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DEPARTMENT OF ECONOMICS**



**LABOR MARKET IMPACTS OF INTERNATIONAL FORCED
MIGRATION: THE CASE OF TURKEY AND THE EUROPEAN
UNION**

Master's Thesis

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ACCEPTANCE AND APPROVAL OF THE THESIS

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ÖZET

ULUSLARARASI ZORUNLU GÖÇÜNÜN İŞGÜCÜ PİYASASI ETKİLERİ: TÜRKİYE VE AVRUPA BİRLİĞİ ÖRNEĞİ

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Son birkaç on yılda işgücü piyasalarının yapısı ve işleyişi hızlı küreselleşme ve bölgesel çatışmalar gibi etkenlerden dolayı artan göç tarafından etkilenmektedir. Mart 2011'de Suriye'de patlak veren iç savaş, dünyanın farklı bölgelerine yoğun zorunlu göç dalgalarının oluşmasına neden olmuştur. Bu çalışma göçten en çok etkilenen bölgeler arasında en önde gelen Türkiye ve Avrupa Birliği bölgesinde özellikle Suriye iç savaşının etkisi ile başlayan göç dalgasının işgücü piyasalarındaki etkisini incelemektedir. Literatür göçün ev sahibi ülkelerin işgücü piyasası üzerindeki etkisinin göçmenlerin becerileri, yerli işçilerin becerileri ve ev sahibi ülkenin ekonomik özellikleri gibi çeşitli faktörlere bağlı olarak değiştiğini göstermektedir. Göçmenler ekonominin belirli sektörlerinde işgücünü artırarak işgücü arzını etkilemektedir. Aynı zamanda, göçmenler belirli hizmetler ve mallar için tüketici talebini artırmaktadır ve bundan dolayı emek talebi de artacaktır. Bu da göçmenlerin belirli mesleklerde mevcut işler için rekabeti yoğunlaştırabileceği, ancak muhtemelen yenilerini de yaratacağı anlamına gelir. Göçmenlerin mevcut işçilerin ücretleri veya istihdamı üzerindeki kısa vadeli etkisi, göçmenlerin mevcut işçileri değiştirme veya tamamlama konusunda ne kadar iyi olduklarına bağlıdır. Göçün ev sahibi ülkenin kadın ve erkek istihdamı üzerindeki etkisini anlamak amacıyla veri analizi için 2010 yılından başlayarak 10 yıllık dönemi kapsayan istihdam, göç ve büyüme verileri toplanmıştır. Rakamlar, Türkiye'ye ve Avrupa Birliği'ne göçmen akışının, erkek ve kadın istihdamı üzerinde eşit olmayan etkilerle, ev sahibi ülkelerdeki işçilerin istihdamında genel bir düşüşe sebep olduğunu göstermektedir. Verilen göstergeler arasındaki korelasyonun daha iyi anlaşılmasını sağlayacak panel veri tahmin tekniklerine dayalı ampirik analizler yapılmıştır. Sonuçlar, göçün etkisinin hem göçmenlerin hem de yerlilerin becerilerine, ekonomik yapıya ve ev sahibi ülkenin özelliklerine bağlı olarak değişmeye eğilimli olduğunu ve ekonomideki farklı sektörler arasında da farklılıklar gösterebileceğini ortaya koymaktadır.

Anahtar Kelimeler: Göç, İstihdam, İşgücü piyasası

ABSTRACT

LABOR MARKET IMPACTS OF INTERNATIONAL MIGRATION: THE CASE OF TURKEY AND THE EUROPEAN UNION

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Over the last few decades, the structure and functioning of labor markets have been affected by migration, driven by factors such as rapid globalization and regional conflicts. The civil war in Syria, which broke out in March 2011, has resulted in a massive wave of forced migration to different parts of the world. This study examines the impact of the migration wave, which started with the Syrian civil war, on the labor markets in Turkey and the European Union as the two most prominent regions among those affected by migration. The literature suggests that the effect of migration on the host nations' labor market varies depending on several factors such as the skills of migrants, the skills of native workers, and the characteristics of the host country's economic characteristics. Immigrants affect labor supply by increasing the workforce in certain sectors of the economy. At the same time, they increase consumer demand for certain services and commodities and are imminent to increase in labor demand. This means that immigrants can intensify competition for existing jobs in certain professions, but will probably also create new ones. The short-term impact of migration on the wages or employment of existing workers depends on how well the migrants have the skills to replace or complement existing workers. In this thesis, to understand the effect of migration on the employment of men and women of the host country, employment, migration, and growth data covering the 10-year period starting from 2010 were collected. The descriptive and graphical analysis provide important evidence concerning the behavior of employment indicators in relation to migration. The figures assert that the inflow of migrants to Turkey and to the European Union has gone hand in hand with an overall decrease in the employment of host nations' workers, with unequal effects on the male and female employment. Subsequently, empirical analyses based on panel data techniques were conducted which led to an increased understanding on the correlation between the given indicators. The results reveal that the impact of migration is prone to vary depending on skills of both migrants and natives and the economic structure as well as the characteristics of the hosting nation. The effect can also show disparities among different sectors in the economy.

Keywords: Migration, Employment, Labor market.

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Mohammed ADEM

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SYMBOLS AND ABBREVIATIONS

CD	: Cross-section Dependence
EU	: European Union
EUROSTAT	: The Statistical Office Of The European Union
FE	: Fixed Effects Model
GDP	: Gross domestic product
LM	: Lagrange Multiplier
N	: Cross-section dimension
NMR	: Net Migration Rate
OECD	: Organisation for Economic Co-operation and Development
POLS	: Pooled Least Squares Model
RE	: Random Effects Model
T	: Time dimension
TURKSTAT	: Turkish Statistical Institute
UNHCR	: United Nations High Commissioner for Refugees
VAR	: Vector Autoregression

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I. INTRODUCTION

Migration is one of the three factors causing population changes, the others being the birth and death of individuals. However, the way migration affects the structure of population is different from the death and birth, since migration is anything but a biological phenomenon. Rather, it is affected by social relations, cultural norms, economic situations, and political factors (IOM.INT, 2003). The phenomenon of migration has been going on since the earliest history of humanity and can be observed all over the world.

Before dwelling on a detailed analysis of migration, its definition and specifics need to be stated clearly. Migration can be classified into different groups depending on the nature, the duration and the reason behind it. According to the nature of the location, it is divided into two basic categories; namely, internal and external migration. Internal migration refers to a relocation inside one's national boundaries for example, between states, regions, urban communities, or districts. On the other hand, external migration refers to the relocation over national boundaries. Based on permanence of the relocation, migration again can also be divided into two basic categories which are permanent and temporary migration. Permanent migration is when the relocation takes place with the intention of not returning to the place of departure. Temporary migration refers to the relocation for only a limited amount of time. With respect to the causes and inspirations that have led to the migration, it can be categorized into voluntary migration and forced migration. Voluntary migration is when the relocation has resulted from the free will of the migrant. (Wimalaratana, 2016). Forced migration is a category that refers to migrants leaving their place of living without any other choice. According to UNHCR (2021) a person who has been forced to flee his or her country due to persecution, war or violence is called a refugee. A refugee has a well-founded fright of persecution for reasons of race, religion, nationality, political opinion or membership in a particular social group. An asylum-seeker, on the other hand, is a person whose request for sanctuary or to get a status of refugee has yet to be processed. Every year, around one million people apply in various countries seeking asylum. (UNHCR, 2021)

Unfortunately, forced migration and displacement have increased drastically in the past couple of years. There have been occasions that caused significant difficulties

and trauma as well as loss of life. To mention some of these events, the ongoing conflicts in the Syrian Arab Republic, The Republic of Iraq, Yemen, Ethiopia, Central African Republic, Libya, Democratic Republic of Congo and South Sudan, has resulted in the displacement of millions of individuals from places they had been residing. People were also forced to seek security due to the violence in Myanmar and Bangladesh. The severe economic hardship and political instability that millions of Venezuelans has faced is also given as another example that caused mass migration. These and many other factors have so far forced people to leave their countries and flee to neighboring countries or even overseas.

According to UN's migration report (2020), the number of international migrants globally has reached 272 million. And that makes 3.5% of the worldwide population. 7 migrants out of 10 international migrants were between the ages of 20–64, and that had an impact in the labor market of the country that receives them. This phenomenon gives rise to discussions on political, economic, cultural, and many other fronts. Right-wing populist movements have gained power due to their reactionary stance against migrants all over the developed world. Yet hundreds of thousands continue to migrate, usually fleeing from poor living conditions and civil wars.

Immigrants aim to achieve different and innumerable expectations and needs in the country they migrate to. People migrate in order to have a better quality of life, to have a good job and to earn more money. Depending on the situation, it is possible to make a broad breakdown of needs, starting from basic biological needs such as food and shelter, to economic, legal status, psychological and social needs.

When Syria was first hit by the civil war in 2011, the country had a population which was around 21.08 million. In the nine years since the beginning of the conflict, approximately half of its population has been displaced internally and mostly internationally. This led to Syria having the largest refugee population in the world. While the greater part of Syrian refugees remains in the Middle East, millions have also taken hazardous journeys across the Mediterranean and further. In the year 2018 alone, members of the European Union took in excess of 96,000 migrants from Syria, approximately a third of the asylum seekers went to Germany (Eurostat, 2021). As the number of people who had to migrate across the world due to wars, violence, and persecution hit top levels of all time, Turkey continues facilitating the biggest number

of refugees. Turkey currently hosts some 3.6 million documented Syrian refugees along with close to 370,000 persons of concern from other nationalities.

The main concern of this study is about how refugees affect the natives' labor market outcomes. Specifically, it analyzes the effect of migration on the employment and unemployment dynamics of Turkey and Europe. The economic theory suggests immigration causes a non-significant change in the long run. This is because labor supply curve shift right, meaning the labor supply will increase and also, immigrants increase the demand for goods and services through consumption which in turn increase the demand for labor. The short-term effects of migration vary depending on the nature of the receiving economy, the extent to which the new comers have skills that substitute or complement those of existing workers.

International forced migration in the short run is undocumented especially in the situations like the Syrian conflict where people are displaced in masses over a short period of time. It is important to mention that the data used in this study represents documented migrants and figures of formal employment of the host nations. Since numerous migrants, whether they are documented or undocumented, are employed under the counter, this study can only estimate the indirect effect these unregistered migrants have on the labour market. This study specifically estimates the relationship between the migrant inflow and the formal employment of native workers. A further detailed study is needed to demonstrate a full scale analysis which include undocumented migrant inflow and migrants and locals working without social security.

The thesis is composed of five chapters. In the following chapter, the theory and literature on labor market impacts of migration is investigated. Although most of the literature mainly focus on the wage effects, there are several studies that have applied different methods to analyze how migration affects employment of natives. Bonin (2005), Angrist and Kugler (2003) and Dustmann et al. (2005) are some examples to be discussed in the literature review. In the literature, the results are varying from a study to another. The effects of migration on the labor market of the host country critically depend on the skills of migrants, the skills of native workers, and the characteristics of the host country's economic characteristics. As pointed out in the studies above, they are also prone to vary between the short and long-run when the economy and labor demand can adjust to the increase in labor supply. Immigration

influences the labor supply, as it increases the pool of laborers in specific sectors of the economy. Simultaneously, immigration probably causes an increase in the demand for labor, as migrants expand consumer demand for certain goods and services. That is, immigration may increase competition for existing jobs in certain occupational positions but it also creates new jobs.

In Chapter 3, the data sets used in the thesis are presented and discussed in detail. The annual figures of employment by gender, unemployment by gender, employment by sector, unemployment by education level, net migration to population ratio, and GDP per capita between the years 2010 and 2019 were collected. For 30 countries in total, the data mentioned above were obtained from the Eurostat, the statistical office of the European Union, Macrotrends platform and Organization for Economic Co-operation and Development (OECD) databases.

