

The Impact of Syrian Refugees on the Labor Market Outcomes of Natives in Turkey

by

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Abstract

Syria's civil war has resulted in a forced displacement of over 5.5 million Syrian refugees to neighboring countries. Turkey has ranked the first among neighboring countries (including Lebanon, Jordan, Iraq and Egypt) by receiving more than 3.5 million Syrians by the end of May 2019. The massive inflow of the refugees has led to economic and political challenges in the country. In this paper, the impact of forced migration of Syrians on Turkish natives' labor market outcomes is estimated by using regional panel data including twenty six subregions classified by NUTS-2. The empirical findings indicate that Syrian refugees have an adverse effect on Turkish natives' informal employment. In other words, Turkish workers have been displaced by Syrian refugees in the informal sector. On the other hand, the refugee influx is found to have a positive impact on Turkish workers' formal employment while there is no statistically significant effect of Syrian refugees on Turkish citizens' unemployment.

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1. Introduction

The Syrian civil war started in 2011 has led to a forced migration by displacing more than 5.5 million Syrians to neighboring countries (UNCHR, 2019a). Such a massive immigration of Syrian refugees has imposed several economic and political challenges on hosting countries. Turkey has ranked the first among neighboring countries (including Lebanon, Jordan, Iraq and Egypt) by receiving the highest number of Syrian refugees. According to United Nations High Commissioner for Refugees (UNCHR), the number of Syrian refugees in the country was more than 3.5 million by May 2019. At the beginning of their arrival, Syrians were mainly located in the refugee camps constructed in the provinces close to the border of Syria and in time, they started to leave the refugee camps. Although some of the refugees have relocated to bigger provinces of the country such as Konya, İzmir and İstanbul, the majority of them have settled primarily in the provinces of the southeastern region where the camps are located (DGMM, 2019).

Since the Syrian war was not expected to go on for a long time, the refugee inflow into the country was considered a temporary phenomenon. Thus, the Turkish government has focused primarily on meeting the immediate needs of the refugees by providing public services consisting of education, food, and health but did not take any steps regarding legal employment opportunities until 2016. Syrian refugees were not able to work formally in the first five years of their arrival and in 2016 they were granted work permits. However, since they had to earn their living during these five years, the majority of them started to participate in the informal sector. Thus, the refugee inflow has been a labor supply shock in the informal sector. Several studies claim that Syrian refugees have supplied cheap labor by working in the informal jobs with relatively lower wages for long working hours in comparison to natives (Kirişçi, 2014; Lordoğlu

and Aslan, 2015; Ferris and Kirişçi, 2016). Therefore, the cheap labor provided by the refugees has created an intense competition among Syrians and natives in the informal job markets and hence public concern and debate among local people indicating that the refugees are taking the natives' jobs. The aim of this study is to make a contribution to this debate by analyzing the impact of forced and massive migration of Syrian refugees on the Turkish citizens' labor market outcomes including unemployment, formal employment and informal employment.

Standard theoretical framework suggests that migrants lead to an increase in the labor supply and hence labor market competition. As a consequence, employment and wages of native workers are expected to decrease. In other words, migration has an adverse effect on the labor market. However, early studies estimating the effect of migration on labor market outcomes of native workers are less likely to find sizeable effect on employment or wages of native workers (Card, 1990; Hunt, 1992; Friedberg, 2001). There can be several reasons of missing impacts of migration on labor markets. One possible explanation is the poor substitutability of immigrants and native workers due to the difference in human capital. Moreover, immigrants might have difficulty in integration into labor markets at least in the short term due to language barriers and cultural difference. Another reason is that migration might lead to change in capital flows, internal migration pattern and these changes can dampen the migration effect on local labor markets. Furthermore, throughout history, different types and magnitude of migration has taken place and led to different consequences in hosting countries. Unlike forced migration, in the case of voluntary migration, migrants are more likely to settle in regions that offer better employment opportunities as they tend to take into consideration economic conditions of their destination and this might lead to biased estimation. Thus, this selection bias is required to be taken into consideration while analyzing the labor market impacts of immigrants.

With regards to the Turkish context, the explanations discussed above are less likely to be relevant, as refugees have had to leave their home country because of the war in Syria and initially settled densely in the refugee camps and then in the provinces of the southeastern region near the Syrian border. Therefore their aggregation in a particular region gives an opportunity to analyze the refugee effect on regional labor markets. Another significant detail mentioned above is that due to the lack of employment authorization, Syrians were not able to work in the formal sector until 2016, but nevertheless most of them already had informal jobs. This indicates that regardless of Syrians' skill composition, they have mainly engaged in the informal sector and thus increased the informal labor supply. It is therefore assumed that Syrian refugees substitute for Turkish workers in the informal job market.

