable, was given the value of either 1 or 0 according to the province being in the west or east, respectively.

Multi regression analysis was made on the SPSS program with the stepwise method. In the model, t test was applied to test the significance controls of coefficients. The variables with an insignificant t value were the total population, birthrate, the rate of literate people, the number of high schools, the number of doctors per 10,000 people, public investments, the number of agricultural workers, agricultural product value, and industrial electricity consumption. Variables which were found significant and insignificant are shown in Table 2. As can be seen from Table 4, when the variables were inspected in terms of their t value, the estimated coefficients of each variable in the model were statistically significant, and when the F value is inspected it is seen that the estimated function is significant as a whole.

The variables that were determined to be significant in the model obtained upon multi regression analysis were: Industrial Workforce, Annual Estimated Population Growth, GNP, and Geographic Location (east-west). On the whole, it is seen that the most effective variable that determines the net migration rate is the GNP. According to coefficients of flexibility in Table 4, the GNP is followed by the variables of the industrial workforce rate, geographic location, and annual estimated population growth. An increase of one unit in each of these variables results in an increase of one unit in the net migration rate.

The results of the model that results from the multi regression analysis and the anticipated results are concordant. That especially income and job opportunities are the main causes of migration can be seen with these results, and the results support previous studies. The regression model puts forth the results that support the view that migration movements between provinces in Turkey change depending on their level of development and that being an area of attraction depends on the locational factor.

Table 3. Values of Regression Analysis

Model	R	R Square	Std. Error Estimate	Sum of Squares	Durbin Watson	df	Mean Square	F	Sig.
	,927(d)	,859	23,08119	221612,45	2,500	4	55403,113	103,996	,000(d)

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[2] The designating coefficient (R^2) is the rate of explanation of net migration speed by the independent variables. In this model, the rate of explanation by the independent variables is 0.85. In the estimated model the remaining part of 0.15 is formed due to unknown factors.