In Chapter 4, the relationship between labor market and migration in Turkey, and to Europe are estimated by using panel data techniques. The data organized in a panel model was analyzed using fixed effects and random effects models after going through diagnostic tests. Panel Data is defined as the collection of cross-sectional observations of units such as individuals, countries, firms, households in a certain period. Since studies based on cross-sectional data and time series are incomplete in solving some economic problems, this deficiency is expected to be eliminated by panel data studies. (Baltagi B. , 2005). Panel data studies provide the researcher with a wide range of possibilities because it combines both cross-sectional data and time series data and several advantages follow. First and foremost, it leads to an increase in the number of observations and the degrees of freedom. Second, estimates obtained by decreasing the multicollinearity between the variables become more effective and reliable. Third, the exclusion of some unobserved variables in cross-section and time series studies causes biased estimates while panel data analysis yields less biased or unbiased estimates without excluding these variables. Fourth, panel data analysis considers heterogeneity according to cross-section and time series in solving problems. Because the panel data deals with units such as individuals, firms, cities, and countries over time, the heterogeneity in these units can be captured via panel data methods (Gujarati, 2011). Finally, the results and discussions are presented. This chapter provides a combined discussion on the literature, the data and the empirical analysis. Therefore, it collects the overall material and aims to open new doors for further

treatment of migration and its effects on the employment and unemployment of the citizens of the host country.

II. THEORY AND LITERATURE

The theory of migrations impact on the labor market of host nations and former studies related to the concepts of migration, labour market and the relationship between migration and labour market will be discussed in this chapter.

2.1. Types of Migration

Migration by Cause of Formation

Voluntary Migration

Voluntary migration occurs when people leave their places willingly motivated by various pull factors. Pull factors leading to voluntary migration are factors such as the desire to raise the standards that people are in, better education, benefit better from social services, employment, better personal freedom and beliefs, desire to be with friends, family, relatives and people of the same culture.

Forced Migration

Forced migration occurs when people have to leave their place against their will due to push factors like Wars, Natural disasters, Inadequacy of social services, Difficulties in meeting basic needs, Unemployment, Religious, political and ethnic pressures, Need for security, and Impact of government plans such as dam and road construction

Migration by Duration

Seasonal (Temporary) Migration

Temporary migration is the periodic relocation of a population from one place or climate to another in accordance with the yearly cycle of weather and temperature changes. while Temporary migration is relocation which is not ment to be permanent, for a specified and limited period of time, and usually occurs for a specific purpose.

Permanent Migration

It is the permanent departure of people from their place of residence for political, social, economic and natural reasons. It can be voluntary as well as mandatory.

Migration by Distance

Internal Migration

Migration that takes place within the borders of the country. They can be permanent as well as temporary. Regions where trade and industry are developed, fertile agricultural areas, areas with rich mineral deposits, attractive centers in terms of tourism and cultural cities are centers of immigration.

International Migration

International migration occurs when people cross state boundaries and stay in the host state for some length of the time. This relocation can be permanent as well as temporary or voluntary as well as forced.

This study specifically focuses on the impact of international forced migration on the labor markets of the host nations.

2.2. Theoretical Insights: The impact migration on the labor market

The temporary or permanent displacement of people for political, social, economic and natural reasons is called migration. With a more detailed definition, migration is the geographical displacement movement of human communities from one settlement unit to another, in order to spend their whole or part of their lives due to religious, economic, political, social and other reasons. Relocation for personal reasons and all of the goods transported meanwhile are called migration. In addition, Movement of persons from one state to another, or within their own country of residence, for the purpose of employment is also called labour migration. In order to understand forced migration, it is necessary to talk about how migration differs according to the reasons for its formation

The impact of immigration on the labor market depends fundamentally on the labor quality and skills of migrants, the qualifications of existing workers and the characteristics of the host nation's economy. These impacts are also likely to show variation in the short run and the long run when the economy and labor demand are able to adapt to the increase in labor supply. Immigration has an effect on the labor supply because it increases the labor force in certain sectors of the economy. At the same time, immigration is imminent to elevate the demand for labor as immigration increases consumer demand for certain services and goods. This means that immigration can increase the level of competition for the already existing jobs in

certain occupational sectors, but it is also most likely to create new jobs. The downright short-term impacts of immigration on the wages or employment of existing workers depend on the degree to which migrants have skills that replace or complement those of existing workers. (Borjas, 1995)

If emigrant and refugee workers take place of existing workers, immigration is likely to increase competition for jobs and lower wages in the short term. In terms of employment, the degree to which falling wages increase unemployment or inactivity of existing workers depends on their voluntariness to accept the new lower wages. In other respects, when the skills of migrants complement those of existing workers, all workers experience higher productivity, which can lead to an increase in the earnings of existing workers. In general, low-skilled workers are expected to face increased competition from newly arriving emigrants because the skills required for these jobs are easier to acquire and need less specialization.

It is critical to recognize that the analysis of the impact of immigration on the labor market faces numerous methodological difficulties. For instance, since emigrants mostly prefer going to places with better economic conditions and higher labor demand, immigration can be seen as both a cause and a result of changes in wages and employment. This makes proof of causality challenging.

Another issue with analyzing the labor market effect of migration is that international immigration to a particular location can result in some workers leaving that area and moving to other parts of the country or overseas. When this happens, the impact of the labor market in a given area are spread throughout the country, making it difficult to correctly measure through analysis of the local labor market.

2.3. Literature Review

The effect of immigrants on the host country's labor market is a long-term matter of interest for economists and a crucial issue of public debate in countries that receive enormous quantities of immigrants. The Syrian refugee wave has been one of the biggest that Turkey and the European Union has faced. This wave is expected to have long term effects on the host countries' economies. Therefore, there is a large literature focusing on understanding and interpreting these effects.

Del-Carpio and Wagner (2015) evaluate the labor market effects of Syrian refugees in Turkey during 2011-2014 using the ordinary least-squares method. According to TurkStat data on labor statistics, they state that the Syrian refugees in Turkey are massively employed informally because they were not issued permission for employment, and so their arrival created a visible supply shock to informal labor. They replace the unqualified Turkish workers as a source of cheap labor. On the other hand, the educated Turkish male workers have started to work in more qualified formal jobs, thus causing a positive change in registered employment. The study also finds that the same positive development is not valid for low-skilled domestic female workers.

Ceritoglu et al. (2017) employ a difference-in-differences methodology to evaluate the impact of the Syrian refugee wave. The TurkStat Labor Force Surveys (LFS) of 2010-2013 period is used in the study. The first of January 2012 is taken as the treatment date and the data is divided into two parts as pre-treatment (2010-2011) and post-treatment (2012-2013) periods. A “treatment area” from cities which are located in the Southeastern part of the country is constructed. The refugee population ratio in these cities is above two percent and the 4 regions that are neighbors to the treated ones are taken as the control regions. Their sample is confined to individuals between ages 15 and 65. The authors find a significant decrease in the informal employment to population ratio for both men and women. Formal employment for men increases slightly. But the wage outcomes have mostly remained unaffected, for both formal and informal sectors. The authors presume that the constrained inflow of Syrian refugees from the Southeastern line of Turkey, have adversely influenced the employment outcomes of the locals in the treatment region compared to the control zone.

Aksoy and Tumen (2020) focus on the environmental impact of Syrian refugees in Turkey. Following the World Bank’s Local Governance Performance Index, and using an instrumental variables method, they show that the Syrian refugee influx has had negative environmental impacts along several dimensions in Turkey. They find that, on average, the Syrian refugee influx has increased solid waste, wastewater, and dispersed clean water levels in Turkey. Specifically, they point out that the worsening in environmental outcomes is almost totally driven by provinces with low quality administration. It is also concluded that the results can be generalized

to other refugee-hosting countries in Europe, the Middle East, and certain regions of Africa and Asia.

Angrist and Kugler (2003) examine the relationship between immigration and employment in EU countries between 1983-1999 focusing on the extent to which displacement effects of immigration are mitigated or amplified by cross-country differences in institutions, using the panel data analysis and specifically fixed-effects model. In their study, the authors state that migration caused a decrease of 0.7-1.6% on the employment of domestic male workers, but it did not have a significant effect on the employment of female workers.

Dustmann et al. (2005) investigate how migration might impact the labor market structure of domestic workers in England, by providing theoretical discussions on the economics of migration. The researchers argue that the theoretical background of migration cannot precisely explain the effects of migrants on the labor market of the host country. In the study, it is stated that taking into account the possible differences in migration types significantly affects the results obtained, and it is stated that unlike the USA and some continental European countries, immigration to England is not only composed of workers with low skills. Results for the UK economy covering the period 1988-2000 reveal that migration negatively affects local employment with secondary education and lower-wage jobs; however, this impact diminishes over the long run. In addition, the study states that as migrants acquire skills specific to the host country, access to employment networks becomes easier and the negative impact on average wages will decrease.

Bonin (2005) analyzes the effect of immigration on wages and employment in his study on Germany covering the period 1975-1997. In the migration model, where he works with panel data, he finds that the increase in the number of immigrant labor decreases wages but does not increase unemployment.

Steinhardt (2011) discusses the determination of the appropriate approach to be used in examining the effects of immigration in Germany on the domestic labor market. For this purpose, the data obtained from the Employment Research Institute (IAB) covering the period 1975-2001 is used. Firstly, the wage effects of migration are analyzed at the level of skill groups based on educational attainment and labor market experience determined by Borjas (2001) and Bonin (2005). The results confirm past findings that propose that immigration in Germany has no negative impact on

domestic labor wages. Analysis for women shows that migration has a negative impact on relative local wages. Later in the study, based on the observation that immigrants with similar education and experience and the local workforce can work in different professions, the analysis is expanded at professions level. The findings show that there are adverse wage effects for the domestic workforce, especially in basic service occupations. For this reason, Steinhardt emphasizes the necessity of modeling the institutional and socioeconomic differences between immigrants and indigenous labor in future studies.

Shan et al. (1999) analyze the relationship between immigration and unemployment in Australia and New Zealand with the help of vector autoregression (VAR) analysis, using three-month time series data for the period 1983-1995. The results reveal no causality between migration and unemployment. Instead, it is concluded that there is causality from other economic variables to unemployment. Furthermore, the paper indicates that there is a two-way causality running between capacity utilization and immigration. This suggests that economic growth in these two nations, in any event during the post-1980 period, was helped by immigration.

Cohen-Goldner and Paserman (2004) investigate the dynamic effect of immigration in the labor market by using the hourly wage and migration rate in Israel. In their regression analysis covering the period 1989-1999, they find that an increase in the share of immigrants reduced wages in the short run. On the other hand, migration has no effect on employment, there is no impact in the short term and also in the long term.

Stating the presence of little economic research on the effect of immigration on native-born Canadians' labour market performance, Tu (2010) examines the impacts immigrants by sub-labour markets (categorized by skill types and geographic areas) on the native wage growth using first difference and two-stage regressions analysis, using 1991, 1996 and 2001 Canadian census data. After accounting for biases caused by native mobility, endogenous location of immigrants and labour demand shifts, the estimated effects of immigration flow are consistently insignificant or significantly positive. The results are robust to various specifications of sub-labour markets at city, provincial and national levels, suggesting that there is no evidence for a negative impact on native wage growth rates from the substantial immigrant inflows during the 1990s.

