

THE DETERMINANTS OF INTERNAL MIGRATION IN TURKEY

by

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Abstract

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Keywords: Migration, Internal, Turkey

Internal migration has had a great impact on Turkey's population dynamics for decades. According to the 2000 population census, nearly 28% percent of the population was born in a different province than the one that they now reside in. This ratio goes up to 62% for Istanbul, a major province that has drawn migrants for years.

The immense socioeconomic differences between regions shape migration. The dynamics of migration differ across regions as each region has its unique geographical and socioeconomic structure. However, previous studies suggest that despite these differences, there are common economic and social factors that affect internal migration in Turkey.

Gender differences also have an important role in determining internal migration patterns. Although education levels have increased significantly for females over the last decade, marriage and dependent migration still overwhelm other relevant factors such as job seeking. This shows that one needs to distinguish between the two genders when analyzing internal-migration.

Thus, this paper presents an empirical study on the determinants of internal migration in Turkey. Using data from the 1990 and 2000 population censuses, we present a descriptive analysis and estimate an extended gravity model of migration. We show that both economic factors such as income differentials and unemployment rates, and social factors such as presence of social networks along with personal characteristics such as age and education levels have a significant impact on migration. Moreover, following in part the approach of family migration models, we examine the effect of uncertainty on migration in our model.

Özet

TÜRKİYE'DE İÇ GÖÇÜN BELİRLEYİCİLERİ

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Ekonomi, MA Tezi, 2008

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Anahtar Kelimeler: İç Göç, Türkiye

İç göç Türkiye'nin nüfus dinamiklerine yıllardır etki etmektedir. 2000 yılındaki nüfus sayımına göre, nüfusun % 28'i doğduğundan farklı bir ilde ikâmet etmektedir. Bu oran yıllardır göçün odağı olan İstanbul için % 62 civarındadır.

Bölgeler arasındaki büyük sosyo-ekonomik farklılıklar göçü şekillendirir. Bölgeler arasında göç dinamikleri farklılık göstermektedir. Fakat önceki çalışmalar göstermektedir ki, bu farklılıklara rağmen Türkiye'de iç göçü etkileyen ortak ekonomik ve sosyal faktörler bulunmaktadır.

Cinsiyetler arasındaki farkların da iç göçü şekillendirmedeki rolü büyüktür. Kadınlarda eğitim seviyesi geçen on yılda artmış olsa da, evlilik ve aile ile beraber göç hala iş arama gibi diğer önemli göç sebeplerinin önünde gelmektedir. Bu, iç göç analizinde kadın ve erkeklerin ayrılması gerektiğinin bir göstergesidir.

Bu çalışma Türkiye'deki iç göç üzerine ampirik bir çalışmadır. 1990 ve 2000 yıllarına ait nüfus sayımından elde edilen verileri kullanarak iç göçü betimleyici bir analiz sunuyor ve iç göçün belirleyicilerini bulmak için yer çekimi modelleri tahmin ediyoruz. Gelir farklılıkları ve işsizlik oranları gibi ekonomik faktörlerin yanında, sosyal ağların varlığı, yaş ve eğitim seviyesi gibi özelliklerin de iç göç üzerinde anlamlı bir etkisi olduğunu gösteriyoruz. Ek olarak, aile göç modellerindeki yaklaşımdan yola çıkarak belirsizliğin göç üzerindeki etkisini inceliyoruz.

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Chapter 1

Introduction

Internal migration plays an important role in the workings of the labor market, acting as an equilibrating mechanism. Moreover, the welfare improving effects of migration as a result of a transfer of labor from low productive to high productive areas has also been previously demonstrated in the literature (Ghatak, 1991). However, recent research reveals that realizations from migration need not be always positive. Using data from the period 1963-1973, Tunali shows in his 2000 paper where he questions the rationality of migration, that returns from migration are negative for most migrants that moved within Turkey during that period. Both the migrants and the society as a whole face the consequences of these negative returns. As Lucas 1997 puts it:

Such issues as the efficiency of labor use and consequences of migration for overall poverty are of paramount importance, even beyond any considerations of pressures on infrastructure stemming from rapid urban growth (p. 727).

Reduction in the standards of living in urban areas that are the focus of incoming migrants is one of the more serious social burdens that comes about. According to Keles (1996), 35% of the Turkish urban population in 1995 were living in shantytowns most of which lack even the most fundamental infrastructure such as piped water and electricity. As Cole and Sanders (1985) point out, even individually rational migration decisions may have severe adverse effects on the society as opposed to what traditional theories of migration such as Harris and Todaro (1970) predict. For example, in Turkey for the years between 1987 and 1994, Özmucur and Silber (2002) show that internal migration from rural to urban areas increased the income inequalities rather than acting as an equilibrating mechanism and closing the gap. Thus, a careful empirical study of internal migration in Turkey may help

explain albeit high migration rates, why migration fails to act as an equilibrating mechanism across the country.

In a country such as Turkey where strong heterogeneity prevails in geographical, economic and social conditions throughout the country, internal migration becomes an important component that affects the population distribution and dynamics. According to the 2000 Population Census, out of the 6.7 million people that changed their residency in the previous 5 year period, 4.8 million migrated between provinces which corresponds to a 1.58% annual inter-provincial migration rate.¹ Although this rate might seem relatively low when compared to Spain for example where according to the 1991 Census, approximately 2.29% of the population move between provinces annually (Garca Coll and Puyol, 1997), the gross number of migrants is overwhelming compared to the populations of most developed European states such as The Netherlands(16,306,000), Belgium(10,446,000) and Sweden(9,011,000).

The fear of large-scale immigrations to Europe as a result of an expansion of the EU have been present since Portugal, Spain and Greece have applied for membership (Zimmerman, 1999). Now, although there is a level of distinction between internal and international movements, according to Bijak 2006, this difference becomes less and less relevant by the process of European integration. Thus, understanding the dynamics of internal migration in Turkey might prove to be helpful in predicting both the size and flow of potential migrations to Europe if Turkey were to be a part of the EU.

This study focuses on major economic and social causes of internal migration within Turkey. Relying on economic theories of migration (Sjaastad, 1962; Harris and Todaro, 1970; Levhari and Stark, 1982; Massey, 1990; Daveri and Faini, 1999), we attempt to determine the variables that affect gross migration across provinces. Using inter-provincial census data from 1990 and 2000 population censuses, we estimate a gravity equation of migration. Parallel to the recent empirical work on Turkey, (Gedik, 1997; Gezici and Keskin, 2005; Evcil et. al. 2006) we show that economic factors such as income differentials and job seeking, and the presence of social networks are significant determinants of inter provincial migration. Furthermore, we disaggregate our data to estimate the determinants of migration for the two genders separately. Our results indicate that there is a substantial difference between male and female migration decisions, which may be attributed to the idea that in Turkey migration is a family decision rather than an individual one.

¹Note considering return migration and step migration, the actual annual movement would be higher than this ratio.

Finally to examine how potential migrants behave under uncertainty, we attempt to incorporate direct measures of risk in our gravity model following in part Daveri and Faini's (1999) approach and show the impact of income correlations migration.

This paper is organized as follows: In the next section we review some strands of existing literature on migration followed by related empirical work on Turkey. The third section consists of a description of our dataset, followed by a descriptive analysis of the characteristics of migrants and the results from our estimations. The final section is reserved for conclusions and remarks.

Chapter 2

Literature

2.1 Economic Theories of Migration

Economic theory's contribution to migration research has rapidly increased since the 1960s. However, the classical theories of migration may be traced back to Ravenstein's 1885 paper on the laws of migration. The fundamental assumption of the classical approach is that the migrant is an individual that maximizes utility subject to a budget constraint (Bauer and Zimmerman, 1999). Labor migration arises due to the actual wage differentials between regions. If there is a labor shortage in a certain region, then the wages are said to be above the equilibrium wage levels. On the other hand regions with excess labor supply face wages lower than the equilibrium wages. Thus this actual difference in wages between regions causes labor to migrate and the larger the wage differential net of migration costs the larger the flow of migration. Migration ends as soon as the wage gap closes between the two regions and labor market equilibrium is attained.

Perhaps one of the most influential contributions to migration research is by Sjaastad (1962) which introduces the role of human capital to the migration decision. Sjaastad's model perceives the decision to migrate as an investment problem. In this framework, depending on their skill levels each potential migrant calculates the present discounted value of expected returns of their human capital in all potential regions and migrate if the returns from a potential destination region minus the costs (which include psychological as well as monetary costs) of migration is larger than the returns from staying at the location of origin (Zimmerman and Bauer, 2002).

Sjaastad's approach suggest that along with aggregate market variables such as wages, the characteristics and skills of individuals should also be considered when examining the determinants of migration, as large heterogeneity is bound to exist among migrants, which explains why people from the same region differ in their

propensity to migrate. One fundamental example of this heterogeneity is the age of the potential migrants. According to this framework, the likelihood of migration decreases with age as the lifetime gains for older migrants are relatively small when compared to young ones. Another one is the education level of an individual. This strand of theory predicts that migration increases with education levels, as higher education implies both higher returns through higher skills and reduced risks and costs due to better information collecting and processing. Further regarding the risks and costs of migration, risks and costs associated with migration are expected to increase with distance as moving to closer locations is financially less costly and collecting relevant and true information will be relatively difficult for distant locations which increase the risks associated with migration (Zimmerman and Bauer, 1999).

The seminal work of Harris and Todaro (1970), may be perceived as a combination of classical migration theories and the human-capital framework. In the model, which was mainly developed to explain rural to urban migration flows, migration essentially occurs due to earnings differentials, specifically in rural and urban sectors. Unlike the classical models however, for example the two sector model presented in Lewis, (1954) that assumes full employment, Harris and Todaro drop this assumption and introduce unemployment in the urban job market. Thus, compared to the migration decision in classical migration theories which are based on actual wage differentials, the migration decision in Todaro's model is based on the expected wage differentials that are introduced through the probability of finding a job in the urban sector. Hence, the most important variable in this model is the earnings weighted by the probability of finding employment in the destination region. According to the Harris-Todaro model, lower wage differentials between the two sectors imply lower migration rates, and higher probability of finding a job in the urban sector induces migration from rural to urban areas.

It is possible to link the Harris-Todaro model to the human capital framework as follows. Migration may be viewed as an investment in job search, for more attractive urban jobs (Lucas, 1997). The job search process in this model is based on the previous fact that urban-wages, which are the goal of rural migrants are exogenously determined and they are initially above equilibrium levels. The migration process relies on the urban employment possibilities, which risk neutral workers observe the employment probabilities openly in the form of unemployment rates. Migration stops when rural and urban labor markets are in equilibrium and there is no unemployment in the urban sector.

Although this model has been widely used to explain rural to urban migration

flows, both the model and its policy implications have received some criticism. First of all, the model cannot explain the migration of uneducated and unskilled labor, due to for example population pressure on a fixed land, which is quite common in developing countries. The equilibrium condition in the model, that there will be no further migration if rural and expected urban wages are equal has also been criticised in the literature. Lucas, 1997 points that comparing and defining equilibrium on rural and urban wage equality is very hard and may be incorrect due to such factors as skill differences and the difference in the costs of living in rural and urban areas. And the main policy implication of the model, the suggestion to develop the rural sector to reduce migration, may be more complex to implement. The main reason being, an initial attempt to improve the rural areas will provide some people the funds with which to migrate rather than creating an incentive to stay (Ghatak et al., 1996).