Table 2. Variables Employed in Multi Regression Analysis

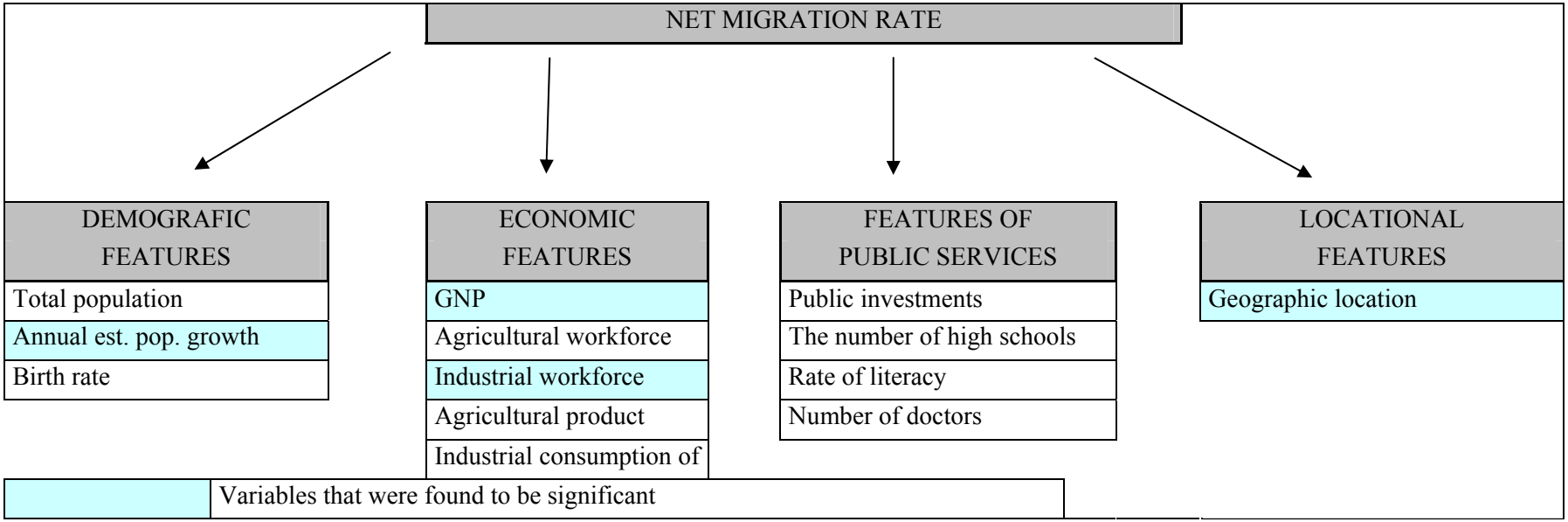

Table 4. Variables that were found to be significant in regression analysis

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	-1098,559	215,620		-5,095	,000
Industrial workforce	38,728	15,091	,218	2,566	,012
Annual estimated population growth	2,452	,224	,539	10,933	,000
GNP	108,752	24,607	,379	4,420	,000
Geographic location (East-West)	23,769	7,382	,190	3,220	,002

Following the results of the regression model, locational hypotheses and the effects of the levels of socioeconomic development, different economic activities and terrorism on migration were tested. The order of hypotheses here are according to their level of significance.

As the first hypothesis, the relation between the net migration rate realized between 1985 and 1990 in the 73 provinces of Turkey and *the geographic region the provinces are in* was inspected. The data for interregional inequalities in Turkey show the ongoing east-west dichotomy, and migration movements are assumed to support this dichotomy. Accordingly, Marmara, Aegean, and Mediterranean Regions in Turkey were accepted as western regions and Central Anatolia, Black Sea, East Anatolia, and Southwest Anatolia Regions were accepted as eastern regions. The west variable was given the value 1, and the east variable was given the value 0.

The results of the test made with the Pearson correlation method yielded r=666 in Table 5. As can be seen from the r value, there is a high-level directional relationship for provinces in Turkey between their net migration speed and geographic region. The locational advantages of provinces show the difference of east and west in internal migration.

As the second hypothesis, the relation between the net migration rate realized between 1985 and 1990 in the 73 provinces of Turkey and *their level of socioeconomic development* was inspected. Accordingly, the top 10 provinces in the list determined according to their level of development by the SPO for 2000 were accepted as the most developed provinces. While the most developed provinces were given the value 1, the provinces that come after the 10^{th} in the list were given the value 0.

The test gave the result r=567 in Table 5. As can be seen from the r value, there is a high-level directional relationship for provinces in Turkey between their net migration speed and their level of socio-economic development.

As the third hypothesis, the relation between the net migration rate realized between 1985 and 1990 in the 73 provinces of Turkey and *their being geographically located in coastal areas* was inspected. The results of interregional inequality analysis show a certain difference between coastal provinces and inland provinces. Although data from the provinces of the Black Sea negatively affect the data of coastal provinces, differentiation among coastal provinces lessens with time. Thus, provinces on the coasts of the Black Sea, Marmara, Aegean and Mediterranean Seas were accepted as coastal provinces. While the coastal provinces variable was given the value 1, provinces with no links with the sea received the value 0.

Test results gave the value r=4324 in Table 5. As can be understood from the r value, there is a directional relationship for provinces in Turkey between their net migration speed and their having a coast on the Black Sea, Marmara, Aegean, and Mediterranean Seas. Coastal provinces show the properties of a center of attraction, save the provinces of the Black Sea.

As the fourth hypothesis, the relation between the net migration rate realized between 1985 and 1990 in Turkey and *other than the three metropolises the 5 provinces (Bursa, Mersin, Adana, Antalya, and Muğla) which excelled in industry and tourism* was inspected. Thus the level of significance of these regions in becoming centers of migration due to their economic activities and job opportunities is shown.