Boubtane et al. (2013) use panel data method for 22 OECD countries to examine the causal relationships between migration, unemployment, and GDP. The Kónya causality test was preferred in the investigation to reveal the causality relationships specific to each country subject to the analysis. According to the results of the Kónya causality test, a negative causality relationship was found between unemployment and immigration only in Portugal. A causal relationship between migration and unemployment has not been found in any country except Portugal. On the other hand, a positive causality relationship from growth to migration was detected only in France, Iceland, Norway, and the United Kingdom among the 22 OECD countries. The researchers state that the results obtained from the study reveal that migration flows do not harm the employment prospects of local people. Based on this outcome, the researchers state that numerous OECD countries see migration as a potential solution to close the labor gap to tackle the aging population issue and that the results of the study support this.

Docquier et al. (2011) analyze the labor market effects of net immigration and emigration during the 1990's in countries which are members of OECD. They organize a comprehensive database of migrants, grouped by education level and country of origin/destination, between the years 1990 and 2000. Using the consensus aggregation procedures of labor demand and supply they analyze the long-run employment and wage effects of immigration and emigration. In all cases, they find that immigration had a positive effect on the wage of less educated natives. It also had a positive or no effect the average native wages and native employment. To the contrary, emigration had a negative effect on the wage of less educated native workers and it contributed to increase within country inequality in all OECD countries.

Carrasco et al. (2005) study the impacts of migration on the labor market of Spain. In spite of the fact that Spain is a country with a moderately low extent of foreign population, an increase by approximately 70% in the number of foreign workers with work licenses has been registered in the years between 1993 and 1999. The authors use four different data sources to evaluate this issue. They also use an alternative sample of immigrants who entered the country illegally and examine the correlation between migration and the rates of employment among groups of laborers characterized by education levels, gender, and past work experience. They reach to the result that migrants with work permits have some negative effects on the employment

rates of native- laborers, and employment rates are characterized by sectors of activity. They also find that legal immigration has a rather lower effect on the employment of domestic laborers. Conversely, they find negative but statistically insignificant impacts of migration on the employment rate of native workers when considering total migration.

Sevinç et al. (2016) examine the relationship between migration and economic growth throughout the years 1962-2012, using panel data analysis for 18 developing countries. In the study, it is mentioned that there is a cross-sectional dependency among country groups, and that sudden changes in any of these countries affect other countries as well. The authors reveal the existence of a significant relationship between migration and economic growth, determined for 13 out of a sample of 18 country groups. In addition, while evaluating the relationship between variables, it is stated that migration affects economic growth positively in 7 out of 13 countries and negatively in 6 countries. This situation can be interpreted as a relatively unqualified labor force may have migrated in countries where the coefficients are positive, while in countries where the coefficients are negative, the relatively qualified labor force may be migrating.

What we can see from the literature review is that migration's impact on the labor market hosting nation is dependent on mainly two factors. The first being skills of both migrants and natives and the second, the economic structure and characteristics of the hosting nation. It has been pointed out in the studies above, the impact of migration is prone to vary between the long term and short term because the market can adjust to the increase in the supply of labour. By increasing the number of laborers in certain sectors of the economy, immigration influences the supply of labour. Simultaneously migrants have to consume certain goods and certain services, which causes an increase in the demand for those goods and services eventually leading to an increase in the demand for labour. Even though migration may result in increased competition in already existing occupations and positions, it also creates new jobs and expands existing ones. Hence, the ultimate impact of migration on the employment dynamics can only be discussed with respect to the individual characteristics of the host country, which will be analyzed in the next chapter.

III. DATA ANALYSIS

One of the most important stages of conducting econometric research is collecting and interpreting the data. In addition to gathering the data from reliable sources, collecting the data in accordance with the model to be used in the research also significantly affects the reliability of econometric estimations. At this point, it is necessary to mention the three types of data used in econometric analysis. These can be classified as time series data, cross-sectional data, and panel data (Hill, Griffiths, & Lim, 2011).

Time series data is the data that displays the change of the values of the variables according to time units such as day, month, season, and year. Cross-section data is the kind of data collected from different units at a certain point in time. The term “unit” is used to express econometric units such as individual, household, firm, sector, and country. Panel data is defined as the collection of cross-sectional observations of units such as individuals, countries, firms, households in a certain period. The panel data consists of N units and T number of observations corresponding to each unit. (Baltagi, 2005). Panel data, which is a method of evaluating cross-section and time series together, provides ease of working with more data on the one hand, and on the other hand helps to increase the level of efficiency and reliability. As Tatoğlu (2016) points out, the first notable applications of panel data techniques are Hildreth (1950) (Kuh, 1959) on investment, Grunfeld (1958), Zellner (1962), Balestra and Nerlove (1966) on demand for natural gas (Tatoğlu, 2016).

The empirical part of this study utilizes panel data due to a number of reasons. First, panel data studies provide the researcher with a wide range of possibilities on the subject of study due to the combination of both cross-sectional data and time series. This leads to an increase in the number of observations and the degrees of freedom. Second, the estimates become more effective and reliable since the multicollinearity between the variables diminishes. Whereas the studies based on cross-sectional data and time series are incomplete in solving some economic problems, this deficiency is expected to be eliminated by panel data studies (Baltagi, 2005). Third, the exclusion of some unobserved variables in cross-section and time series studies causes biased estimates. Panel data analysis yields unbiased or less biased estimates without excluding these variables. Last but not least, panel data analysis considers heterogeneity according to cross-section and time series in solving problems. Because

the panel data deals with units such as individuals, firms, cities, and countries over time, these units contain inherent heterogeneity (Gujarati, 2011).

Baltagi (2005) states that besides the advantages of panel data analysis, it also has some limitations. These are, respectively: (i) data collection and organization issues, (ii) various measurement errors due to the comprehensiveness of the panel data, (iii) subject selectivity, (iv) increasing the time span of the panel increases the chances of attrition and the computational difficulty for micro panels, specifically for limited dependent variable panel data models, (v) cross-sectional structures are not taken into account in macro panel structures consisting of long time series.

In this thesis, the relationship between labor market and migration in Turkey, compared to Europe, is investigated using annual data for the period 2010-2019. Employment rate by gender, employment rate by sectors and unemployment rate by education level in order to represent the employment in the panel data indicators of employment by gender, employment by sector, unemployment by gender and unemployment by education level are collected. Net migration to population ratio is used to represent migration indicators. GDP per capita and population are used as control variables. The data were obtained from the Eurostat, the statistical office of the European Union, World bank and Organization for Economic Co-operation and Development OECD databases. Subsequently, we discuss the characteristics of the data.

3.1 Employment

The dependent variable in the empirical analysis is the rate of employment. The rate of employment, which is obtained from Eurostat database is defined as a measure of the degree to which available labor resources (people who are legally allowed and available for work) are used. They are calculated as the ratio between the employed and the economically active population. Employment rates are cyclical but will be significantly influenced in the long run by government policies on education and income support, as well as measures to promote the employment of women and disadvantaged groups. Employed persons are persons aged 15 and over who declare having been employed for at least one hour in the previous week or who were employed in the reference week but were absent. The working-age population refers to those between the ages of 15 and 64. This indicator is seasonally adjusted and

measured in thousands of people aged 15 years and older; and the number of employed persons aged 15 to 64 as a percentage of the labor force.

Employment in Turkey

According to a study by OECD (2018) Turkey is among the best performers among OECD countries in terms of employment resilience and has the second-highest labour productivity growth among OECD countries after Ireland, over 2010-16. However, Turkey has the lowest employment rate and one of the highest broad labour underutilization rates among OECD countries, mainly due to low participation of women. The country has also an unemployment rate that is significantly higher than the OECD average.

The overall employment rate of Turkey has significantly increased between the years 2010 and 2018, reaching an all-time high of 55.60 in January of 2018. Turkey's foreign exchange and debt crisis, which took effect as of 2018, was felt most socially and economically on foreign exchange rates and the Central Bank's foreign exchange reserves which later affected the real economy. Although it has shown a consistent increase between the years 2010 and 2018, as it can be seen in Figure 3.1, the rate from 2018 to 2019 is on a free fall declining to where it was 4 years before.

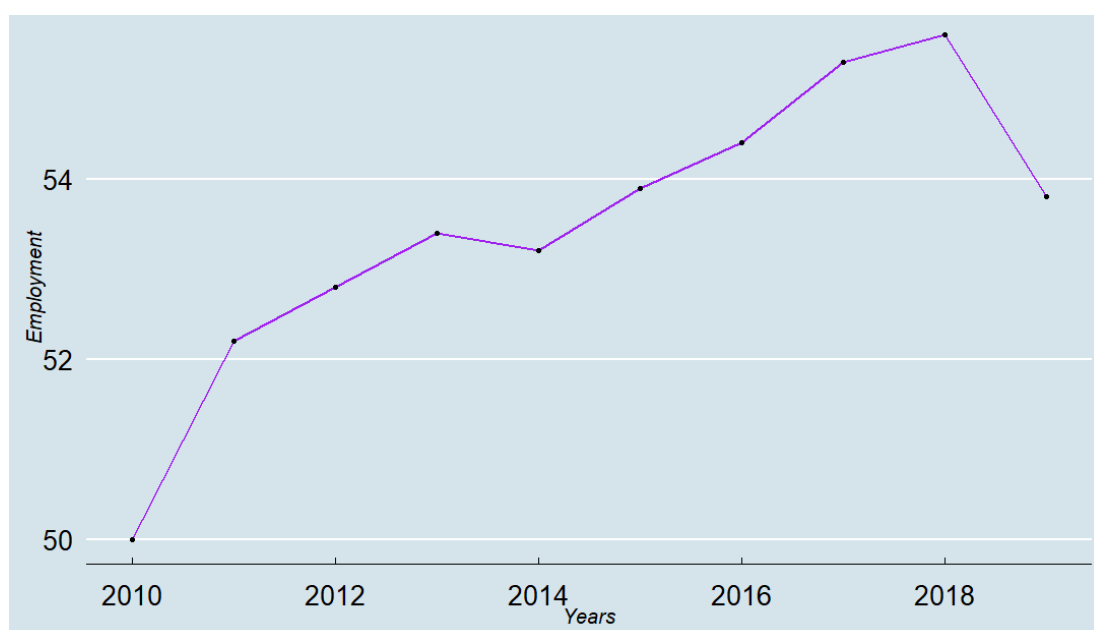


Figure 3.1: The rate of overall employment for Turkey

But the overall employment may further be decomposed for female and male employment as the upsurge in migration may have gender-specific implications.