The approaches discussed up to this point with no doubt have set up the foundations of economic migration research. Although they have been both extended numerous times, their basic predictions such as the importance of income differentials, personal skills and employment probabilities are still fundamental in explaining migration.

Despite the fact that previous models form the backbone of migration research, and are still being used to explain migration flows, these models are static in terms of the effects of previous migration flows on the current period's decision. The network models of migration, on the other hand offer a dynamic approach to migration (Massey and España, 1987; Massey, 1990a, 1990b; Bauer and Gang, 1998). Migration in these models is dynamic in the sense that, both the monetary and social costs of migration may be lowered by the increased information from previous migrants. Simply, the first mover to a region faces high costs and risks due to the lack of reliable information. However, the migrants which are related to the first mover (family, friends even people living in the same region) that follow her will have both reduced costs and risks due to the forming of a network. On top of providing better information, the first mover may aid in the job search of a migrant, thus substantially increasing the probability of finding employment (Yap, 1977). Note that this positive effect of social networks is related to lack of complete information for potential migrants. In the previous two major models we considered, the presence of incomplete information was not emphasized. Precisely, in Sjaastad 1962, agents were considered to have full information on all alternatives and in the Harris and Todaro framework, while uncertainty is introduced through the chance of finding jobs, again agents have full information on both the unemployment rate and the

wages.

Equilibrium is attained in the network migration models following a reduction in the economic incentives of migration outweighing the positive network effects at a point, slowing and eventually stopping migration flows. In this framework when compared to the classical approach, economic benefits and costs are rather less important than the network effects. And they are harder to test since they offer a dynamic framework that every migrant affects both the social and economic structure in which the subsequent decisions are made (Zimmerman and Bauer 1999).

These models that essentially rely on the presence of asymmetric information, provide very important insight for internal migration in Turkey. Initially used to explain international migration flows, the presence of social networks is expected to have an important effect also on Turkish internal migration. This is due to large social and cultural differences between regions, and the existence of large families and strong ties among people living in close proximity, especially in rural areas.

All of the models presented up to here viewed the migration decision as an individual's choice. Mincer (1978) shifts the focus from an individual to the family as a decision-making unit. Thus, a tied movement idea has been developed. For example, family migration might have an aggregate positive return, although one partner experiences a drop in earnings, then the family migrates. On the other hand, the family does not move if family migration has an aggregate negative return, even if one partner would gain from migration. According to this approach, on one hand the costs of migration increase with the size of the household and on the other hand the benefits of migration increase with the number of income earning members of the household. Mincer (1978) goes to show that "family ties" reduces migration, increases the income and employment of husbands whereas it has just the opposite effect on wives.

Another approach on family migration, the New Economics of Migration literature that stems from Stark and Levhari (1982) considers the family's migration decision under the presence of uncertainty. According to this framework, parallel to the theory of investments in finance, the migration decision is a result of risk diversification of families (Chen et. al. 2003). Especially in rural areas of developing economies where formal credit or insurance markets are missing, families diversify the risks by spreading their assets (income earning members) to different locations. After migration takes place, the members of the family pool and share their income. Thus, in the presence of uncertainty and existence of imperfect correlations between potential locations, the migration decision of a member helps to diversify the risks of a family (Stark, 1991). Furthermore, according to this approach a high income vari-

ance at home is also an important determinant of migration. Therefore, high rates of migration without high wage and unemployment differentials may be attributed to uncertainty of income (Ghatak et. al. 1996). Perhaps a more interesting aspect of family migration is the relationship between marriage and migration. Marriage in developing economies, may be thought as a form of insurance especially for rural families (Rosenzweig and Stark, 1989). Placing family members may help diversify the income sources if there is a large variance between two locations, as in-laws are a major source of income especially in rural areas.

Compared to models where the individual is considered to be the decision maker, family migration models may be more appropriate for the Turkish case, as family is an integral part of the Turkish society. Moreover, considering the patriarchal social attitudes still prevailing in Turkey, family migration models may help explain the migration of unskilled females, both along with the family and for other motives such as marriage.

Before concluding this section, it is important to note the distinction between internal and international migration and the relationship between the theory related to these two types of movements. International migration involves crossing national borders and the additional costs and risks associated with the movement between countries. As well as the administrative barriers, these additional costs and risks involve various socio-cultural barriers and travelling greater distance in some cases. Although these factors imply a distinction between internal and international migration, theoretical contributions to one are relevant for the other (Cushing and Poot, 2004). The main reason for this is that the aim of most international migrants is essentially the same as the internal migrants, that is increase their utility levels net of costs through migration. A very good example on how international migration theories benefited from internal migration theories is how the micro approach in Sjaastad, 1962 developed to explain interstate flows in the U.S. was adapted and elaborated in important international migration theories such as Borjas, 1990. On the other hand Cushing and Poot, 2004 give an example on how internal migration research benefited from theories of international migration. The self-selection model presented by Roy, 1951 has been widely used to explain international migration flows (Borjas, 1987). The basic idea is that migrants self-select both in terms of their abilities and investments in human capital. This reasoning has been also been applied to internal migration again by Borjas et. al. 1992.

Another important example linking internal and international migration theories is a contribution by The New Economics of Migration literature, the issue of relative deprivation (Stark and Taylor, 1989; Stark and Taylor, 1991). The New

Economics of Migration argues that people migrate not only to improve their absolute incomes, but also their incomes relative to other households and reduce their relative deprivation. Thus, migration occurs in response to the dissatisfaction with respect to the relative position of the household's income in the reference community. This approach that was originally developed for international migration and how it should be interpreted for internal migration was later explained in Stark and Taylor, 1991. The main difference is that for the case of international migration, the reference community always stays as the community of origin as migrants move to a whole new society and they do not compare themselves with the native population. However as internal migrants move within a socially and culturally homogeneous society, a substitution is likely to occur after they migrate. Therefore although a clear distinction is present between the definitions of internal and international migration, theory related to these movements is linked and may easily benefit from one another.

2.2 Empirical Work on Turkey

One of the earliest empirical works on internal migration in Turkey that uses aggregate provincial data is by Munro, 1974. He initially discusses internal migration in Turkey from a human-capital perspective and aims to construct a full human-capital model of migration. However due to data limitations (lack of meaningful unemployment data and absence of age and occupational specifics etc), he constructs and estimates a push model of migration using inter-province census data from the 1965 population census. He defines the propensity to migrate as the ratio of the difference of total people born and people born still residing in the province over total people born in the province. Furthermore, Munro defines the propensity to migrate as a function of several push factors. Namely, percentage of people living in urban centers (as a proxy for urban unemployment), percentage of the literate population, nonagricultural value added per nonagricultural worker (as a proxy for nonagricultural earnings at the province of origin), percentage of cultivated land devoted to industrial crops and the radius of the province when converted to a circular shape, along with 6 regional dummy variables for the 7 geographic regions. He explains his selection of his independent variables as follows: Migration from a province depends on the conditions of the agricultural sector and nonagricultural employment opportunities and earnings. Moreover, education has also a role such that literacy both increases the chance for nonagricultural employment and creates an individual interest in change and improvement. The radius variable is used to measure the impact

of the area of a province and regional dummies account for regional differences not captured by other independent variables. In his estimation results, he finds parallel to expectations that all the explanatory variables are negatively correlated with the propensity to migrate except the percentage of literate population. Focusing on agricultural and nonagricultural earnings, this study is important in explaining rural to urban migration flows during the early stages of industrialization in Turkey. It shows that nonagricultural job opportunities at home and agricultural production geared towards industrialization creates an incentive for potential migrants to stay.

In one of the later works on internal migration, using Turkish provincial data from 1970, 1980 and 1985 population censuses, Gedik 1997 points at some conflicting findings in migration literature for developing countries. Gedik shows that, although it is generally claimed that in developing countries, push-factors such as low rural incomes, inadequate infrastructure, facilities, services etc. fuel out-migration, other factors such as education-skill and information level of the potential rural migrant; transportation and communication facilities and existence of previous migrants who are relatives, friends and people from the same village are as important as the push factors. Moreover she goes on to show that against expectations that rural to urban migration is the dominating pattern in developing countries, in Turkey urban to urban migration has surpassed rural to urban migration and furthermore, there is a substantial amount of urban to rural return migration. She also shows that a functional relationship with migration and distance cannot be obtained and that the effect of distance dies down after very short distances (around 40 km from the village to province center) and agents prefer to go to one of the three metropolises (Istanbul, Ankara, Izmir) regardless of distance. As a result of this observation, she claims that psychological distances seem to be more meaningful than the physical distances and if there relatives, friends and people from the same village have migrated are present at a distant location, then that location is preferred to a closer location. Gedik's study is important since, it points at the fact that rural to urban migration theories may be insufficient in explaining internal migration in Turkey for the period between 1970 and 1985. In our study, although as opposed to what Gedik, 1997 finds, we find a meaningful negative relationship with distance and internal migration, we also find evidence supporting the positive effects of education-skill levels and existence of social networks on migration.

In a more recent study, using a rich micro dataset for Turkey covering the 1963-1973 period, Tunali, 2001, examines the rationality of the migration decision of individuals in terms of income. He addresses the self-selection bias that may arise in the decision analysis with ex-ante and ex-post incomes. He uses a robust

selectivity correction method to overcome this problem and his findings support the rationality hypothesis: Both the movers and the ones that chose to stay, chose the option in which they had comparative advantage. However, he estimates that around three-fourths of migrants that moved within Turkey over the 1963-1973 period have realized a negative return, mostly around 10 to 20 percent. On the other hand, only a very small group has realized very high returns. One possible interpretation he suggests is that migration is a lottery, which offers high returns to a lucky few but the majority has to face some losses. The other possible explanation he offers is that some migrants have made a mistake and moved when they should not have.

Gezici and Keskin(2005) analyze the interaction between regional inequalities and internal migration in Turkey. Using data from the 1990 population census, through a simple least squares regression they find that the Share of the Industrial Workforce, Annual Estimated Population Growth, GNP to be significant determinants of the net migration rate. Furthermore, through the use of dummy variables, they test six additional hypotheses on net migration speed. They show that being located in a western region, the level of socioeconomic development of a province (as measured by the State Planning Organization), being located on a coastal area, being developed in terms of industry and tourism, and having developed provinces as neighbors have a positive impact on net migration speed, while terrorism has a negative effect.

In a related study, using 1990 and 2000 census data, Evcil, et. al. (2006) show that, even in the least developed regions of Turkey, urban to urban migration has taken the place of rural to urban migration and Marmara region differs from the other regions in terms of migration streams due to high urbanization, and presence of developed provinces such as Istanbul, Bursa and Kocaeli. Moreover, using stepwise regressions on 1990 and 2000 data, they point at economic factors such as differentials in the GNP, to be the most significant determinants of net migration rates among a set of economic and social variables including household size, share of financial, industrial and trading employees in total employed population, urbanization rate number of persons per physician, population density, the ratio of university graduates in 25 years or older population and ratio of literate population. Parallel to the findings of these two papers, we also find economic variables, especially income differentials to have a strong impact on internal migration in Turkey.