Test results gave the value r=393 in Table 5. As can be seen from the r value, other than the 3 metropolises, the 5 provinces which are the centers of industry and tourism have a certain impact on the net migration speed of provinces in Turkey.

As the fifth hypothesis, the relation between the net migration rate realized between 1985 and 1990 in the 73 provinces of Turkey and *their being geographic neighborhood to Istanbul, İzmir, and Ankara,* which are the 3 provinces with the highest level of socio-economic development, was inspected. Accordingly, neighboring provinces to İstanbul, İzmir, and Ankara were accepted as provinces in the influential area and this variable was given the value 1. The variable for provinces which are not in the influential area was taken as 0.

The test gave the value r=294 in Table 5. As can be understood from the r value, although weak, there is a directional relationship between the net migration rate of provinces in Turkey and their being neighbors to Istanbul, Ankara, and Izmir.

As the sixth hypothesis, the relation between the net migration rate realized between 1985 and 1990 in the 73 provinces of Turkey and *their being located in territories under strict control* was inspected. Accordingly, the provinces under strict control were given the value 1, provinces which are not under strict control were given the value 0.

The test gave the value r=268 in Table 5. As can be seen from the r value, although weak, there is an adverse directional relation between the net migration rate of provinces in Turkey and their being located in territories under strict control. This result shows that terrorism had been effective on out-migrating in the movements of migration between 1985 and 1990. Nevertheless, economic factors were seen to be more effective on movements of migration than being located in territories under strict control.

The locational properties that display a significant relation also point to the areas of attraction for migration. In addition to these, terrorism is a repellent factor with a low but significant resulting variable. There is a high level of significance in that the dichotomy of east and west is a determining factor in movements of migration, too, as are the differences in regional income. A secondarily significant factor is the provinces which are listed among the top 10 with their levels of socio-economic development. A tertiary significant factor was the provinces' being located on the coasts. Testing of the fourth hypothesis showed that other than the three metropolises, the important centers of industry (Bursa, Adana, Mersin) and tourism (Antalya, Muğla) are attractive centers for migration, especially because of creating employment. These provinces' being coastal areas seem to support the previous hypothesis. Testing of the fifth hypothesis showed that provinces neighboring Istanbul, Ankara, and Izmir were also in-migrated, though not as much as expected. This result points to the fact that developed provinces and regions extend their economic performance to their vicinity and a secondary zone for migration has started to be formed around metropolises. It is the subject of another study whether these zones will be buffer zones that hold the migration towards metropolises at bay. Tests of all these hypotheses, as with many other studies on internal migration, show the relationship in terms of development and open the importance of geographic location in terms of migration and development.

Table 5. Test results of hypotheses

		Hypothesis 1 **Geographic Location**	Hypothesis 2 **Level of Socioeconomic development Top 10 provinces**	Hypothesis 3 **Provinces developed in terms of industry-tourism**	Hypothesis 4 **Coastal Provinces**	Hypothesis 5 **Neighboring developed provinces**	Hypothesis 6 **Terrorism**
Net Migration Speed	Pearson Correlation coefficient	,666(**)	,567(**)	,393(**)	,434(**)	,294(*)	-,268(*)
	Significance	,000	,000	,001	,000	,012	,022
	N- Number of Samples	73	73	73	73	73	73

5. Conclusion

The study, which inspected with the regression analysis method the effect of interregional inequality on internal migration in Turkey, proved that properties like income, workforce, growth of population, and geographic location were effective on movements of internal migration. The hypotheses which were put forth in the onset were for the most part proven. The interregional differences in Turkey in the level of development become more evident with the geographic location. These differences show the effect of geographical location together with the level of development on internal migration. The most important anticipation of this study from the future is to compare the data to be announced by SIS for 2000 with the data for 1985-1990, and to put forth the difference in movements of migration and to retest and discuss the hypotheses. The main subject of the study will be whether large metropolises continued being the most important destinations for migration, and whether they created new focal points for migration in their vicinity. Further, the study will be repeated with new data at the NUTS 2 level. At this level, holding at bay the out-migration from the provinces in the region especially at the center of these regions is among the regional development objectives that will be worked on. The most important contribution will be the concordance of the findings of this study with the findings of interregional inequality and its provision of guidance for regional development policies.