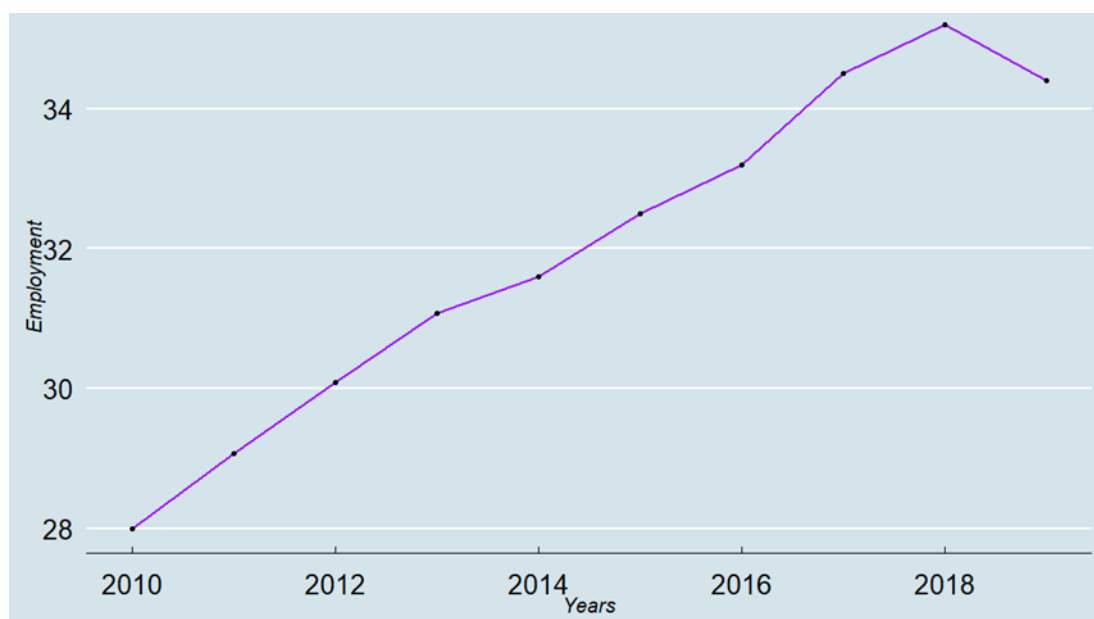


Figure 3.2: The rate of female employment for Turkey

The female employment rate in Turkey is one of the lowest in Europe and the lowest among OECD countries. When looking at the difference between male and female employment rates, Turkey is at the top of the table by far. For example, in 2018, the difference in Turkey is almost twice that of the nearest country. While this difference was 12 percent on average in 2018 in 28 countries of the European Union (EU), this rate increased to 41 percent in Turkey. As shown in figure 3.2 female employment has been steadily growing reaching its all-time high in 2018. Even though the economy was affected by the currency crises which began in summer of 2018, unlike male employment in figure 3.3, the female employment rate was slightly affected.

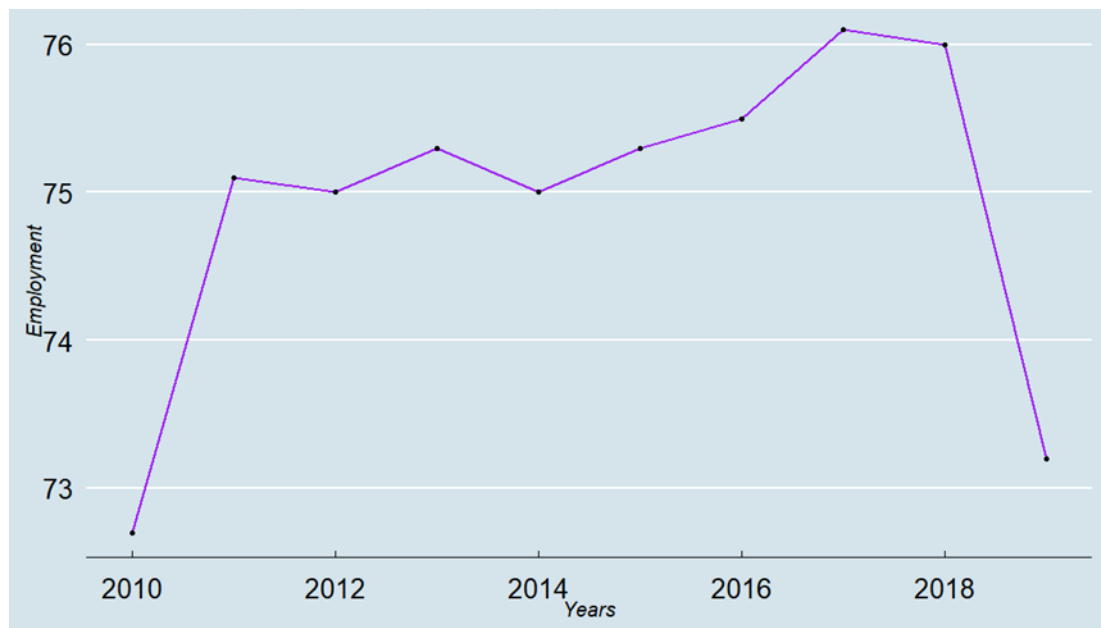


Figure 3.3: The rate of male employment for Turkey

Unlike the female labor force participation rates men's labor force participation rate in Turkey is similar to that of OECD countries (except for older workers for whom early retirement possibilities were available) The participation rate of 18- to 59-year-olds in 2018 was 85% for men (Demirci & Kirdar, 2021).

To further decompose the employment rate, Figure 3.4 demonstrates the employment rates in industry, agriculture and services. A slight increase in employment in industry together with a slight decrease in employment in agriculture could be explained by internal migration within Turkey. The fall in employment in agriculture continues while the increase in industry sector was at first short termed but then eventually starts to fall all over. The rate of employment in services, unlike the other two sectors, is in an unfluctuating increasing trend.

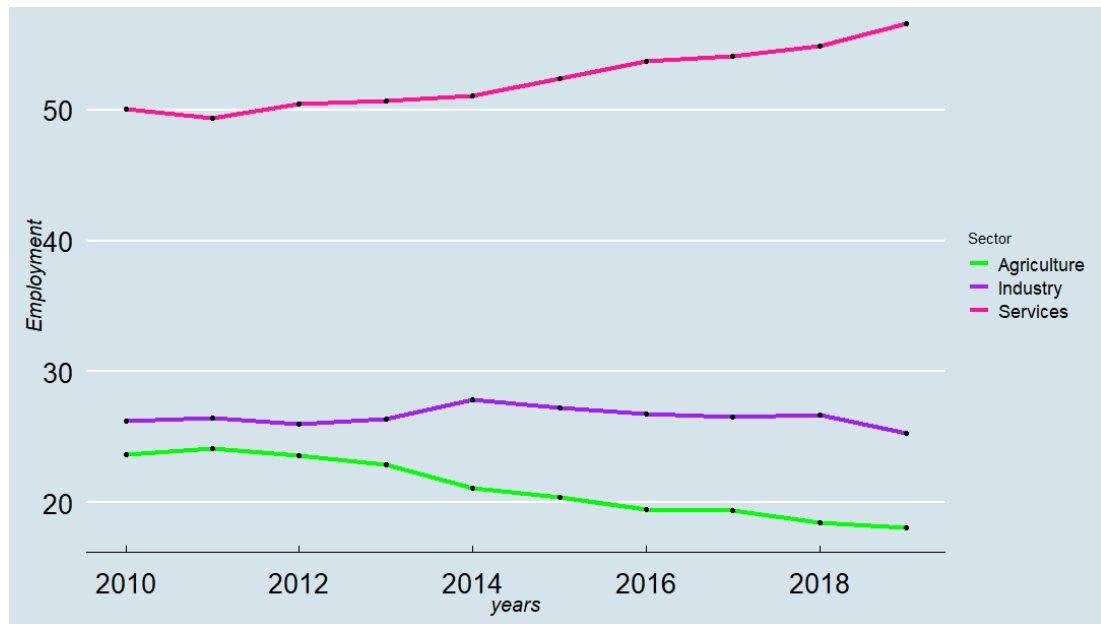


Figure 3.4: The rate of employment by sectors for Turkey

Employment in Europe

To have an overall impression of the structure of the labor market of European union, the EU Labor Force Survey data was examined. According to the EU Labor Force Survey data for the first quarter of 2021 published by Eurostat, in the European Union (EU), in the first quarter of 2021, the labor market volume between the ages of 20-64 was determined as 71.9 percent, with seasonal effects taken into account. Accordingly, the first three countries with the highest employment rate in the EU in the first quarter are the Netherlands with 81 percent, Sweden with 79.5 percent, and Estonia with 79.4 percent. The three lowest countries are Greece with 58.3 percent, Italy with 61.1 percent, and Spain with 66.6 percent (Eurostat, 2021). The rate of average overall employment over the years 2010-2019 is presented in figure 3.5.

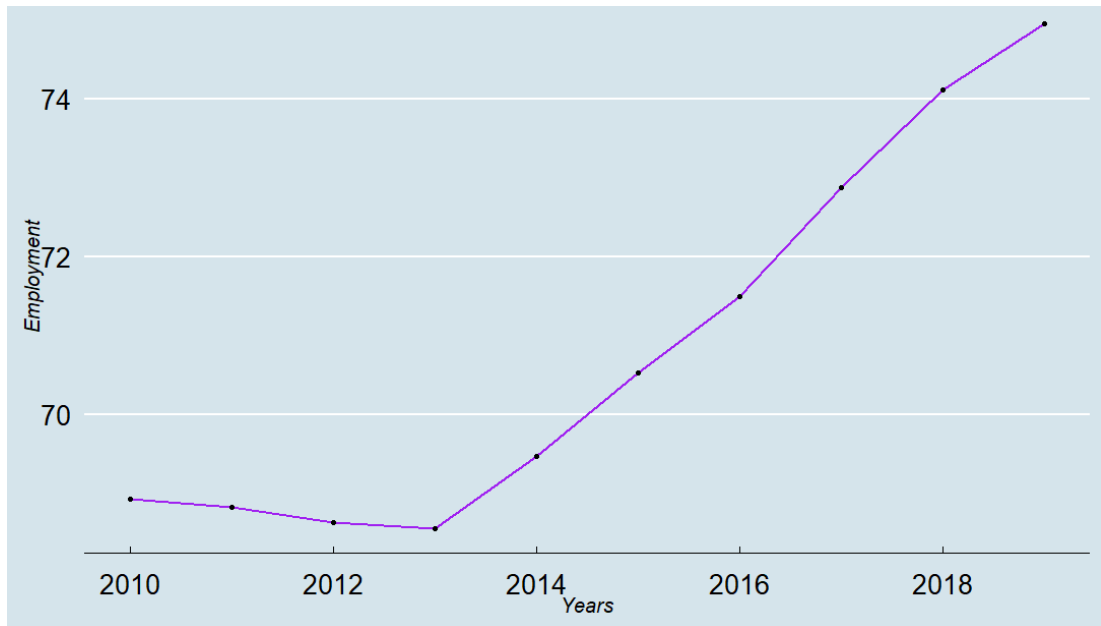


Figure 3.5: The rate of average overall employment for Europe

As shown in Figure 3.6 and Figure 3.7 unlike employment rates in Turkey, Europe's female employment and male employment has been on the same trend through the ten years studied in this paper. And employment has been steadily growing since 2013 after three years of stable path.

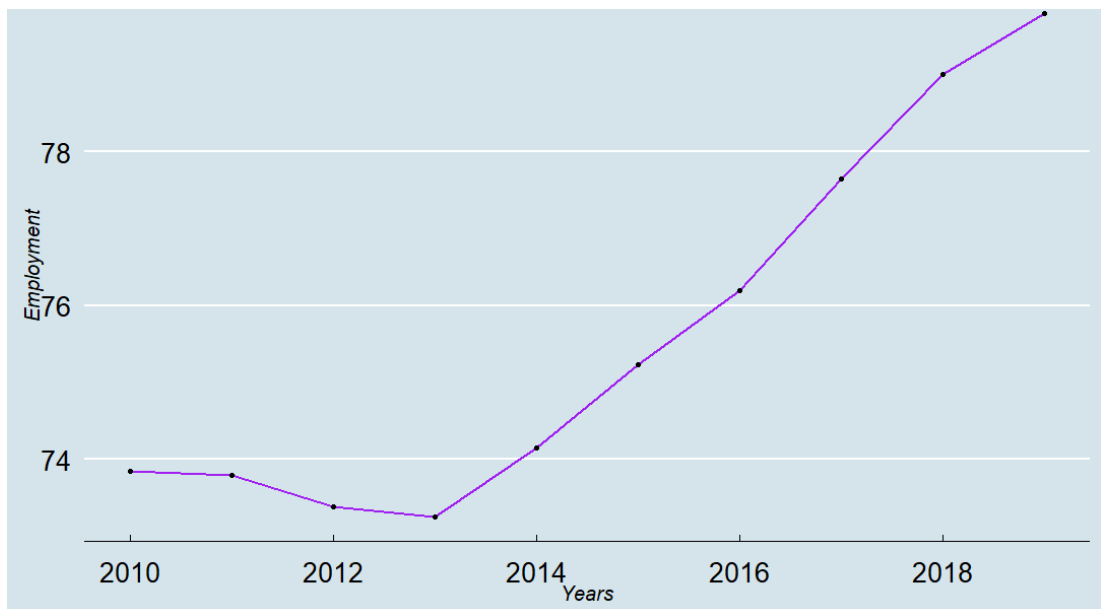


Figure 3.6: Male employment rate average for Europe

According to the data collected from the EU Statistics Office (Eurostat) for this study, northern European countries are at the top of the women's employment table. The average of 28 EU countries was around 70 percent in 2019. Female employment rate in Europe, compared to Turkey, is very high and steadily increasing.