Chapter 3

Descriptive Statistics and Characteristics of Migrants

3.1 Data and Descriptive Statistics

3.1.1 Data and Geographical Scales

Empirical works on migration may be classified into two as relying on micro(individual) and macro(aggregate) data. Micro data generally rely on surveys of individuals and incorporate individual characteristics. The use of micro data has been steadily increasing in migration research as a result of both enhancements in computational power and improved data collection methods. However, the main problem with large micro data sets is their availability. Aggregate or macro data on the other hand has been more widely available through-out the world. Macro data may be in the form of cross-sectional or time-series and time-series data is generally used in international migration studies while cross-sectional data is generally used to examine internal migration (Zimmerman and Bauer, 1999).

This study is based on macro census data. Our principal sources of data are the population censuses of 1990 and 2000, supplied by the Turkish Statistical Institute (TURKSTAT). Both censuses cover the change over the previous 5 year period of the year they were conducted in, 1985-1990 and 1995-2000 consecutively. The data for the five year period in between, the 1990-1995 period, is not available as the frequency of population censuses have decreased from 5 to 10 years after the 1990 census. Our dataset consists of variables describing the social and economic characteristics of the whole population and migrants, as well as the size and flow migration. The census data used is spatially aggregated at province(il) level which corresponds to level 3 according to the Nomenclature of Territorial Units for Statis-

tics (NUTS)¹. Parallel with our data, throughout this study we define a migrant to be a person over the age of 4, who has changed her province of residence during five-years, between two consecutive population census days. Thus, our analysis is based on inter-provincial migration and does not cover intra-provincial movements. It is important to note here that the possibility of disaggregation is quite low in the data. For example we cannot disaggregate most of our variables into different age groups, which weakens our results as stating the determinants of migration for the adult population(independent population) is the main aim of this study.

3.1.2 Descriptive Statistics

The population of Turkey has increased from 56.5 million to around 68 million between 1990 and 2000 which corresponds to an annual growth rate of about 1.83%. This rate is the lowest recorded since the 1950s, as the increase in population growth has been declining especially since 1985, from 2.49% to 2.17% in 1990, 1.83% in 2000.

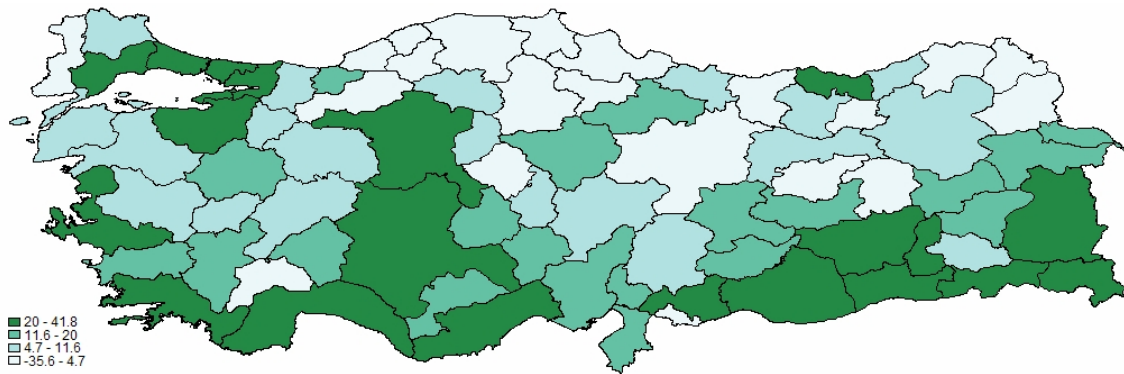


Figure 3.1: Population Growth Rates(Annual, ‰), Source: TURKSTAT (2000)

The latest figures may still be considered high when compared to European states such that according to the numbers from the OECD, apart from Spain and Ireland, Turkey still has the fastest population growth rates in Europe. These high population growth rates in Turkey may be attributed to high fertility rates and decreasing death rates. Although fertility rates have been falling steadily since 1970 from 3.41% to 2.53% in 2000, with increased availability of decent health care, the death rates and especially the infant and child mortality rates have been decreasing even more rapidly. While child mortality rate was 150‰ in 1970, it has decreased

¹For a detailed classification of statistical region units in Turkey we refer the reader to the Appendix

to 109‰ in 1985 and is as low as 43‰ according to the 2000 census of population. Moreover, although infant and child mortality rates are homogenous across regions fertility rates differ significantly across regions. For example while 16 out of provinces 24 provinces in Northeast, Centraleast and Southeast Anatolia have fertility rates above 3% and going as high as 7.06%, only 2 provinces out of the remaining 57 have fertility rates exceeding 3%.

Around 11% of Turkey’s population changed their place of residence between 1995 and 2000². Of the people that migrated between places of residence, 4.8 million have migrated between provinces, which makes up of 7.88% of the whole population and 71.54% of the migrant population (Table 3.1).

Period	Population	All Migration		Across Provinces	
		No. of Migrants	Percentage of Pop.	No. of Migrants	Percentage of Pop.
1975-1980	38,395,730	3,584,421	9.43%	2,700,977	7.03%
1980-1985	44,078,033	3,819,910	8.67%	2,885,873	6.55%
1985-1990	49,966,117	5,402,690	10.81%	4,065,173	8.13%
1995-2000	60,752,995	6,692,263	11.02%	4,768,193	7.88%

Table 3.1: Migration By Places of Residence, *Source: TURKSTAT (2000)*

Focusing on inter-provincial net migration , we observe that according to the 1990 census of population, out of the 73 provinces, 20 had positive net migration and in 2000, this number was 23 out of 81 provinces (Figure 3.2). Furthermore, looking at net migration rates from the two periods, we observe a similar distribution of migrants across provinces for both periods (Figure 3.3), where the difference between the eastern and western regions is clearly observed.

²Migration across the villages belonging to the same district, migration across the district centers and villages belonging to the same province is not covered.

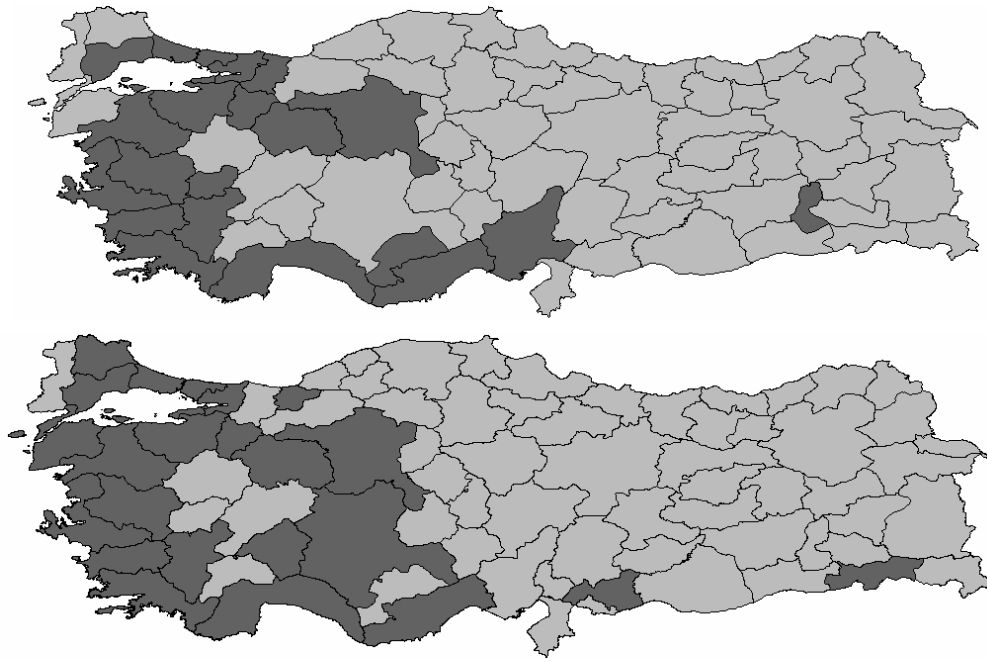


Figure 3.2: Positive(Dark fill) Versus Negative Net Migration,1990 & 2000, *Source: TURKSTAT (1990,2000)*

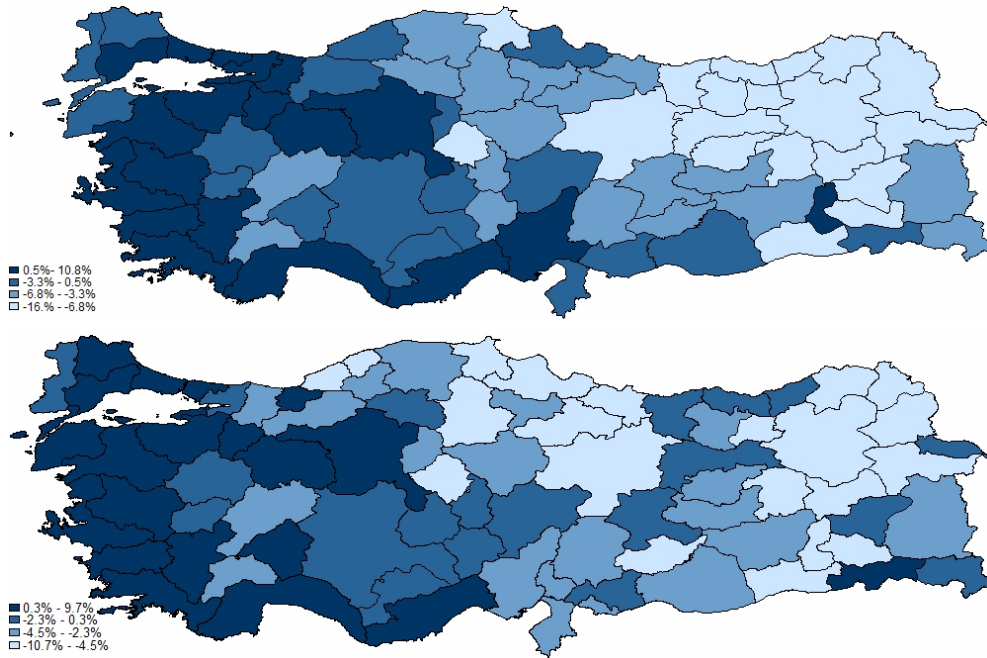


Figure 3.3: Net Migration Rates, 1990, 2000 *Source: TURKSTAT (1990, 2000)*

Spatially, starting from 1950s until 1970s increasing rural to urban migration has shaped the population distribution in Turkey, implying a population shift between villages and cities. Focus on industrialization as the dominant development in the 1950 strategy may be stated as the main reason behind the rural-urban migration(Munro, 1974). Specifically, slower agricultural growth, scarcity of new lands to cultivate, mechanization of agricultural production and improved road networks that connect rural areas with cities contributed to the increased flow of migrants from rural to urban areas(Tanfer, 1983). Especially large cities such as Istanbul, Ankara and Izmir that have been the main destinations of rural migrants have faced the negative effects of the high urbanization rates brought about by high rural to urban migration(Keles, 1996). In the later periods, rural to urban migration significantly slowed and urban to urban migration has increased remarkably to become the predominant migration pattern (Figure 3.4).