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Annex 1. Provinces which were evaluated in multi regression analysis and tests of hypotheses

Provinces		Hypothesis 1 Geographic Location	Hypothesis 2 Socioeconomic Development	Hypothesis 3 Industry Tourism	Hypothesis 4 Coastal Provinces	Hypothesis 5 Developed province neighborhood	Hypothesis 6 Terrorism
1	Adana	1	1	1	1	0	0
2	Adıyaman	0	0	0	0	0	1
3	Afyon	1	0	0	0	0	0
4	Ağrı	0	0	0	0	0	1
5	Amasya	0	0	0	0	0	0
6	Ankara	0	1	0	0	1	0
7	Antalya	1	1	1	1	0	0
8	Artvin	0	0	0	1	0	0
9	Aydın	1	0	0	1	1	0
10	Balıkesir	1	0	0	1	1	0
11	Bilecik	1	0	0	0	0	0
12	Bingöl	0	0	0	0	0	1
13	Bitlis	0	0	0	0	0	1
14	Bolu	1	0	0	0	1	0
15	Burdur	1	0	0	0	0	0
16	Bursa	1	1	1	1	0	0
17	Çanakkale	1	0	0	1	0	0
18	Çankırı	0	0	0	0	1	0
19	Çorum	0	0	0	0	0	0
20	Denizli	1	0	0	1	0	0
21	Diyarbakır	0	0	0	0	0	1
22	Edirne	1	0	0	0	0	0
23	Elazığ	0	0	0	0	0	1
24	Erzincan	0	0	0	0	0	1
25	Erzurum	0	0	0	0	0	0
26	Eskişehir	0	1	0	0	1	0
27	Gazinatep	1	0	0	0	0	0
28	Giresun	0	0	0	1	0	0
29	Gümüşhane	0	0	0	0	0	0
30	Hakkari	0	0	0	0	0	1
31	Hatay	1	0	0	1	0	0
32	Isparta	1	0	0	0	0	0
33	Içel	1	0	1	1	0	0
34	Istanbul	1	1	0	1	0	0
35	Izmir	1	1	0	1	0	0
36	Kars	0	0	0	0	0	0
37	Kastamonu	0	0	0	0	0	0
38	Kayseri	0	0	0	0	0	0
39	Kırklareli	0	0	0	0	1	0
40	Kırşehir	0	0	0	0	1	0
41	Kocaeli	1	1	0	1	1	0
42	Konya	0	0	0	0	1	0
43	Kütahya	0	0	0	0	0	0
44	Malatya	0	0	0	0	0	0
45	Manisa	1	0	0	1	1	0

Provinces		Hypothesis 1 Geographic Location	Hypothesis 2 Socioeconomic Development	Hypothesis 3 Industry Tourism	Hypothesis 4 Coastal Provinces	Hypothesis 5 Developed province neighborhood	Hypothesis 6 Terrorism
46	Maraş	1	0	0	0	0	0
47	Mardin	0	0	0	0	0	1
48	Muğla	1	0	1	1	0	0
49	Muş	0	0	0	0	0	1
50	Nevşehir	0	0	0	0	0	0
51	Niğde	0	0	0	0	0	0
53	Rize	0	0	0	1	0	0
54	Sakarya	1	0	0	0	0	0
55	Samsun	0	0	0	1	0	0
56	Siirt	0	0	0	0	0	0
57	Sinop	0	0	0	1	0	0
58	Sivas	0	0	0	0	0	0
59	Tekirdağ	1	1	0	1	1	0
60	Tokat	0	0	0	0	0	0
61	Trabzon	0	0	0	1	0	0
62	Tunceli	0	0	0	0	0	1
63	Urfa	0	0	0	0	0	0
64	Uşak	1	0	0	0	0	0
65	Van	0	0	0	0	0	0
66	Yozgat	0	0	0	0	0	0
67	zonguldak	0	0	0	1	0	0
68	Aksaray	0	0	0	0	1	0
69	Bayburt	0	0	0	0	0	0
70	Karaman	0	0	0	0	0	0
71	Kırıkkale	0	0	0	0	1	0
72	Batman	0	0	0	0	0	1
73	Şırnak	0	0	0	0	0	1