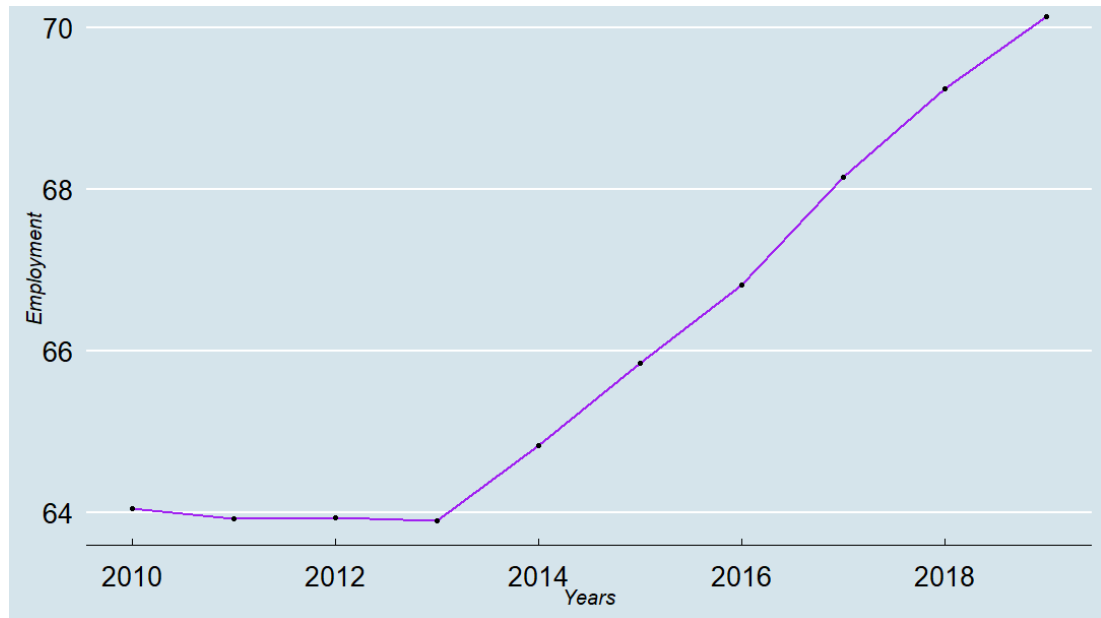


Figure 3.7: Female employment rate average for Europe

To further decompose the employment rate, Figure 3.8 demonstrates the average employment rates in industry, agriculture and services for Europe. Unlike what is seen in the graph for employment in sectors of the Turkish economy, Figure 3.8 shows that there is a steady trend in all the three sectors with only a slight fall in agriculture. Since the fall in employment agriculture is seen in both Turkey and Europe, we are yet to see how much of the decrease is explained by immigrant inflow.

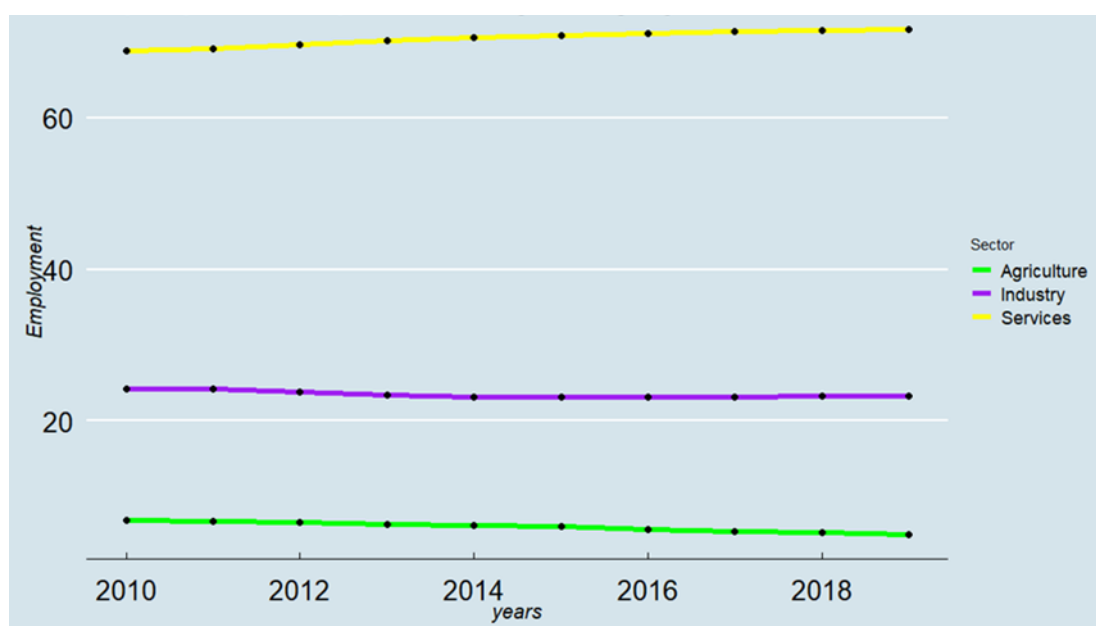


Figure 3.8: The average rate of employment by sectors for Europe

3.2 Unemployment:

The unemployed are groups of people in their working age who are without work but are available for work, and have taken specific steps to find work. The uniform application of this definition results in estimates of unemployment rates that are more internationally comparable than estimates based on national definitions of unemployment. This indicator is measured in numbers of unemployed people as a percentage of the labour force and it is seasonally adjusted. The labour force is defined as the total number of unemployed people plus those in employment (OECD, 2021).

According to Turkish Statistical Institute, out of the unemployed people within the reference term (people who have not worked with/without salary or daily wage or a profit sharing scheme and have no connection with such a job), those who have used at least one of the job seeking channels in the last three months and are available to start working in 15 days are included in the unemployed population on the condition that they are in non-corporate working age (TURKSTAT, 2021).

Unemployment in Turkey

According to the data collected from the EU Statistical Institute (Eurostat), Turkey is one of the top three countries in Europe in the rate of unemployment. The average of European Union countries was 6.11 percent. Only Greece and Spain rank above Turkey on the table of unemployment rate. Turkey ranks third with 12.1%. Turkey, after scoring a single digit unemployment rate between 2011 and 2014, seems to have a continuously increasing rate of unemployment. As shown in figure 3.9 the increase after 2018 was in a much higher rate than the years before.

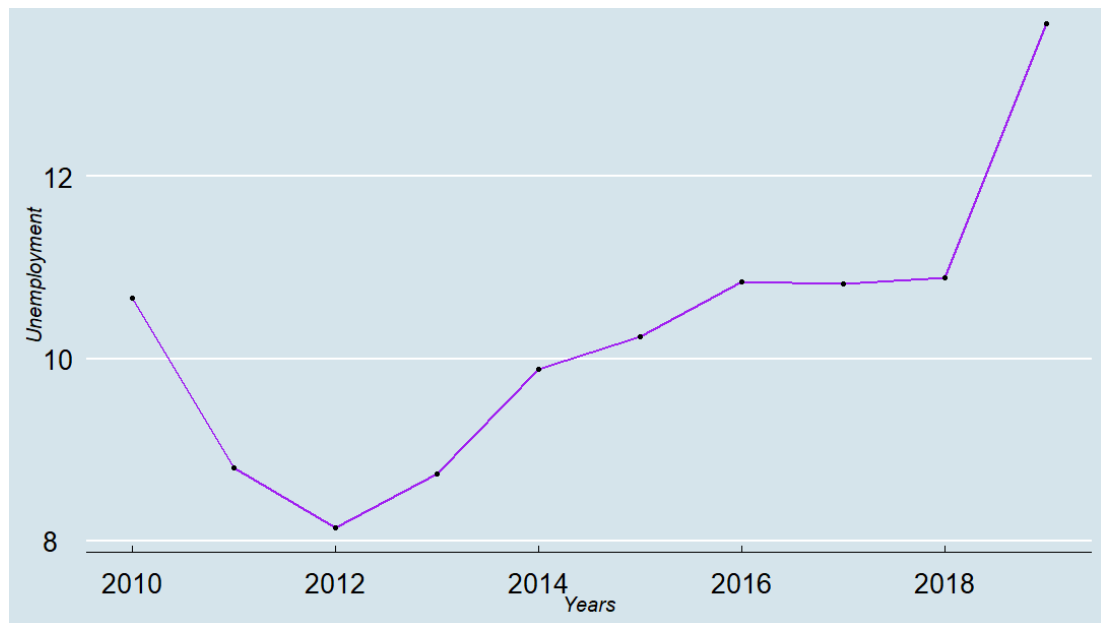


Figure 3.9: The rate of overall unemployment for Turkey

As the level of education increases in European countries, the unemployment rate decreases. The only exception to this is Turkey. Turkey is the only country among 35 countries in Europe where the unemployment rate among higher education graduates is higher than that of primary education graduates. Again, the country with the lowest unemployment rate difference between the two graduate groups is Turkey (figure 3.10).

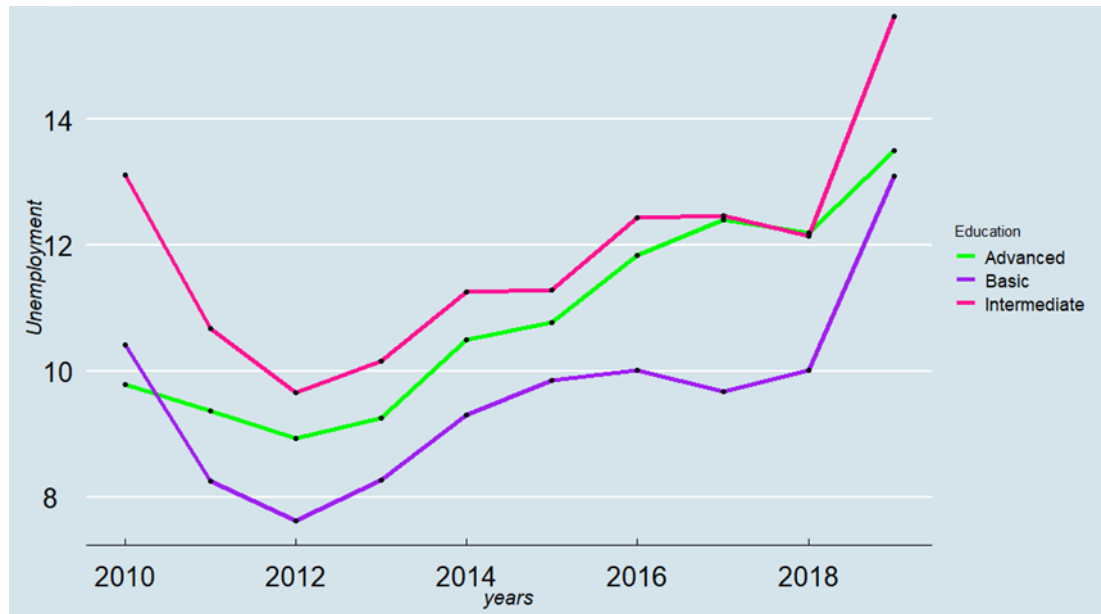


Figure 3.10: The rate of unemployment by education for Turkey

Unemployment in Europe

Unemployment rate in European countries tends to decrease gradually after peaking in the year 2013. Figure 3.11 demonstrates that following the year 2013, the rate falling sharply reaching an average annual rate of 6.11 in the year 2019.