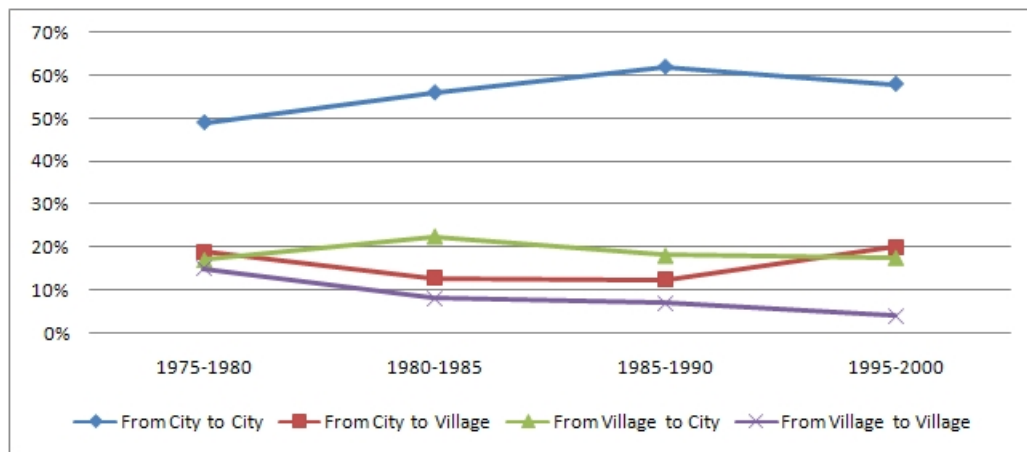


Figure 3.4: Proportion of Migrated Population By Places of Residence, Source: TURKSTAT (2000)

As a result, high urbanization rates brought about by rural to urban migration have also dropped in the recent years. During the 1965-1970 period, the urbanization rate was 6.03% and it has decreased to 4.67% in 2000. And moreover, the share of urban population (where urban refers to areas with population of 20,000 or more) has reached 64.9% in 2000. Thus, one may claim that rural to urban migration and the urbanization period has significantly slowed and spatially, rural to urban migration pattern has given way to urban to urban migration (Tekeli 1998).

3.2 Characteristics of Migrants

Both the characteristics of migrants and market variables play a significant role in the migration decision. We first give here a descriptive analysis of the characteristics of migrants. As an initial investigation, we look at the reasons for migration statistics that were introduced in the 2000 population census. Reasons for migration statistics are important as they help to distinguish between labor migrants and individuals moving for other reasons.³

In Turkey for the population 4 years and older, migration related to a member of the household seems to be the most important reason for migration as 26% of migrants move related to a household member. This is followed by job seeking with 20.31%, designation and appointment with 13.59% and education with 11.71%. However, when we analyze the two genders separately, we see a different picture. For male migrants, the most dominant reason is job seeking with 28.45% followed by migration related to a member of the household with 17.25% and designation and appointment with 16.58%. For females on the other hand, migration related to a family member and migration due to marriage together make up 53.24% of female migrants whereas job seeking females constitute only 9.94%.

³We have not covered involuntary migration in our analyses. There are different types of involuntary migration in Turkey, some can be identified through the data available and some cannot. The first type of involuntary movers are migrants moving due to designation or appointment, which accounts for 16% of male migration and 9.8% of female migration. Another important issue specific to the period we are concerned with is that the 2000 census of population was conducted approximately one year after the Marmara and Düzce earthquakes. Around 147,000 people were forced to move after the earthquakes. Istanbul received 13.1% of these migrants, followed by Ankara with 7.5%, Trabzon with 5.3% and Antalya with 4.6%.

The final topic regarding involuntary migration in Turkey is the issue of forced migration and depopulation. Political instabilities in the eastern and southeastern regions and fight between the Kurdish Worker's Party (PKK) and government forces, has caused out migration (including refugees) since late 1980s. What we observe from the reasons for migration statistics is that migration related to security only accounts for a very small percentage of internal migration even for regions that are at the center of the conflict. Also, forced evacuations of villages and depopulation in those regions by security forces have occurred quite often since 1986 (Hemmasi and Prorok, 2002). The number of people displaced vary immensely across different sources, however one of the latest and reliable estimates of internally displaced populations in Turkey reaches as high as one million (UNHCR, 1999). This issue however, is not emphasized in our study due to first the lack of reliable data and moreover, again with the data at hand, we cannot distinguish between political versus economic reasons of migration.

Male									
NUTS 1 Regions	Job Seeking	Appointment	Family Member	Educaion	Marriage	Earthquake	Security	Other	
Istanbul	18.54%	11.71%	15.44%	9.38%	1.46%	7.92%	0.68%	34.87%	
West Marmara	25.07%	21.75%	16.20%	14.48%	0.99%	0.31%	0.58%	20.62%	
Aegean	26.00%	17.08%	15.21%	16.88%	1.10%	0.44%	0.47%	22.82%	
East Marmara	18.79%	14.22%	14.01%	12.91%	0.90%	20.05%	0.39%	18.73%	
West Anatolia	21.20%	24.32%	15.74%	14.54%	0.85%	0.08%	0.38%	22.89%	
Mediterranean	28.75%	15.27%	16.30%	17.53%	0.77%	0.70%	0.52%	20.16%	
Central Anatolia	33.54%	16.93%	18.35%	13.78%	0.67%	0.05%	0.39%	16.29%	
West Black Sea	39.62%	13.50%	17.67%	12.20%	0.68%	0.17%	0.32%	15.84%	
East Black Sea	36.33%	14.25%	17.26%	14.59%	0.68%	0.10%	0.36%	16.42%	
Northeast Anatolia	33.79%	18.51%	21.44%	8.73%	0.39%	0.26%	1.03%	15.85%	
Centraleast Anatolia	30.44%	20.96%	19.90%	9.86%	0.38%	0.08%	2.26%	16.11%	
Southeast Anatolia	33.54%	16.19%	21.21%	8.60%	0.38%	0.09%	1.85%	18.13%	
Total	28.45%	16.58%	17.25%	12.84%	0.80%	2.77%	0.77%	20.54%	
Female									
NUTS 1 Regions	Job Seeking	Appointment	Family Member	Educaion	Marriage	Earthquake	Security	Other	
Istanbul	5.56%	5.87%	34.61%	8.55%	10.21%	10.38%	0.44%	24.38%	
West Marmara	11.36%	11.95%	35.28%	14.41%	15.25%	0.32%	0.13%	11.29%	
Aegean	10.22%	10.94%	34.32%	15.41%	15.11%	0.53%	0.19%	13.27%	
East Marmara	6.31%	7.77%	27.83%	9.90%	14.29%	22.92%	0.19%	10.77%	
West Anatolia	8.34%	15.62%	35.72%	10.94%	14.29%	0.11%	0.14%	14.83%	
Mediterranean	11.54%	9.25%	35.02%	15.32%	15.38%	0.88%	0.29%	12.32%	
Central Anatolia	8.44%	9.73%	39.15%	9.78%	22.49%	0.05%	0.17%	10.18%	
West Black Sea	12.07%	7.94%	38.41%	9.69%	21.06%	0.20%	0.14%	10.50%	
East Black Sea	10.36%	8.41%	35.59%	11.08%	23.65%	0.12%	0.17%	10.61%	
Northeast Anatolia	8.32%	11.12%	45.69%	5.12%	18.37%	0.31%	0.72%	10.36%	
Centraleast Anatolia	7.93%	12.84%	45.00%	6.19%	15.81%	0.11%	2.38%	9.74%	
Southeast Anatolia	17.33%	9.24%	44.84%	4.59%	12.42%	0.14%	1.72%	9.72%	
Total	9.94%	9.78%	37.15%	10.28%	16.09%	3.52%	0.52%	12.72%	

Table 3.2: Reasons For Migration, Source: TURKSTAT, (2000)

When we examine the characteristics of migrants in Turkey, we see that they are consistent with the ones presented in traditional views on migration which suggest that migrants are young, and well-educated individuals (Ghatak et. al., 1996). First, looking at the age structure of migrants, we see that migrants between the ages 15 and 29 make up of more than half of the migrant population. Compared to the whole population, for both periods, the "youngest" and "oldest" age groups constitute a significantly lower percentage of migrants, but on the other hand, the ratio of migrants aged between 15-29 (especially for the 20-24 age group) overwhelm the same ratio for the whole population.

Age Group	1990		2000	
	Population	Migrants	Population	Migrants
5-9	13.67%	11.84%	11.04%	8.21%
10-14	13.65%	10.76%	11.24%	7.60%
15-19	12.32%	13.20%	11.78%	14.08%
20-24	10.10%	15.88%	10.93%	22.86%
25-29	9.54%	16.72%	9.63%	15.83%
30-34	8.09%	10.03%	8.19%	9.24%
35-39	6.91%	6.66%	7.93%	6.61%
40-44	5.52%	4.37%	6.65%	4.60%
45-49	4.36%	2.94%	5.50%	3.48%
50-54	4.00%	2.18%	4.44%	2.49%
55-59	3.84%	1.86%	3.36%	1.58%
60-64	3.20%	1.44%	2.99%	1.17%
65+	4.79%	2.11%	6.31%	2.23%

Table 3.3: Age Structure, *Source: TURKSTAT (1990), (2000)*

The main difference between the two periods is the increase in the ratio of migrants aged between 20 and 24. In connection with this observation, if we look at the changes in the whole population versus the changes in the migrant population for the four age groups covering ages between 15 and 39, we may claim that the average age for a migrant is dropping.

Previous studies indicate that parallel to the human-capital framework, Turkish migrants had a higher educational attainment than the population from which they originate in the late 1960s (Tanfer, 1983). There is also statistical evidence to support that migrants on average have higher educational attainment than the general population for the periods we consider (Table 3.4). The share of illiterates in migrants is lower than the share of illiterates in the general population and share of the two highest levels of education in the literate population are above those of the general population. Moreover, the increase in these two ratios for migrants from 1990 to 2000 is more than the increase for the whole population. As in the population, there is a significant difference in education levels of male and female migrants

(Table 3.5). Although the majority of both male and female migrants are primary and junior high school graduates, females have a lower education level as both the ratio of female migrants who received higher education and high school education is lower than male migrants. A more striking figure regarding the differences between male and female educational attainment is the difference in illiteracy rates which is above 12% for all the three eastern regions, that are a major source of out-migrants.