- Hypothesis 1: Geographic Location: provinces in the Marmara, Aegean and Mediterranean regions were deemed as Western provinces; and provinces in Central Anatolia, Black Sea, East Anatolia, and Southeast Anatolia are accepted as Eastern provinces.
- Hypothesis 2: Level of socioeconomic development: the top 10 provinces as ranked for their level of socioeconomic development by the State Planning Office for 2000 were compared with other provinces.

  * Although Yalova was the 10th province, it was omitted due to lack of relevant migration data.
- Hypothesis 3: A comparison was made between provinces developed in terms of industry and tourism, Bursa, Muğla, Adana, İçel, Antalya , and other provinces.
- Hypothesis 4: A comparison was made between provinces with and without a coast to Black Sea, Marmara, Aegean, and the Mediterranean.

- Hypothesis 5: A comparison was made between provinces geographically neighboring and non-neighboring provinces: Istanbul, Izmir, Ankara
- Hypothesis 6: A comparison was made between provinces that were among territories under strict control and those that were not.

Annex 3. Units of Dependent and Independent Variables used in Multi Regression Analysis

Independent Variables	**Unit**
Total Population	Number of people
Population Growth	Annual estimated increase in population (thousandth)
Birthrate	Number of children per house
GNP	Per capita Gross National Product (TL)
Agricultural workforce	The proportion of agricultural workers to total employment (%)
Industrial workforce	The proportion of industrial workers to total employment (%)
Agricultural product value	Share of agricultural product value in Turkey (%)
Manufacturing industry electricity consumption	Per capita consumption of manufacturing industry electricity consumption (Kwh)
Public investments	Per capita amount of public investments made between 1995 and 2000 (TL)
Rate of high school	Rate of high schools (%)
Rate of literacy	Rate of literate population (%)
Number of doctors	Number of doctors per ten thousand people
Geographic location	Shadow variable Marmara, Aegean, Mediterranean:1 Central Anatolia, E. Anatolia, SWAnatolia, Black Sea: 0
Dependent Variable	**Unit**
Net Migration Rate	Difference between in-migration and out-migration between 1985 and 1990 (thousandth)

Annex 4. Variables which were not found significant in multi regression analysis

Variables	Beta In	T	Sig.	Partial Correlation	Collinearity Statistics		
					Tolerance	VIF	Minimum Tolerance
Total population	.022(d)	.333	.740	.041	.476	2,102	,262
Birthrate	-,005(d)	-,065	,948	-,008	,401	2,494	,239
Proportion of agricultural workers to total employment %	-,045(d)	-,705	,483	-,086	,511	1,958	,258
Rate of high schools %	-,009(d)	-,158	,875	-,019	,586	1,708	,253
Number of doctors per 10000 people	,022(d)	,364	,717	,044	,555	1,801	,236
Industrial electricity consumption	,003(d)	,038	,970	,005	,268	3,726	,189
Agricultural product value per rural population	,025(d)	,484	,630	,059	,779	1,284	,259
Public investments	,025(d)	,474	,637	,058	,753	1,328	,239
Rate of literacy	-,046(d)	-,627	,533	-,076	,389	2,573	,249