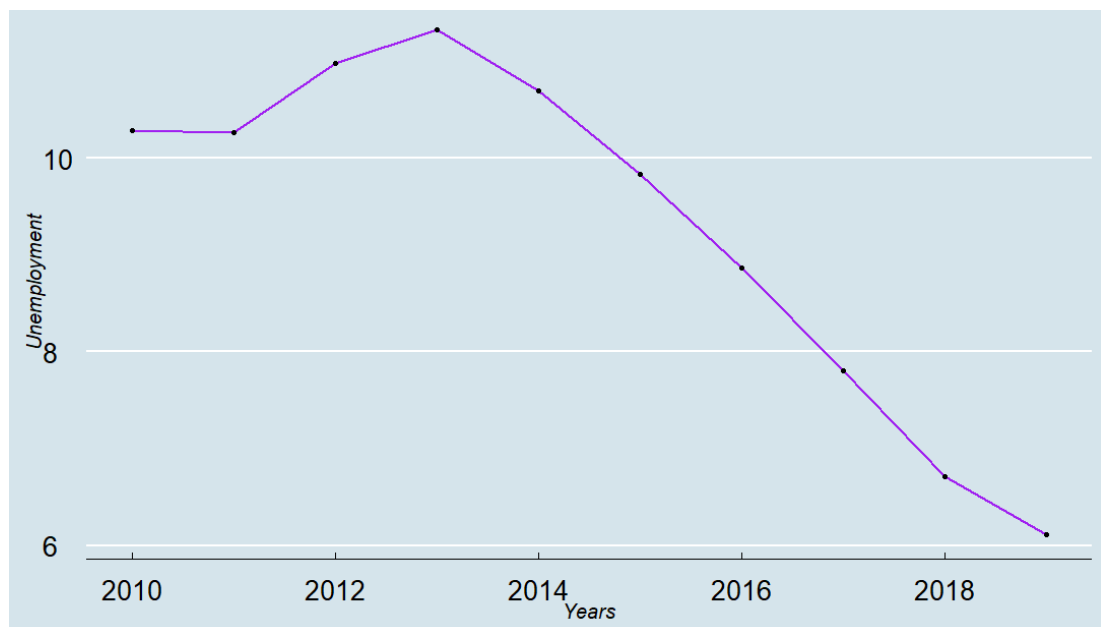


Figure 3.11: The rate of average overall unemployment for Europe

In European countries, unlike Turkey, the unemployment rate decreases as the level of education increases. As shown in Figure 3.12, the gap between the unemployment of workers with advanced education and workers with basic education is wide.

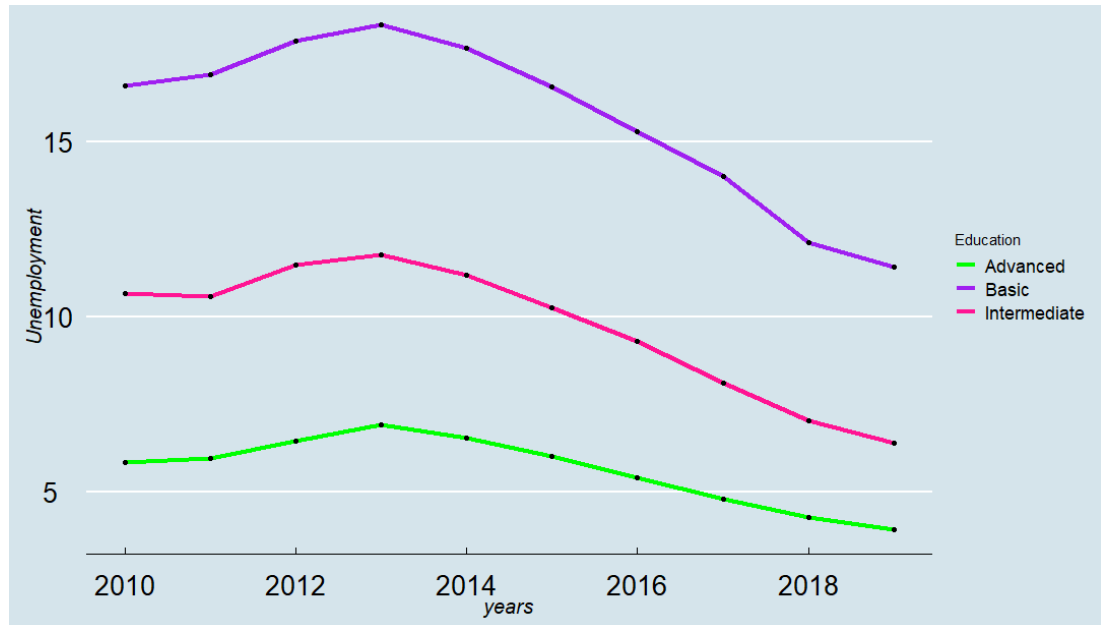


Figure 3.12: The average rate of unemployment by education for Europe

3.3 Net Migration Rate:

The net migration rate (NMR) of a population, which is obtained from Macrotrends LLC (which uses United Nations - World Population Prospects as data Source) is defined as the difference between the number of immigrants arriving at a destination per 1,000 population at that destination in a given year and the share of the native population of a specific country residing abroad at a given time.

Net Migration in Turkey

After showing a drastic increase between the years 2010 and 2014 which fall up on the beginning years of the Syrian conflict, the immigrant inflow to Turkey has decreased in a very lower rate than the increase rate. This fall in the net migration was sharper after 2018 (Figure 3.13). By then, the Syrian conflict was in its final phase and less complicated. The relation between this increase and fall in rate of migration and the simultaneous increase and fall in the rate of employment will be studied in the next chapter.

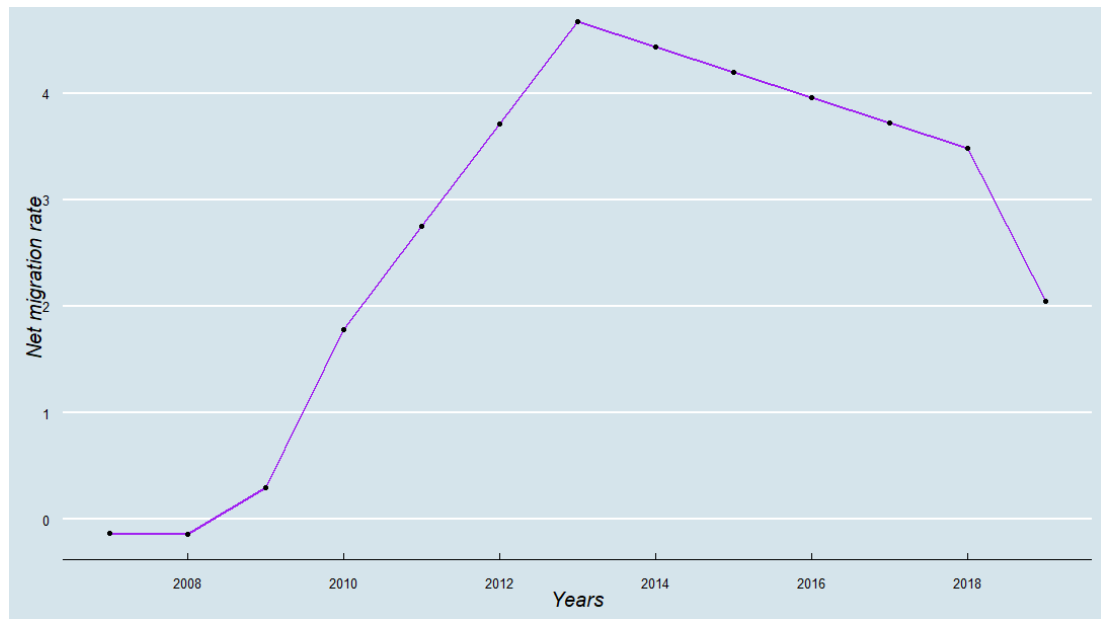


Figure 3.13: The rate of net migration for Turkey

Net Migration in Europe

In the years between 2010 and 2013 a sharp decrease in the average rate of net migration to Europe can be seen from figure 3.14. however, by the year 2018 the rate had almost risen to its place before 2010. The rise in the rate of net migration came three years behind Turkey. This lag could be the result of geographical location of Europe and Turkey; Turkey was one of the first destination migrants would apply, both because of its geographical location and also due to the political environment in the country.

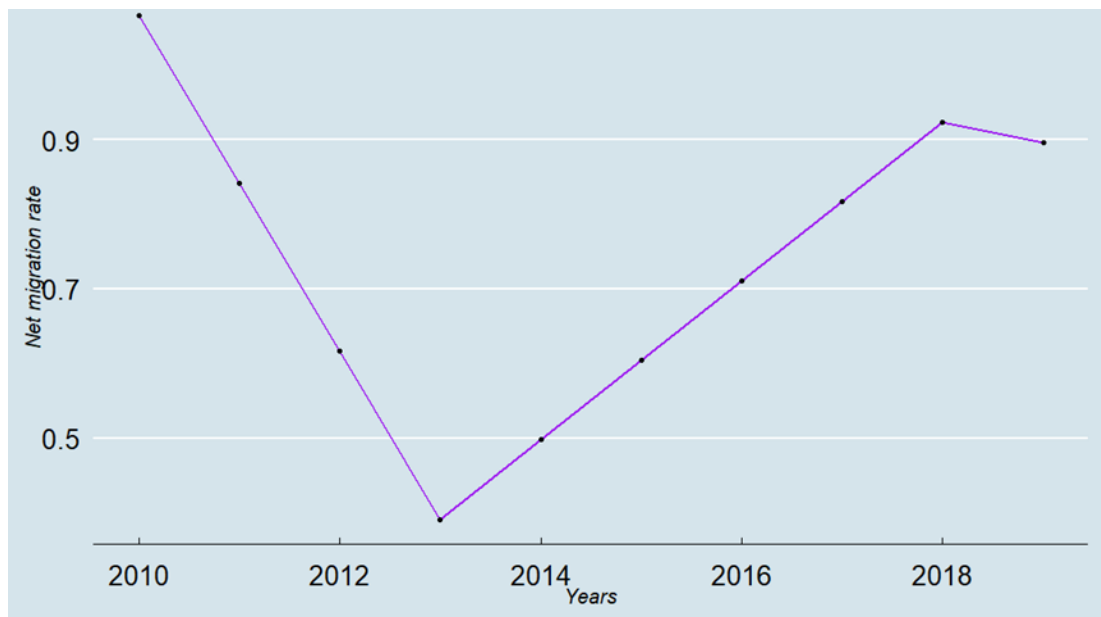


Figure 3.14: The average rate of net migration for Europe

IV. EMPIRICAL EVIDENCE

This chapter consists of two main sections. First, we describe the theoretical mechanisms by which a job supply shock triggered by immigration can affect the labor market. Second, we discuss and present the empirical results.