Education Level	1990		2000	
	Population	Migrants	Population	Migrants
Illiterate	14.14%	11.78%	9.80%	6.49%
No Degree	17.45%	14.44%	23.00%	15.54%
Primary Sch., Junior High Sch.	64.43%	58.62%	50.96%	43.29%
High School	12.90%	17.17%	18.43%	27.32%
Higher Education	5.11%	9.73%	7.58%	13.84%

Table 3.4: Education Levels (Age 6+, Total) Source: TURKSTAT (1990), (2000)

Region	Illiterate		No Degree		Prim., Jr. High Sch.		High Sch.		Higher Education	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
<i>Istanbul</i>	2.30%	9.86%	12.69%	19.35%	47.02%	47.98%	26.72%	23.03%	13.57%	9.63%
<i>West Marmara</i>	1.84%	5.10%	11.48%	13.63%	34.81%	41.78%	35.80%	29.46%	17.91%	15.12%
<i>Aegean</i>	1.84%	6.62%	10.88%	14.47%	38.94%	41.38%	32.52%	28.43%	17.66%	15.70%
<i>East Marmara</i>	1.94%	6.44%	13.79%	16.72%	37.11%	45.39%	31.42%	25.07%	17.67%	12.80%
<i>West Anatolia</i>	1.36%	5.34%	10.26%	13.82%	29.60%	36.31%	33.09%	25.88%	27.05%	23.97%
<i>Mediterranean</i>	2.84%	9.57%	12.39%	16.94%	39.85%	42.31%	34.25%	29.60%	13.50%	11.14%
<i>Central Anatolia</i>	2.16%	8.62%	13.37%	16.80%	42.65%	52.12%	30.29%	21.51%	13.68%	9.55%
<i>West Black Sea</i>	2.31%	8.33%	12.35%	15.77%	48.17%	55.11%	27.91%	20.07%	11.57%	9.03%
<i>East Black Sea</i>	1.79%	8.52%	12.22%	16.31%	43.25%	51.26%	31.21%	23.11%	13.31%	9.29%
<i>Northeast Anatolia</i>	4.54%	16.31%	17.11%	23.47%	45.18%	51.15%	24.79%	15.91%	12.91%	9.45%
<i>Centraleast Anatolia</i>	5.15%	18.13%	17.26%	25.15%	40.77%	45.26%	28.16%	19.83%	13.80%	9.75%
<i>Southeast Anatolia</i>	8.90%	26.69%	20.21%	31.42%	44.65%	45.44%	25.04%	16.15%	10.11%	6.96%
<i>TOTAL</i>	3.18%	10.72%	13.60%	18.23%	41.30%	46.06%	29.98%	23.63%	15.12%	12.07%

Table 3.5: Education Levels (Age 6+, Out-Migrants) Source: TURKSTAT, (2000)

Employment has been a key issue in migration research since Harris and Todaro(1970). Pissarides and Wadsworth (1989) show that being unemployed make it more likely for an individual to move. The unemployment rates of Turkish migrants, with 6.71% and 9.44% for the two periods considered consecutively, are about one percent higher than the general population. Although the increase in unemploment rates are parallel to that of the population, there is a great difference in the increase of unemployment rates among male and females. While in 1990 for female migrants, the unemployment rate was lower than males, in 2000 the unemploment rate for females more than doubled to surpass the unemployment rate for males. It is also important to note here that labor force participation rates differs significantly among the two genders with 79.3% for males and 29% for females for the whole popualation, and 76.3%, 34.5% for male and female migrants respectively in 2000. One other important note about labor participation rates is that looking at the labor participation rate for women in 1990, which is around 34%,the labor participation rates are falling for women.

Male				
Employment Status	1990		2000	
	Population	Migrants	Population	Migrants
Regular/Casual Employee	50.10%	80.19%	54.47%	85.01%
Employer	1.96%	1.74%	3.58%	1.72%
Self Employed	30.66%	13.39%	28.15%	8.63%
Unpaid Family Worker	17.26%	4.66%	13.78%	4.64%
Female				
Employment Status	1990		2000	
	Population	Migrants	Population	Migrants
Regular/Casual Employee	17.71%	60.36%	24.28%	61.33%
Employer	0.23%	0.46%	0.90%	0.82%
Self Employed	7.29%	6.57%	5.98%	3.26%
Unpaid Family Worker	74.77%	32.60%	68.84%	34.59%

Table 3.6: Employment Status(Age 12+), *Source: TURKSTAT (1990), (2000)*

Table 3.6 sheds light to the employment status of migrants. First, notice that among the employed people, there are significantly more regular or casual employees and less unpaid family workers in migrants compared to the whole population in both periods. This is in support of the hypothesis that income differentials are a strong motivation for migrants. However, again we need to differentiate between the two genders. As in 2000 for example, while only 4.64% of employed male migrants were unpaid family workers, 34.59% of females had this status. This might suggest as evidence supporting the hypothesis that males rather than females are the main income seekers in Turkey. Differentiating between genders is also crucial when we

consider the economic activities of migrants.

Male				
Economic Activity	1990		2000	
	Population	Migrants	Population	Migrants
Agriculture	37.72%	10.72%	32.86%	10.38%
Mining	0.86%	0.97%	0.56%	0.54%
Manufacturing Ind	14.84%	17.59%	16.01%	14.03%
Electricity, Gas, Water	0.50%	0.53%	0.54%	0.49%
Construction	7.84%	14.68%	7.10%	10.17%
Trade, Restaurants, Hotels	11.46%	12.59%	13.08%	11.00%
Transport, Communication, Storage	4.92%	4.98%	4.77%	3.27%
Financial and Related	2.59%	3.92%	3.28%	3.81%
Community, Social, Personal Services	18.47%	32.42%	21.62%	46.31%
Female				
Economic Activity	1990		2000	
	Population	Migrants	Population	Migrants
Agriculture	82.07%	43.03%	75.64%	42.09%
Mining	0.02%	0.06%	0.03%	0.04%
Manufacturing Ind.	6.66%	12.81%	6.62%	11.14%
Electricity, Gas, Water	0.07%	0.18%	0.09%	0.13%
Construction	0.13%	0.47%	0.21%	0.31%
Trade, Restaurants, Hotels	1.64%	3.81%	3.66%	5.71%
Transport, Communication, Storage	0.46%	1.48%	0.67%	1.22%
Financial and Related	1.83%	4.96%	2.80%	5.07%
Community, Social, Personal Services	6.88%	32.32%	10.23%	34.28%

Table 3.7: Economic Activity(Age 12+), *Source: TURKSTAT (1990), (2000)*

Table 3.7 shows that a significant part of the population is involved with agriculture, especially considering females. However for migrants this portion is relatively small, while all other economic activities constitute a higher portion of the migrant population. This may support the hypothesis that rural to urban movement of people involved with agriculture is slowing and giving way to another migration pattern. Male migrants concentrate on community, social and personal services, trade, manufacturing, agriculture and construction. While female migrants concentrate on agriculture, social and personal services, manufacturing followed by trade related activities (Table 3.7). The economic activity statistics show different skills that migrants possess. This, especially in the context of rural to urban migration, is strongly related to transferability of skills that a migrant obtained before migrating. The migrants that were involved with agriculture prior to migration, will not be able to use their skills in the urban job market, in particular in the formal sector, after migration. Which in turn will lead to increased unemployment, and growth in the informal job sector.

Chapter 4

Econometric Estimations And Results

4.1 A Gravity Approach To Internal Migration In Turkey

In this section, in light of the existing economic theories of migration and the descriptive analyses in the previous section, we define and estimate a gravity model of migration.

As stated in the preceding chapter, empirical works on migration may be classified into two as relying on individual and aggregate data. In connection with this, estimated migration equations may also be classified as macro and micro depending on the type of data used. As our data at hand is aggregate, we focus on macro migration equations.

A widely used form that belongs to the family of macro migration equations is the gravity formulation. As the name suggests, the gravity model of migration is essentially conceived from Newton's law of gravity. Newton's "Law of Universal Gravitation" defines the attraction between two objects as a function of the product of their masses divided by the square of the distance between them, multiplied by a gravitational constant. Using the same reasoning, the gravity model has been widely used in economics especially by trade theorists, starting with Tinbergen, 1962. According to the simplest form of the gravity model of trade, total trade between two countries is a positive function of products of their incomes, which serve as the attractive force between the two nations and a negative function of the distance between the two countries.

Similarly, the gravity model of migration that has been used in modelling

both internal(Lowry, 1966; Alonso, 1978) and international(Karemera et. al. 2000) migration flows defines migration flows to be a function of origin and destination specific repulsive and attractive factors combined multiplicatively with some form of distance deterrence function. The basic form of the gravity model may be written as:

$$M_{ij} = A_i B_j f(D_{ij}) \quad (4.1)$$

The subscripts i, j denote the areas of origin and destination respectively, M_{ij} is the number of migrants that have moved from i to j , D is the distance between i and j which affect migration flows in some monotonic inverse function $f(\cdot)$, and A_i and B_j are origin and destination specific push and pull factors (Molho, 1986).

The most attractive feature of the gravity model is its generality. Although the gravity model has no particular theoretical foundation, it presents a general framework which makes it possible to test a significant number of the ideas presented by migration theories empirically. Though a gravity model can be formulated to reflect many features stated by different strands of the theory, the main argument against the gravity model is that the aggregation in the model may fail to incorporate the heterogeneity present in the population. As migration is the decision of an individual, macro variables that are used as proxies of individual attributes may lead to biased results as aggregate values only give mean values of these attributes, which is a common fallacy of macro migration models.

The gravity model may be derived through a system of demand and supply equations(Zimmerman and Bauer, 1999; Karemera et. al. 2000):

$$M_{ij} = f(S_i, D_j, C_{ij}) \quad (4.2)$$

The migration flow M_{ij} from the origin province i to the destination province j is a function of supply-push factors at home S_i , demand-pull factors in the destination D_j and the costs associated with moving from i to j , C_{ij} , which takes place of the distance deterrence function presented in the basic gravity model.

The fundamental supply and demand functions for migrants and the migration function may be defined as follows (Karemera et. at., 2000):

$$S_i = b_0 y_i^{b_1} n_i^{b_2} \quad (4.3)$$

$$D_j = c_0 y_j^{c_1} n_j^{c_2} \quad (4.4)$$

$$M_{ij} = \frac{a_0 S_i^{a_1} D_j^{a_2}}{C_{ij}^{a_3}} \quad (4.5)$$

Substituting Equations 4 and 5 in Equation 6 we get:

$$M_{ij} = \frac{d_0 y_i^{d_1} n_i^{d_2} y_j^{d_3} n_j^{d_4}}{C_{ij}^{a_3}} \quad (4.6)$$

Where $y_i(y_j)$ is the income in the province of origin(destination) and $n_i(n_j)$ is the size of the population of the province of origin(destination). and C_{ij} in Equation 6 represents the costs associated with moving from i to j . The exponents in the equations are the migration elasticities. The multiplicative nature of the model allows for linearizing through taking natural logarithms. Thus, taking logs on both sides the double log base model to be estimated becomes:

$$\ln M_{ij} = \beta_0 + \beta_1 \ln POP_j + \beta_2 \ln POP_i + \beta_3 \ln INC_j + \beta_4 \ln INC_i + \beta_5 \ln DIST_{ij} + z(.) \quad (4.7)$$

Our dependent variable m_{ij} is the gross migration flow between the province of origin i and destination j with $i \neq j$.¹ We have used gross rather than net migration flows since if in and out migration flows are correlated, net migration cannot separate the push and pull factors responsible for the gross migration flow in both directions (Zimmerman and Bauer, 1999).

We control for the populations of the origin (POP_i) and destination (POP_j) in our regressions. Along with distance, the population variables may be stated as standard gravity variables in the equation and both population variables are expected to have a positive effect on migration (Etzo, 2008). Real Gross Domestic Products at the province of origin and destination are used as our income variables INC_i and INC_j . We expect that lower income at the province of origin would push people out to provinces with higher income. Since the earliest theoretical works on migration income differentials have been suggested as a major determinant of migration (Sjaastad, 1962; Harris and Todaro 1970). Moreover, recent empirical studies on Turkish internal migration also point at the importance of income differentials in Turkish internal migration (Tunali, 2001; Gezici and Keskin 2005; Evcil et. al. 2005).

$DIST_{ij}$ is the distance between two provinces measured by the length of the roads in kilometers between two provinces. Distance is used as a proxy for the costs

¹Ideally we would have liked to disaggregate this variable to only focus on the adult (independent) population. However as this is not possible, this variable included all migrants above the age of four.

associated with moving from province i to province j as it is common practice in the literature (Greenwood and Hunt, 2003; Cushing and Poot, 2004). An increase in the distance between two provinces is expected to discourage migration from province i to province j , as increased distance would imply both increased physical and psychological costs associated with moving.

$z(\cdot)$ is a function that includes all the economic and social attributes of the sending and receiving provinces apart from those defined in our supply and demand equations (Schultz, 1982). After identifying the elements of $z(\cdot)$ our extended gravity equation that we estimate becomes:

$$\begin{aligned} \ln M_{ij} = & \beta_0 + \beta_1 \ln POP_j + \beta_2 \ln POP_i + \beta_3 \ln INC_j + \beta_4 \ln INC_i + \beta_5 \ln DIST_{ij} \\ & + \beta_6 U_j + \beta_7 U_i + \beta_8 YNG_i + \beta_9 SCH_i + \beta_{10} NW_{ij} + \beta_{11} REG + \beta_{12} IST \end{aligned} \quad (4.8)$$

U_i and U_j are the unemployment rates of the origin and destination provinces respectively. Since Harris and Todaro (1970), employment opportunities have theoretically been shown to have an impact on migration and although it is common practice to include unemployment rates to introduce employment opportunities in migration models in a simple manner, some conflicting empirical results regarding unemployment rates and migration are present in the literature. Opposite of what the theory predicts, some studies find that the correlation between migration flows and unemployment are positive (Fields, 1979; Pissarides and McMaster, 1990). Fields, 1976 attributes this ambiguity to mainly to the use of aggregate data and the fact that general unemployment rates belong to "the entire stock of workers". Keeping this in mind, in line with the theory, we expect that a rise in the unemployment rates of the province of origin will accelerate out-migration from that province and a rise in the unemployment rate of the province of origin will deter migration to that province.

We also controlled for the ratio of the young people and the education level in our equation, which are stated as important determinants of migration according to the human capital framework. YNG_i represents the share of young people in the population. Namely, it is the ratio of persons aged between 12 and 25 to the whole population in the sending province, which is expected to be positively correlated with migration. According to the human capital framework, as younger agents have a longer life expectancy, the present value of income differences is greater thus a higher rate of migration is expected as the ratio of young people increase in a province. However, Lucas 1997 points at a slightly different pattern regarding age

and migration based on the Rogers-Castro curve. According to the Rogers-Castro curve, the peak of migration occurs in early adult years and falls sharply after mid-twenties, a fact contradicting with the human capital framework. SCH_i is our human capital variable, which is proxied by the average years of schooling in the province of origin, again consistent with the human capital framework, we expect average years of schooling to have a positive effect on migration. It is important to note here that, Zimmerman and Bauer, 1999 point that the results about the coefficients of these variables should be approached with caution. As schooling and age variables used here are proxies for individual characteristics, the use of aggregate data may "mask" some features of the individual migration decision as defined by the human-capital framework.

One of the key variables in our regression is NW_{ij} the stock of people that have migrated from province i to j prior to the period of question. This variable measures the impact of social networks on internal migration and is a proxy for existing social networks between potential migrants and the people that have moved in the previous periods. Lucas, 1983 p. 743 states that:

A substantial amount of evidence indicates an empirical regularity: persons having access to kinship and other networks at a place of destination are more likely to choose that place.

The presence of networks may effect potential migrants from several angles. First, presence of networks greatly reduces psychological costs associated with migration and financial costs associated with resettling. Furthermore strong network ties also enhance information available to migrants, which both plays a role in the migration decision and substantially speeds up the job search process especially in the informal sector (Lucas, 1997). Karpat, 1976 reports that, the presence of social networks and reliance on friends and relatives from a migrants origin is responsible for so many residents in squatter settlements in Ankara being from the same village or region of Turkey, as a majority of rural migrants interviewed for his study reported knowing someone at the destination ahead of their move. Therefore, not only do we expect that the coefficient of NW_{ij} to be positive, considering the strong family and local ties in Turkey, we expect the magnitude of this coefficient to be high in particular. Note that The problem with this variable is the fact that a large stock of people from the the same province of origin living in a province, does not necessarily imply that a potential migrant will have social ties with these people. However, it is clear that the presence more people from the same province of origin increases the likelihood of finding a social network for a potential migrant.

REG and *IST* are dummy variables that capture within region migration and migration to Istanbul respectively. We expect both of these geographic dummy variables to have a positive effect on migration. The interesting question here would be the difference between the two periods in question for these two variables especially for the *IST* dummy since although Istanbul has been the main destination for migrants for several decades, it would be interesting to see if this bias is starting to die down.

Because our data is restricted only to two consecutive periods, we pooled the data to estimate both the base model and our extended gravity model. Using a year dummy (Y_{2000}) for 2000 and the interactions with this year dummy, we present the coefficients for the year 1990 and the change in these coefficients for the year 2000. The results are presented in the table below. The first two columns contain the results of our base model estimations and the last two columns are from the estimation of the extended model. The variables in the first column are the estimation results for the year 1990 and the variables in the second column represent the change in these variables for the year 2000. Since migration affects the economic conditions in the sending and receiving regions the data used in our estimations are drawn from the previous years of question, the base years of migration (Fields, 1979). Thus to estimate gross migration flows for the year that occurred between 1985 and 1990, we used the data from the 1985 census. As previously mentioned, the frequency of population censuses has decreased from 5 to 10 years in 1990 as a result, although the gross migration flows from the 2000 census cover the years 1995-2000, we had to take 1990 as our base year for the migration flow and used data from the 1990 census. Working with data from previous periods causes a difference in the number of observations since the number of provinces have increased from 67 to 73 from 1985 to 1990 and from 73 to 81 between 1990 and 2000². To tackle this problem, rather than dropping the new provinces, we assigned the new provinces the data from the provinces they were separated from.

Looking first at the results for the base model, all the variables have the expected signs and are significant at 1% level for the first period. The model explains 64% of the variation in gross migration. Apart from the negative change in the migration elasticity of distance, change in all the variables in the second period are significant. The change in both of our income variables are not only significant but also are such that they show the impact of income on migration has been lowered for 2000.

Moving to our extended gravity model, all the estimated coefficients are sta-

²We refer the reader to the Appendix for the list of new provinces

Base Model			Extended Model		
Variable	1990	$\Delta 2000$	Variable	1990	$\Delta 2000$
POP_j	0.719*** (0.0295)	0.153*** (0.0341)	POP_j	0.652*** (0.0274)	0.177*** (0.0322)
POP_i	1.067*** (0.0295)	-0.140*** (0.0335)	POP_i	1.073*** (0.0334)	-0.187*** (0.0371)
INC_j	0.157*** (0.0199)	-0.0614*** (0.0230)	INC_j	0.155*** (0.0182)	-0.0616*** (0.0211)
INC_i	-0.168*** (0.0218)	0.140*** (0.0244)	INC_i	-0.327*** (0.0309)	0.294*** (0.0337)
$DIST_{ij}$	-0.468*** (0.0252)	-0.0419 (0.0308)	$DIST_{ij}$	-0.295*** (0.0279)	-0.0557* (0.0333)
Y2000		-0.879* (0.513)	U_j	-5.149*** (0.796)	-1.784** (0.888)
		Observations: 11736 R^2 : 0.631	U_i	3.125*** (0.900)	-1.315 (0.998)
			YNG_i	4.042*** (0.857)	0.901 (1.049)
			SCH_i	0.0780*** (0.0294)	-0.111*** (0.0333)
			NW_{ij}	1.37*** (0.197)	0.649* (0.370)
			REG	0.763*** (0.0613)	-0.157** (0.0724)
			IST	1.826*** (0.131)	-2.169*** (0.193)
			Y2000		-2.056*** (0.567)
					Observations: 11736 R^2 : 0.684

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.1: Regression Results (Total)

tistically significant at 1% level and have the expected signs. The extended model explains the variation around 5% better. Looking at changes in the variables for 2000, we observe that except for the age variable and the unemployment rate of the province of origin, all variables have significantly changed in 2000. Starting with our population variables, while the positive effect of the population of the receiving province seems to have increased, the effect of the population of the province of origin has decreased. Both the positive effect of income in the destination province and the negative impact of income in the province of origin have become significantly less effective. On the other hand the negative effect of the unemployment rate of the destination province has increased. The positive impact of our network effect variable has increased however this change is significant only at the 10% level. The effect of both Istanbul and regional dummies have significantly decreased pointing that migrants are considering a wider set of alternative locations besides Istanbul and close within region provinces. In comparing the base and extended gravity models, it is also important that only the negative impact of distance on migration drastically decreases when we extend our equation, while the coefficients of popula-

tion and income variables are more or less the same in both variables. This shows that, the negative effect of costs of migrating decrease with our additional variables such as schooling and the network effects variable as the theory predicts.

4.2 Gender and Migration

In light of the descriptive statistics presented in the previous chapter, we would expect both that the role that different genders play in the migration decision and the motivations behind migration for the two genders will not be uniform in Turkey. According to Tanfer (1983) the developing world (with some exceptions) exhibits two main patterns of migration regarding females. The first one is the female dominant migration which is mainly observed in Latin America, and the Afro-Asian pattern that historically has clearly been dominated by men. Tanfer (1983) goes on to point that, internal migration in Turkey with exceptions, falls into the second category. The patriarchal social attitudes prevailing in the society refrain women from reaching their full potential. Women are still restricted from traveling or migrating alone. Therefore, as mentioned before migration from rural-small towns is often a family affair that includes women. This family affair may occur with an occasional time lag as we have seen in the previous chapters. The head of the family might migrate first, find accommodation, get a job, form a network etc. then his spouse and children follow him.

Looking at the marriage statistics for the year 2000, we observe that a smaller portion (47.7%) of migrant men are married compared to the whole population (59.5%). On the other hand, the portion of married migrant women are slightly more (62.9%) than the whole population (61.3%). Note here that these ratios are based on the post-migration status, thus women who moved between provinces with the purpose of marrying are also counted as married. Employment of these married women is another important subject as most women especially in rural areas are low skilled agricultural workers. So even if their fathers or husbands allow them to work for wages after migration, it is very hard for them to transfer their skills to urban areas and get a job in the formal sector.