4.1 Estimation Methods Used

This section describes the identification strategy and econometric model that is employed in the paper in order to estimate the labor market impact of migration in Turkey and Europe. The equation used for this purpose is

$$y_{i,t} = \alpha + \beta_i X_{i,t} + u_{i,t} \quad (4.1)$$

For male employment, Model 1:

$$EMPM_{i,t} = \alpha + \beta_1 NMR_{i,t} + \beta_2 GDPP_{i,t} + u_{i,t} \quad (4.2)$$

For female employment, Model 2:

$$EMPF_{i,t} = \alpha + \beta_1 NMR_{i,t} + \beta_2 GDPP_{i,t} + u_{i,t} \quad (4.3)$$

For total employment, Model 3:

$$EMPT_{i,t} = \alpha + \beta_1 NMR_{i,t} + \beta_2 GDPP_{i,t} + u_{i,t} \quad (4.4)$$

$i = 1, \dots, N$; $t = 1, \dots, T$.

where $EMP_{i,t}$ is the labor market outcome represented by Employment rate for country i , in year t . The main independent variable of interest is the net migration rate $NMR_{i,t}$ for each country i , in a particular year t . Per capita gross domestic product $GDPP_{i,t}$, is the second independent variable used in our three models.

In panel data econometrics, a standard one-way model of error components generally applies:

$$u_{it} = \mu_i + v_{it} \quad (4.5)$$

Here, μ_i time-invariant and stands for any individual or country-specific unobserved effect which is not included in the regression. While v_{it} denotes regression residuals. These residues are assumed to be white noise series. In vector form (4.1) can be written as

$$EMPM = \alpha_{INT} + \beta NMR + \beta_2 GDPP + u = Z\delta + u \quad (4.6)$$

Pooled Least Squares Model (Pooled OLS, POLS)

Pooled OLS model is a model where the data on different units are pooled together with no assumption on individual differences. Some assumptions will be made while estimating POLS. First, independent and identical cross-sectional observations $\{(X_i, y_i): i = 1, 2, 3, \dots, N\}$ are assumed where X_i is $T \times K$; y_i is $T \times 1$ dimensional matrices. Thus, y_i includes the dependent variables for all T equations. The matrix X_i contains independent variables. The multivariate linear model can be written as:

$$y_i = \beta X_i + u_i \quad (4.7)$$

β is a $K \times 1$ dimensional vector, and u_i is a $T \times 1$ dimensional vector of unobservable values.

In order for the POLS model to be consistent, the following orthogonality condition must be met: $E(\sum_t x'_{it} u_i) = 0 \quad t = 1, 2, \dots, T$. The POLS model assumes that x_{is} can be related to u_{it} when $t \neq s$. This means that x_{it} 's simultaneous exogeneity assumption is valid instead of strict exogeneity. In order for the POLS estimator to be consistent, the rank condition must also be met. It must have K rank and $E((X'_i X_i))$ and must be nonsingular. In this case, β should be estimated as:

$$\beta = E[(X'_i X_i)]^{-1} E(X'_i y_i) \quad (4.8)$$

In order for POLS to be consistent, no form errors should be made along with the rank condition. Regression (4.7) will be estimated with POLS. When making this estimation, it will be assumed that there are no unit-specific (country-specific in this study) unobservable effects ($\mu_i = 0, i = 1, 2, 3, \dots, N$). In this case, the regression (4.7) would be:

$$y_i = \alpha + \beta X_{it} + v_i \quad i = 1, 2, \dots, N; \quad t = 1, 2, \dots, T \quad (4.9)$$

If there are no unobservable effects between countries, the error term will have v_{it} white noise. Therefore, the problem of serial dependency will not be encountered. On the other hand, if the country-specific unobservable effects are different from zero ($\mu_i \neq 0$), the regressions of these countries will be μ_i and this will lead to the problem of cascading dependency.

When the assumption of $E(x'_{it} u_i) = 0$ is met in POLS, it will be automatically provided under the following two conditions:

$$E(X'_{it} v_{it}) = 0 \text{ and } E(X'_{it} \mu_i) = 0 \quad t = 1, 2, \dots, T \quad (4.10)$$

The Fixed Effects Model (FE)

In the fixed effect model, μ_i is assumed to be constant across cross-section units and it is assumed that these unobservable effects could be related to explanatory variables. On the other hand, the error terms v_{it} with the explanatory variables are assumed to be unrelated and v_{it} is assumed to be an independent and identical (IID(0, σ_v^2)) error term that fits the stochastic distribution. X_{it} is assumed to be independent of v_{it} for all i and t . Therefore, the assumption of absolute externality is valid on the unobservable effects of the explanatory variables in the FE model. $E(v_{it} | X_i, \mu_i) = 0$ for $t = 1, 2, 3, \dots, T$. On the other hand, in the FE model, $E(\mu_i | X_i) \neq 0$, that is, the assumption of the relationship between independent variables and unobservable effects is valid. this assumption makes the effects of time-independent variables associated with independent variables measurable.

The FE model is suitable for studies on N-numbered companies or country groups. It is obtained by substituting the equation $u = Z_\mu \mu + v$ into equation (4.1).

$$y = \alpha_{INT} + X\beta + Z_\mu \mu + v = Z\delta + Z_\mu \mu + v \quad (4.11)$$

In the FE model, unobservable individual effects are eliminated by subtracting their time averages from the variables. This is called a “fixed effects transformation” or “within transformation” (Wooldridge, 2002).

If (4.11) is multiplied by the transform matrix, the transformed model is obtained:

$$Qy = QX \beta + Qv \quad (4.12)$$

The Q matrix transformation process is as follows: When $PZ_{\mu} = Z_{\mu}$, then $QZ_{\mu} = Q_{INT} = 0$. The Q matrix eliminates individual effects. With $\tilde{y} = Qy$, $\tilde{X} = QX$, $\tilde{v} = Qv$, we get the regression of $\tilde{y} = \tilde{X}\beta + \tilde{v}$. If OLS is applied to this transformed model, it returns the value of $\tilde{\beta}_{FE}$. The result of the OLS estimator is as follows:

$$\tilde{\beta} = (X'QX)^{-1}X'Qy \quad (4.13)$$

The variance of the coefficient $\tilde{\beta}$ is equal to:

$$\text{Var}(\tilde{\beta}) = \sigma_v^2 (X'QX)^{-1} = \sigma_v^2 (\tilde{X}'\tilde{X})^{-1} \quad (4.14)$$

if time averages are taken out of a simple regression;

$$y_{it} = \alpha + \beta x_{it} + \mu_i + v_{it} \quad (4.15)$$

We get;

$$\bar{y}_i = \alpha + \beta \bar{x}_i + \mu_i + \bar{v}_i \quad (4.16)$$

Subtracting (4.16) from (4.15) gives the following result:

$$y_{it} - \bar{y}_i = \beta(x_{it} - \bar{x}_i) + (v_{it} - \bar{v}_i) \quad (4.17)$$

The average of all the observations in (4.14) gives us the following result:

$$\bar{y}_{..} = \alpha + \beta\bar{x}_{..} + \bar{v}_{..} \quad (4.18)$$

The FE model transforms to eliminate unobservable country-specific effects. However, country-specific unobservable effects can be found using the $\tilde{\beta}$ value from the transformed regression. μ_i values can be found by using the equation $\mu_i = \bar{y}_i - \bar{x}_i \tilde{\beta}$ for $i = 1, 2, 3, \dots, N$. One shortcoming of the FE model using within transformation is that cannot predict time-independent variables (such as gender, race, creed, school or union participation). These variables are removed from the model with the Q converter (Baltagi B. , 2005).

Another way to deal with the fixed effects is to use the least squares dummy variables (LSDV) method.

However, this technique which is also noted as FE-OLS model is not preferable as it causes a huge loss in the degrees of freedom. This is because as N gets larger, introducing large number of dummy variables consumes the degrees of freedom very quickly.

The Random Effects Model (RE)

A random-effects model assumes that explanatory variables have fixed relationships with the dependent variable across all observations, but these fixed effects may vary from one observation to another. In other words, the shortcomings of the fixed effects models are eliminated by random selection of unobservable effects, μ_i . In this case, μ_i and v_{it} have the following independent and identical distributions: $\mu_i \sim \text{IID}(0, \sigma_\mu^2)$ and $v_{it} \sim \text{IID}(0, \sigma_v^2)$ where

μ_i are independent of v_{it} . The notation of this expression is as follows:

$$E(u_{it} | X_i, \mu_i) = 0, t = 1, 2, \dots, T;$$

$$E(\mu_i | X_i) = E(\mu_i) = 0 \text{ while } X_i \equiv (X_{i1}, X_{i2}, \dots, X_{iT}).$$

With this structure, the RE model includes unobservable effects in the model and there are two components in the composite error term: $u_{it} = \mu_i + v_{it}$. Due to this structure of the error term of the model, the RE model is also called the error components model. In the random effects model, the absolute externality assumption must be valid for the estimations to be consistent. $E(u_{it}|X_{it}) = 0$, $t = 1, 2, \dots, T$. The strict externality assumption means that the explanatory variables and the compound error term and the terms μ_i and v_{it} are unrelated for past, present, and future periods.

However, random effects estimation techniques have its own challenges. The RE model brings the problem of serial correlation due to the structure of the composite error term. The problem of cascading dependency arises due to the nature of the compound error term. Unobservable effects (μ_i) are the same for units (countries) and do not change with time. The RE model, in the composite error term $u_{it} = \mu_i + v_{it}$ solves the cascade dependency problem by performing a GLS transformation.

Moreover, the random effects model is a suitable estimation method if we randomly select N units from a large population. Within the scope of this study, this means the following: There is no relationship between country-specific factors that are constant over time, such as the country's religious structure, management style, geographical features and the growth of the country's economy. Thus, within the scope of this study, the FE model, which allows for the relationship between X_{it} and μ_i , seems to be a more realistic model than the RE method, which rejects the relationship between X_{it} and μ_i . (Baltagi B. , 2005).

The Hausman Test for Endogeneity (Hausman Specification Test)

As mentioned above, there is an important assumption in the error component regression model which is the following orthogonality condition: $E(u_{it} | X_{it}) = 0$. But if the error terms contain unit-specific unobservable effects (μ_i), which are related to the explanatory variables, in this case, if $E(u_{it} | X_{it}) \neq 0$ and the GLS estimator $\hat{\beta}_{GLS}$ will become biased and inconsistent estimator for the coefficient β . In this case, the fixed effects model, using the within transformation ($\hat{\beta}_{Within}$), eliminates unobservable effects specific to these units and predicts β as unbiased and consistent. Based on this

distinction, Hausman tries to compare $\hat{\beta}_{GLS}$ with $\hat{\beta}_{Within}$ with his test named after himself. The H_0 hypothesis of the Hausman test consistently assumes both estimators, $\hat{\beta}_{GLS}$ and $\hat{\beta}_{Within}$ are consistent.

However, the assumption of $H_0: E(u_{it} | X_{it}) = 0$ is valid and the $\hat{\beta}_{Within}$ estimator is consistent regardless of whether H_0 hypothesis is not rejected in the test. If H_0 hypothesis is not rejected, the RE estimator $\hat{\beta}_{GLS}$ preserves the BLUE assumption whereas if H_0 is rejected, $\hat{\beta}_{GLS}$ will be inconsistent. The Hausman test statistic is obtained from the equation $\hat{q}_1 = \hat{\beta}_{GLS} - \hat{\beta}_{Within}$. In the H_0 hypothesis, $\text{plim } \hat{q}_1 = 0$ and $\text{cov}(\hat{q}_1, \hat{\beta}_{GLS}) = 0$ (Wooldridge, 2002).

The Hausman test can also be described as a test of model misspecification. Practically, the Hausman test is used in choosing between the fixed effects model (FE) or the random effects model (RE). The null hypothesis H_0 suggests that the random effects model (RE) should be the preferred model; The alternate hypothesis is that the model that should be used is the fixed effects model (FE). Basically, the Hausman test checks whether there is a correlation between the unique errors and the regressors of the model used. The null hypothesis is that there is no correlation between unique errors and the regressors (Baltagi B. , 2005).