Although most female migration involve family units, an increasing proportion of women migrate unaccompanied by related men. They constitute a smaller population of female migrants composed of educated professionals who are urban born, and searching for better employment in other cities (Which may be defined to include women that move to large cities to receive higher education and remain there after graduation). Their migration experience is significantly different than

those of rural, poor women who follow their families to squatter settlements. Unfortunately though, the "masculinist" formal sector of Turkey's urban economy has not provided enough opportunities for these high skilled migrants to extensively use their skills (Hemmasi and Prorok, 2002). Despite this observation urban women are still considered to work in professional jobs more compared to rural women. According to the Turkish State Institute of Statistics, only about 15% of rural women were engaged in waged employment compared to 34% of urban women participating in the work force according to the 1990 Population Census.

Furthermore, studies show that migrant women also show some diversity in their backgrounds, roles in the migration decision, in their contributions to the success of the family in the city, and in their share in family power distribution. Among the migrant women, there are some Latin American type "initiators" who encourage and lead their families to migrate, and by working under difficult circumstances help to make it a successful experience. In her 1998 study covering 105 migrant women and 39 migrant men living in Ankara's squatter settlements, Erman identifies four major groups including the "initiating" women who have contributed substantially to their families success in the new environment, though often out of financial necessity. Nevertheless, they have gained some power or leverage in the family and developed a sense of self-confidence. Another group has had a better financial situation because of their husbands income, but has remained directly dependent on them. Some have worked as hard as the initiating group, yet have never achieved a similar level of influence and recognition in the family or community. Thus apart from highly educated female professionals, the "initiating" women also play an important role in modifying gender roles and redistributing social power within their families.

To examine how our model performs for different genders, we disaggregated our data to estimate the determinants of gross number of male and female migrants separately. Since males seem to constitute a greater percentage of labor migrants, our initial expectation is that the effects of the economic variables and schooling will be stronger for males. We still expect that the impact of income variables to be significant on female migration, and we moreover expect the effects of the distance variable and the regional dummy to be stronger for females.

Except for the population variables, schooling and the share of young people in a province which are proxies for individual characteristics, all the independent variables are for the general population as we assume that agents observe the unemployment rates, the existing stock of migrants and income with their common values rather than the gender specific values. Moreover, both the unemployment

rates and income of females might be misleading due to the high number of females working as unpaid family workers and low labor participation rates due to the fact that most females who are working as unpaid family workers are not registered in the labor force. ³

Base Model			Extended Model		
Variable	1990	$\Delta 2000$	Variable	1990	$\Delta 2000$
$POPm_j$	0.759*** (0.0289)	0.157*** (0.0332)	$POPm_j$	0.688*** (0.0269)	0.181*** (0.0315)
$POPm_i$	1.094*** (0.0289)	-0.119*** (0.0327)	$POPm_i$	1.063*** (0.0319)	-0.138*** (0.0354)
INC_j	0.107*** (0.0189)	-0.0741*** (0.0219)	INC_j	0.111*** (0.0174)	-0.0766*** (0.0203)
INC_i	-0.200*** (0.0215)	0.133*** (0.0239)	INC_i	-0.315*** (0.0281)	0.256*** (0.0304)
$DIST_{ij}$	-0.431*** (0.0242)	-0.0222 (0.0294)	$DIST_{ij}$	-0.264*** (0.0271)	-0.0440 (0.0322)
Y2000		-1.031** (0.471)	U_j	-5.116*** (0.764)	-1.365 (0.848)
		Observations: 11736	U_i	3.301*** (0.842)	0.138 (0.921)
		R^2 : 0.639	$YNGm_i$	1.890*** (0.432)	-0.0930 (0.550)
			$SCHm_i$	0.0829*** (0.0251)	-0.122*** (0.0297)
			NW_{ij}	1.38*** (0.195)	0.480 (0.348)
			REG	0.718*** (0.0596)	-0.167** (0.0701)
			IST	1.762*** (0.129)	-2.039*** (0.185)
			Y2000		-1.710*** (0.500)
					Observations: 11736
					R^2 : 0.689

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.2: Regression Results (Male)

The variables in the base model for both genders are highly statistically significant and have the expected signs. The model explains the variation in the gross number of migrants for males slightly better than females for both the base model and the extended model. Comparing the coefficients in the two extended models for the first period, all of our economic variables except for the unemployment rate

³Another related problem is the reliability of data. In a survey conducted by Zeytinoğlu et. al.,1999, of 260 women working in private homes in Istanbul, half of the women did not answer a question about their role in the migration decision. This is likely due to many rural Turkish womens sensibility that it is inappropriate (in a patriarchal context) to give a personal point of view until a relationship develops with the researcher (Erman, 2001). This creates a major problem in the reliability of data especially regarding women as a significant amount of data in Turkey is collected through surveys.

Base Model			Extended Model		
Variable	1990	$\Delta 2000$	Variable	1990	$\Delta 2000$
POP_{fj}	0.749*** (0.0317)	0.165*** (0.0367)	POP_{fj}	0.676*** (0.0298)	0.196*** (0.0351)
POP_{fi}	1.100*** (0.0324)	-0.215*** (0.0368)	POP_{fi}	1.074*** (0.0358)	-0.211*** (0.0401)
INC_j	0.161*** (0.0216)	-0.000710 (0.0251)	INC_j	0.159*** (0.0201)	0.00254 (0.0234)
INC_i	-0.192*** (0.0240)	0.213*** (0.0270)	INC_i	-0.328*** (0.0351)	0.313*** (0.0387)
$DIST_{ij}$	-0.557*** (0.0265)	-0.0675** (0.0327)	$DIST$	-0.361*** (0.0294)	-0.0706** (0.0356)
Y2000		-1.783*** (0.520)	U_j	-4.433*** (0.849)	-2.468*** (0.956)
		Observations: 11736 R^2 : 0.634	U_i	4.456*** (1.055)	-1.205 (1.203)
			YNG_{fi}	4.603*** (1.264)	-3.922*** (1.503)
			SCH_{fi}	0.0449** (0.0215)	0.0122 (0.0257)
			NW_{ij}	1.34*** (0.197)	0.775** (0.382)
			REG	0.812*** (0.0646)	-0.123 (0.0778)
			IST	1.839*** (0.137)	-2.400*** (0.203)
			Y2000		-2.362*** (0.650)
					Observations: 11736 R^2 : 0.680

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4.3: Regression Results (Female)

of the receiving province, are stronger for females. Specifically, the migration elasticity of income of the destination province is significantly higher for females. A possible interpretation for this is that males migrate as first movers and job seekers. Most females join their spouse in the destination province in a later period, after the earnings of the male is sufficiently high to support the whole family (Tanfer, 1983). The effect of schooling is both weaker and not as significant for females as it is for the males. This may also support the idea that females are tied migrants as opposed to individual movers who view migration as an investment in their own human capital. Another explanation may be that as stated in the beginning of this section, females cannot fully reap the returns from their human capital and cannot effectively transfer their skills after migration. Therefore, their education levels are not as significant in the migration decision when compared to males. Furthermore, the effect of the share of the young female population seems to be close to three times as it is for males, females seem to be more effected by distance and within region migration dummy is stronger for females. This may be interpreted as follows. Males venture further to seek jobs, while females move with the family or for

marriage purposes to closer destinations.

The results presented here may not be reliable due to data issues stated in this and previous sections. The issues raised in this section are to provide an introduction and to validate our findings on gender and family migration, one needs further analysis.

4.3 Migration Under Uncertainty

We incorporate the effect of uncertainty in our model through direct measures of risk, income correlations and variance. Here we use a model that considers the family as a decision making unit rather than a risk-neutral individual. The main idea is that migration may be viewed as an opportunity to diversify risks for the family through allocating its members to alternative locations where incomes are highly but not positively correlated. As a result, migration may occur even if there are no significant income differentials present between home and alternative destinations. Building on this idea, Daveri and Faini (1999) derive a model of family migration under uncertainty. Non-zero correlation between incomes earned in different locations, sufficiently concave (in family size) mobility costs to ensure that all members of the family migrate to the same location and heterogeneous tastes for location across households which ensures that different families from the same location migrate to different locations (Daveri and Faini, 1999) are the main features of the model. The two propositions they derive from their theoretical model are as follows (Daveri and Faini, 1999, pp. 602,603):

Proposition 1 *A rise in the correlation of incomes earned at home and at an outside region leads to a decline of migration to that region and an increase in migration to an alternative outside region*

Proposition 2 *A rise of home income variability has in general an ambiguous effect on total migration as well as migration to any destination i . However, the following sufficient conditions hold:*

1. *If ρ_i and ρ_j are both negative, then higher income variability at home results in higher total migration;*
2. *If $\rho_i < 0$ and $\rho_i < \rho_j$, with $j \neq i$, then higher income variability at home results in a rise of migration to destination i .*

To understand the first proposition, suppose that the income correlation between the destination of origin and an alternative region i increase, making i a less attractive location to diversify risk, and the marginal benefit of moving to i decreases. Thus this results in an increase in migration to another alternative location j , where $j \neq i$. The second proposition states that higher variance makes home income riskier, so alternative destinations become relatively appealing. If both correlations are negative, then the agent achieves better risk diversification by moving,

thus total migration increases. However, one cannot talk about the effect of variance on migration to a specific location unless the second condition holds.

Daveri and Faini, 1999 test their model using province level panel data on emigrations from Southern Italy to two alternative destinations, Northern Italy (The domestic destination) and Germany (The foreign destination) using direct measures of risk, namely correlations of income between home and the domestic and foreign destination incomes, and income variance at home. They estimate migrations from Southern Italy to Northern Italy and Germany separately, controlling for expected income and other factors such as unemployment, age, education, home income variance and shares of the population working in agriculture and construction. Their results show that the first proposition holds for both domestic and foreign emigrations, but they cannot empirically justify the second proposition.

We extend our gravity model based on this approach. On top of the extended gravity model we previously estimated, we include the home variance α_i , ρ_{ij} the correlation between the income of the province of origin and income at province j and the correlation between the income of province of origin and the rest of the country excluding province j , ρ_{iC} . The idea behind including ρ_{iC} is that it covers all the alternative destinations apart from province j ⁴ All of our risk variables are calculated over the previous ten years of question. Parallel to Daveri and Faini 1999, we expect that a rise in ρ_{ij} will decrease migration to j so it has a negative sign and an increase in ρ_{iC} will have just the opposite effect.

⁴This is a very strong assumption. Ideally the model should include the correlation coefficients for all alternative destinations. However we made this simplifying assumption as the theoretical model is solved based on two alternative destinations and to include all the coefficients in our variable, a generalization of the model would be necessary.

Extended Gravity Model Under Uncertainty		
Variable	1990	$\Delta 2000$
POP_j	0.608*** (0.0278)	0.243*** (0.0333)
POP_i	1.092*** (0.0348)	-0.126*** (0.0403)
INC_j	0.148*** (0.0180)	-0.0615*** (0.0210)
INC_i	-0.309*** (0.0317)	0.212*** (0.0364)
$DIST$	-0.283*** (0.0279)	-0.0749** (0.0333)
U_j	-4.993*** (0.789)	-2.286*** (0.886)
U_i	3.198*** (0.907)	-1.560 (1.008)
YNG_i	4.331*** (0.853)	0.0184 (1.053)
SHC_i	0.0810*** (0.0292)	-0.0873*** (0.0338)
NW_{ij}	1.34*** (0.216)	0.666* (0.378)
REG	0.757*** (0.0608)	-0.152** (0.0720)
IST	1.903*** (0.133)	-2.246*** (0.193)
ρ_{ij}	0.286*** (0.0307)	-0.353*** (0.0366)
ρ_{iC}	-0.331*** (0.0362)	0.357*** (0.0582)
α_i	-0.0000839 (0.000332)	0.000149 (0.000332)
		Observations: 11736
		R^2 : 0.688
Robust standard errors in parentheses		
*** p<0.01, ** p<0.05, * p<0.1		

Table 4.4: Regression Results, Model Under Uncertainty

Looking at the results, we observe that not only signs of both the variables of interest are opposite of our expectations, but also they are highly significant for the first period. Furthermore, when we extend our equation to include risk measures, the increase in the explanatory power of the model is only 0.4%. When we look at the changes for the year 2000, we observe that the coefficients of both of the correlation variables change significantly. The magnitude of the change is such that when we add up the estimated values for our coefficients, we observe that for the year 2000, the signs of the coefficients turn out to be consistent with our expectations. One explanation one may offer is the fact that as information became available in the later period, families started considering the second moment of income as well as the first. However, as these models are essentially micro models, they should be tested using micro data to obtain more reliable results.

Chapter 5

Conclusion and Remarks

In this study, we have provided an overview of the determinants of internal migration in Turkey. First, using data from the 1990 and 2000 population censuses, we gave a descriptive analysis of the characteristics of Turkish migrants. These statistics show that the characteristics of Turkish migrants are in line with stylized facts about migrants. That is, they are income seekers who are younger and better educated when compared to the whole population. However, there is a significant difference between the two genders.

Based on our gravity equation estimations, we can conclude that the determinants of Turkey's internal migration are parallel to the suggestions of several strands of theory. Income differentials have been considered as a very important determinant of migration since the classical approaches such as Lewis, 1954. We find that income differentials play an important role in migration within Turkey, as recent empirical evidence on Turkey also suggests (Gezici and Keskin, 2005; Evcil et. al. 2006). The negative impact of distance has also been emphasized in migration literature since Ravenstein's 1885 study. Indeed, our results indicate that distance is an important deterring factor for Turkish migrants as well. Moreover, adding on to the factors presented by the classical approaches, the probability of employment (Harris and Todaro, 1970) and personal characteristics such as age and education levels in particular (Sjaastad, 1962) are also found to have a significant effect that is in line with the expectations from theory. We have also tested the effect of social networks on migration, and found that they have a significant and positive effect on internal migration in Turkey.

Furthermore we showed the distinction in the determinants of migration among genders. We interpret the statistics and our results as pointing at males as the income seekers and first movers and females as tied movers. This might suggest that family migration models may be more appropriate for Turkey, rather than

models that consider the individual as the decision maker.

The effect of uncertainty and the role of risk-aversion is incorporated in our model using direct measures of risk, income correlations and income variability at home. Our results indicate that for the year 2000, a rise in the income correlation between home and a given destination reduces migration, and a rise in income correlation between home and an alternative destination increases migration to that destination. Although these results are in line with our expectations, they should be approached with caution due to the aggregate nature of the data.

With this study we presented an overview of internal migration in Turkey, we believe a more thorough micro-data analysis of the issues raised here would be fruitful. Especially the issue of gender differences and family migration, and the effect of social networks on internal migration are interesting subjects that are worth elaborating in further research.

APPENDIX

1990		2000	
New Prov.	Org. Prov.	New Prov.	Org. Prov.
Aksaray	Niğde	Bartın	Zonguldak
Bayburt	Gümüşhane	Ardahan	Kars
Karaman	Konya	Iğdr	Kars
Kırıkkale	Ankara	Yalova	Istanbul
Batman	Hakkari	Karabük	Zonguldak
	Mardin	Kilis	Gaziantep
	Siirt	Osmaniye	Adana
Şırnak	Hakkari	Düzce	Bolu
	Mardin		
	Siirt		

Table 5.1: The List of New Provinces, 1985-1990, 1990-2000

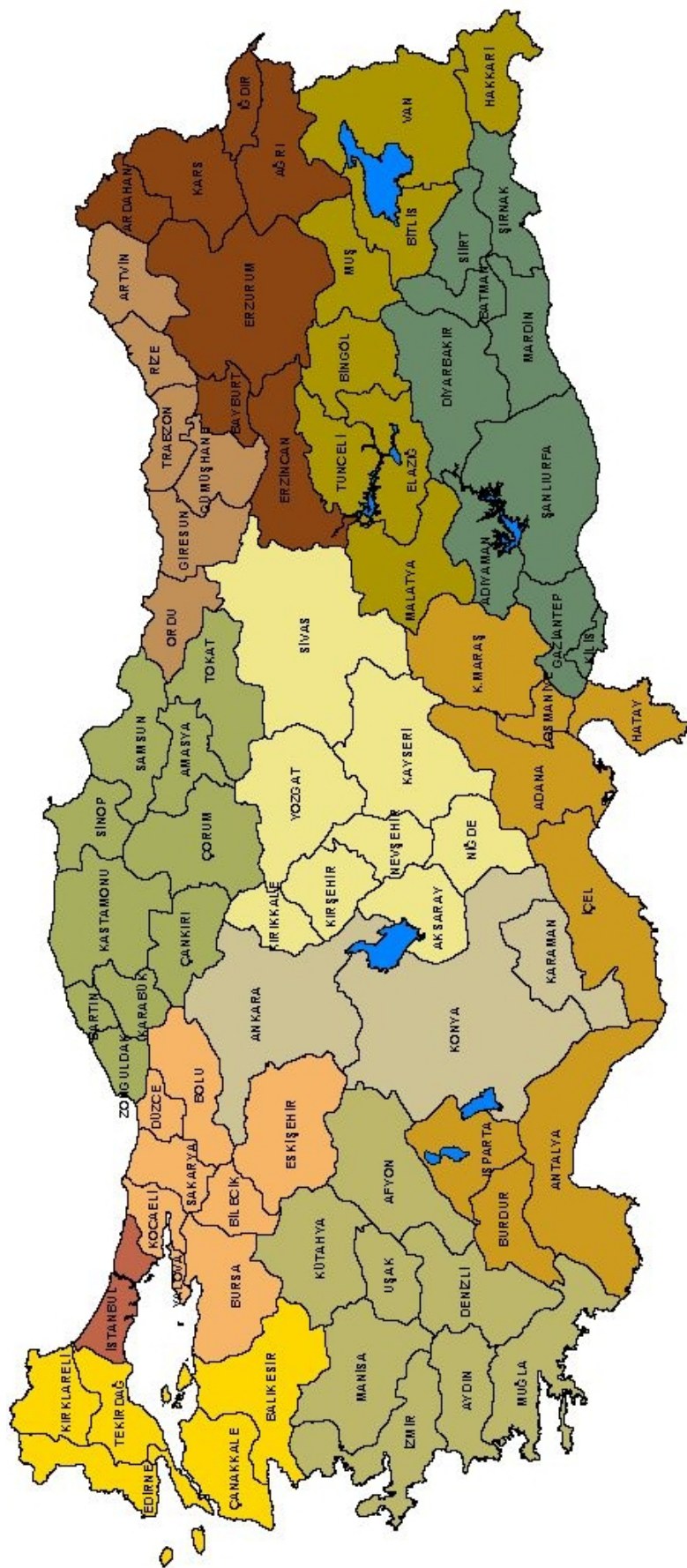


Figure 5.1: NUTS Level 1 Regions, Source: TURKSTAT (2000)

Classification of Statistical Region Units					
Level 1	Level 2	Level 3	Level 1	Level 2	Level 3
TR	TURKEY				
TR1	Istanbul			TR72	
	TR10			TR721	Kayseri
	TR100	Istanbul		TR722	Sivas
TR2	West Marmara			TR723	Yozgat
	TR21		TR8	West Black Sea	
	TR211	Tekirdağ		TR81	
	TR212	Edirne		TR811	Zonguldak
	TR213	Krklareli		TR812	Karabük
	TR22			TR813	Bartın
	TR221	Balkesir		TR82	
	TR222	Çanakkale		TR821	Kastamonu
TR3	Aegean			TR822	Çankırı
	TR31			TR823	Sinop
	TR310	Izmir		TR83	
	TR32			TR831	Samsun
	TR321	Aydn		TR832	Tokat
	TR322	Denizli		TR833	Çorum
	TR323	Muğla		TR834	Amasya
	TR33		TR9	East Black Sea	
	TR331	Manisa		TR90	
	TR332	Afyon		TR901	Trabzon
	TR333	Ktahya		TR902	Ordu
	TR334	Uşak		TR903	Giresun
TR4	East Marmara			TR904	Rize
	TR41			TR905	Artvin
	TR411	Bursa		TR906	Gümüşhane
	TR412	Eskişehir	TRA	Northeast Anatolia	
	TR413	Bilecik		TRA1	
	TR42			TRA11	Erzurum
	TR421	Kocaeli		TRA12	Erzincan
	TR422	Sakarya		TRA13	Bayburt
	TR423	Düzce		TRA2	
	TR424	Bolu		TRA21	Ağrı
	TR425	Yalova		TRA22	Kars
TR5	West Anatolia			TRA23	Iğdır
	TR51			TRA24	Ardahan
	TR510	Ankara	TRB	Centraleast Anatolia	
	TR52			TRB1	
	TR521	Konya		TRB11	Malatya
	TR522	Karaman		TRB12	Elazığ
TR6	Mediterranean			TRB13	Bingöl
	TR61			TRB14	Tunceli
	TR611	Antalya		TRB2	
	TR612	Isparta		TRB21	Van
	TR613	Burdur		TRB22	Muş
	TR62			TRB23	Bitlis
	TR621	Adana		TRB24	Hakkari
	TR622	Mersin	TRC	Southeast Anatolia	
	TR63			TRC1	
	TR631	Hatay		TRC11	Gaziantep
	TR632	Kahramanmaraş		TRC12	Adıyaman
	TR633	Osmaniye		TRC13	Kilis
TR7	Central Anatolia			TRC2	
	TR71			TRC21	Şanlıurfa
	TR711	Kırıkkale		TRC22	Diyarbakır
	TR712	Aksaray		TRC3	
	TR713	Niğde		TRC31	Mardin
	TR714	Nevşehir		TRC32	Batman
	TR715	Kırşehir		TRC33	Şırnak
				TRC34	Siirt

Table 5.2: Classification of Statistical Regions,2000

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