4.2.Results And Discussion

In this section, the estimation results obtained by using the panel data analysis of 30 countries' employment and migration dataset will be presented. The main objective of this study is to estimate the effect of migration on the employment of locals in Turkey and 29 countries from the European Union.

Before, estimating the model, the diagnostics of the given data is investigated. This analysis starts first by testing the existence of cross-section dependence. The reason behind starting with the cross-section dependency test is to examine the impact of the shock effect in one of the countries that make up the panel on other countries. Especially under today's conditions, with the globalization of the countries in the world, it seems unlikely that a shock occurring in one country will not affect other countries that are in interaction with each other. Therefore, testing the existence of cross-sectional dependence in the countries first when starting the analysis allows the analysis to be more consistent. There is a high probability of cross-sectional dependence between countries that are in close interaction with each other and that are

members of the same economic or political integration. While checking the cross-section analysis, if the time dimension is greater than the cross-section dimension ($T > N$) the Lagrange Multiplier (LM) test suggested by (Breusch & Pagan, 1980), The Pesaran (2004)) Cross-section Dependence (CD), on the other hand, provides a more flexible use. Because it offers the possibility of use both when the time dimension is larger than the cross-section dimension ($T > N$) and when the cross-section dimension is larger than the time dimension ($N > T$). Pesaran's cross sectional independence test gives the result of $Z = 48.876$ and with probability- value far less than 0.05, it is seen that the H_0 hypothesis that there is cross-section dependency in the model is rejected. Therefore, for our data generating process, there is no evidence of cross-section dependency among the countries. The result of the analysis, which means that a shock in one of the countries is not effective on other countries, meets the expectations when the data set is taken into account.

The next test applied is the Hausman test to determine which panel data model fits our dataset. Although the results for most of the models accept the null hypothesis, Some of the test results fail to reject the null hypothesis that suggests Random effects model fits our dataset best. Although the Hausman Test suggest that random effect is not invalid for the dataset used in this study, fixed effect model was preferred. The reason for this is that the sample is not randomly selected from a population but represents the whole population itself (exhaustive sampling). The Hausman test results are displayed below in Table 4.1.

Model	chisq	p-value
Employment		
in agriculture, female	9.1535	0.0273
male	2.2173	0.5286
industry, female	25.026	<0.001
male	135.72	<0.001
services, female	71.829	<0.001
male	32.629	<0.001
Unemployment		
(advanced education) female	2.3665	0.4999
male	92.061	<0.001
basic education, female	145.26	<0.001
male	2.6635	0.4465
intermediate education, female	5.4639	0.1408
male	37.007	<0.001
Unemployment		
female	10.323	0.0160
male	8.925	<0.001

Table 4.1: Hausman test results

Thus, to reveal the impact of migration on the labor markets of Turkey and Europe in the years 2010-2019, we estimate several models by using fixed effects estimation method. The model estimation results are presented in tables listed below.

Interesting outcomes follow from the estimations. In the literature review section, it was stated that Carrasco et al (2005) find negative but statistically insignificant impacts of migration on the employment rate of native workers when considering total migration. The results of the regression analysis made for this study on the impact of migration on the employment of male and female workers shown in Table 4.2 exactly matches the results of Carrasco et al (2005)'s study.

Coefficient	Employment					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	0.2	-0.06 – 0.46	0.13	0.18	-0.01 – 0.38	0.06
Population(15-64)	-2.09	-2.37 – -1.82	<0.001	-2.13	-2.33 – -1.93	<0.001
GDP per capita	0.15	0.11 – 0.19	<0.001	0.06	0.03 – 0.10	<0.001
Observations	270			270		
R2 / R2 adjusted	0.599 / 0.550			0.696 / 0.660		

Table 4.2: Fixed effects model estimation for employment by gender

The model estimated for the relationship between unemployment rates with net migration displayed in Table 4.3 also shows similarity with studies of Boubtane et al. (2013), Bonin (2005) and Docquier et al. (2011) which found that there was no significant effect of migration on the unemployment rate of locals. This study also finds a positive change in employment of locals even though these changes are statistically insignificant.

Coefficient	Unemployment					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	-0.16	-0.41 – 0.09	0.217	-0.21	-0.44 – 0.01	0.061
Population(15-64)	1.65	1.35 – 1.94	<0.001	1.31	1.06 – 1.56	<0.001
GDP per capita	-0.15	-0.19 – -0.11	<0.001	-0.09	-0.13 – -0.05	<0.001
Observations	250			250		
R2 / R2 adjusted	0.526 / 0.468			0.465 / 0.400		

Table 4.3: Fixed effects model estimation for unemployment by gender

Moreover, to get a deeper understanding of how migration impacts the labor markets of the host countries the analysis was expanded to see if effect show variation depending on sectors and education levels of the host countries laborers. Unemployment of female workers with intermediate education and unemployment of female workers with advanced education significantly decrease with an increase in net migration. But unemployment of female workers with basic education was not significantly affected by migration. This result shows similarity to the study of Del-Carpio and Wagner (2015) are displayed in Table 4.4, Table 4.5, and Table 4.6

Coefficient	Unemployment with advanced education					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	-0.07	-0.24 – 0.09	0.372	-0.21	-0.38 – -0.04	0.014
Population(15-64)	0.74	0.56 – 0.93	<0.001	0.74	0.55 – 0.93	<0.001
GDP per capita	-0.07	-0.10 – -0.05	<0.001	-0.05	-0.08 – -0.03	<0.001
Observations	249			250		
R2 / R2 adjusted	0.373 / 0.296			0.352 / 0.274		

Table 4.4: Fixed effects model estimation for unemployment with advanced education

Coefficient	Unemployment with intermediate education					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	-0.18	-0.44 – 0.08	0.174	-0.28	-0.54 – -0.02	0.036
Population(15-64)	1.65	1.35 – 1.95	<0.001	1.43	1.14 – 1.72	<0.001
GDP per capita	-0.17	-0.21 – -0.13	<0.001	-0.12	-0.16 – -0.07	<0.001
Observations	250			250		
R2 / R2 adjusted	0.540 / 0.484			0.465 / 0.400		

Table 4.5: Fixed effects model estimation for unemployment with intermediate education

Coefficient	Unemployment with basic education					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	-0.31	-0.72 – 0.09	0.132	-0.24	-0.60 – 0.13	0.202
Population(15-64)	2.31	1.84 – 2.78	<0.001	1.54	1.13 – 1.94	<0.001
GDP per capita	-0.23	-0.30 – -0.16	<0.001	-0.15	-0.21 – -0.09	<0.001
Observations	250			250		
R2 / R2 adjusted	0.484 / 0.422			0.355 / 0.277		

Table 4.6: Fixed effects model estimation for unemployment with basic education

When it comes to the employment by sectors, the test results displayed in Table 4.7 point out that migration had a significant impact only the employment rate of female workers in industry. Employment of women in industry is seen to fall with an increase in immigrant inflow. On the other hand, the employment in agriculture and services for both genders and employment of men in industry are not significantly affected by migration. (Table 4.7, Table 4.8, and Table 4.9)

Coefficient	Employment in agriculture					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	0	-0.12 – 0.11	0.935	0.01	-0.19 – 0.21	0.938
Population(15-64)	0.49	0.36 – 0.62	<0.001	0.59	0.37 – 0.82	<0.001
GDP per capita	-0.03	-0.04 – -0.01	0.006	-0.02	-0.05 – 0.01	0.234
Observations	250			250		
R2 / R2 adjusted	0.263 / 0.173			0.134 / 0.028		

Table 4.7: Fixed effects model estimation for employment in agriculture

Coefficient	Employment in industry					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	0.04	-0.09 – 0.17	0.564	0.07	0.01 – 0.14	0.018
Population(15-64)	0.49	0.34 – 0.64	<0.001	0.17	0.11 – 0.24	<0.001
GDP per capita	0.08	0.05 – 0.10	<0.001	0.01	-0.00 – 0.02	0.053
Observations	250			250		
R2 / R2 adjusted	0.282 / 0.195			0.139 / 0.035		

Table 4.8: Fixed effects model estimation for employment in industry

Coefficient	Employment in services					
	Male			Female		
	Est.	Conf. Int (95%)	P-Val	Est.	Conf. Int (95%)	P-Val
Net Migration	-0.03	-0.18 – 0.12	0.661	-0.08	-0.28 – 0.12	0.421
Population(15-64)	-0.97	-1.15 – -0.80	<0.001	-0.77	-0.99 – -0.54	<0.001
GDP per capita	-0.05	-0.07 – -0.02	<0.001	0.01	-0.02 – 0.04	0.544
Observations	250			250		
R2 / R2 adjusted	0.367 / 0.290			0.186 / 0.087		

Table 4.9: Fixed effects model estimation for employment in services

V. CONCLUSION

Although there are many reasons why people move from one country to another, economic factors and political factors are considered to be two of the most basic and general reasons. For example, immigrants migrate to have a better standard of living, to find better jobs, to achieve higher levels of welfare and improve their quality of life, to flee prosecution or war. While benefiting from the better opportunities they are offered after arriving to the host nation, international migrants can unfortunately sometimes encounter discrimination and racism. The main reason that creates an environment of hostility towards foreigners is the claim that migrants take jobs from local workers and are preferred by employers due to their lower wage demand.

The literature shows that migration's impact on the labor market hosting nation is dependent on mainly skills of both migrants and natives and the economic structure and characteristics of the hosting nation. It has been also pointed out that, the impact of migration is prone to vary between the long term and short term because the market can adjust to the increase in the supply of labour.

The data of migration and employment indicators were analyzed using Panel data models which provide the researcher with a wide range of possibilities combining both the indicators data and time series data (the ten years covered by this study) . Panel data helped in working with increased number of observations and the degrees of freedom. The estimates obtained by decreasing the multicollinearity between the variables were more effective and reliable.

Overall, this thesis provides suggestive evidence to state that migration *per se* does not provide a unique identifier for the changes in the unemployment and employment dynamics of the host country. As it was seen in the studies mentioned in the literature review and pointed out in this study also, the impact of migration is prone to vary depending on skills of both migrants and natives and the economic structure and characteristics of the hosting nation. The effect can also show variation among different sectors in the economy.

APPENDIX

Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 75	Max
Unemployment, male	270	9.315	4.646	2.759	6.066	11.083	25.598
female	270	9.414	5.388	2.537	5.677	11.577	31.392
Unemployment (advanced education) female	250	6.338	4.631	1.36	3.347	7.632	24.49
male	249	5.356	3.004	1.17	3.27	6.69	16.98
basic education, female	250	15.464	7.528	3.53	9.767	19.985	36.26
male	250	15.507	7.005	4.36	10.023	18.67	42.38
intermediate education, female	250	10.545	6.749	2.3	5.633	13.315	37.03
male	250	9.284	5.163	2.11	5.488	10.95	26.39
Employment in agriculture, female	250	5.644	7.892	0.63	1.46	5.305	39.27
male	250	7.66	5.369	1.17	3.835	10.5	29.95
industry, female	250	12.422	4.759	6	8.425	16.085	25.09
male	250	33.164	5.477	19.93	29.152	37.022	45.64
services, female	250	81.936	10.805	44.85	78.157	89.845	92.64
male	250	59.178	7.972	35.08	54.168	65.798	72.73
Net migration rate	270	0.838	4.059	11.595	-1.327	3.962	8.797
GDP per capita	270	96.504	32.487	44	69	124	193
Population ages 15-64 female	270	6288936	8014484	104776	1424182	6458703	28157379
male	270	6276147	7972974	108792	1420393	6555487	27726247

Appendix 1: Summary statistics for variables used in the study

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