In this paper, the impact of massive, forced migration of Syrian refugees who are mainly located in the provinces of the southeastern region, on the labor market status of Turkish citizens is estimated by using regional panel data consisting of the years from 2005 to 2018 and adopting fixed effects and random effects models. Relying on the standard economic theory, hypotheses regarding the labor market outcomes of native workers are constructed. In the first model the impact of the refugees on informal employment of Turkish workers is analyzed. Considering the rise in the labor supply provided by the refugees in the informal sector, the refugee inflow is expected to adversely affect informal employment of natives. This is consistent with the estimation result of this paper. The key finding of this paper is that Syrian refugees had a negative impact on informal employment of Turkish workers and displaced native workers in the informal sector. This suggests that Syrian refugees have substituted for Turkish workers whose informal jobs are taken. Thus, Hypothesis 1 presented in Chapter 3, is supported by the estimation result of the first model.

With regards to the refugee effect on formal employment, given the substitutability of the refugees and native workers in the informal sector, it is assumed that natives and Syrian refugees complement each other in the formal sector. Furthermore, since flows of capital into the areas where Syrian refugees are clustered have increased with the growing number of new companies established by the refugees, the labor demand for formal jobs is expected to rise (Cengiz and Tekgüç, 2018). In addition, some of the native workers who lost their informal jobs are expected to move from informal sector to formal sector. Accordingly, in the second model, Syrians' effect on formal employment of Turkish workers is estimated. It is found that the inflow of Syrian refugees led to a positive effect on formal employment of native workers. This result is in line with the assumption of the rise in labor demand and supports the second hypothesis.

Finally, considering the adverse effect of Syrian refugees on informal employment of native workers, possible options for Turkish workers who lost their jobs in the informal sector might be either to leave the labor force or remain unemployed. Thus, unemployment of native workers is expected to increase. However, the effect of the refugee inflow on unemployment of natives is not found to be statistically significant. The likely reason for the lack of effect of the refugees on unemployment of natives can be that those who are displaced in the informal sector tend to leave the labor force rather than stay unemployed. These estimated results differ from the third hypothesis but to some extent are in line with what Del Carpio and Wagner (2015) and Aksu et al. (2018) find in their studies.

The outline of this paper is as follows. Chapter 1 discusses the theoretical literature that examines the labor market effects of immigration. Chapter 2 gives detailed background information on Syrians' arrival and settlement process in the country and also their situations in the Turkish labor market. Chapter 3 presents conceptual framework and hypothesis development

which guide the interpretation of the estimated results. Data and methodology are explained in Chapter 4. Chapter 5 presents the empirical findings. Chapter 6 concludes and provides policy recommendations.

2. Literature Review

The impact of immigrants on labor market is widely discussed topic in the literature. Although there is widespread debate that immigrants have an adverse effect on labor markets by lowering employment and the wages of natives, the empirical analysis of early studies has found small or no impacts of immigrant workers on labor market outcomes of natives. Card (1990) analyzes the impact of Cubans' immigration to Miami and indicates 7% increase in the labor force but finds no significant impact on wages and unemployment of workers who are less skilled. A study which utilizes a natural experiment in which the inflow of Algerian migrants to France resulted in a sudden labor supply shock indicates that Algerians led to a small rise in unemployment of natives with a rate of 0.3% points whereas the average annual wages of the natives decreased by at most 1.3% (Hunt, 1992). In another natural experiment context, Friedberg (2001) examines the migration that increases the Israel's population by 12% in about 4 years and indicates no adverse effects of immigration on labor market outcomes of native workers.

On the other hand, depending on the magnitude and type of migration, labor market consequences might differ. In the case of voluntary migration, one potential cause for the missing impacts might be the selection of immigrant settlement. Immigrants are likely to reside in areas with better labor market opportunities and this might cause an underestimation of their impacts on native workers' employment and wages. Pischke and Velling (1997) examine the migration impacts on German workers' labor market outcomes by including previous

employment outcomes to overcome the potential selection problem but they find no adverse impact of migration. In another German setting, Glitz (2012) analyzes the migration to Germany by relying on a quasi-experimental technique where migrants are exogenously located in certain areas by the German government. In line with the argument discussed above that the selection bias problem arises from non-experimental data underestimates the migration impacts, empirical findings indicate negative employment effects while no adverse impact on the relative wages. Overall, with some exceptions, the literature based on quasi-experimental techniques does not find significant detrimental impacts of immigrants on labor market prospects of native workers. Borjas et al. (1997) criticize early studies focusing on the immigration to a particular area. Analyzing the effects of immigration to a certain region might lead to misleading estimations due to the fact that the impacts of migrants on employment and wages of native workers are not captured as the influx of immigrants to a certain geographic region might cause internal migration of natives, capital flows and changes in trade volumes. This argument suggests that definition of labor markets plays an important role to better identify the substitutability of natives and immigrants. For instance, Borjas and Katz (2007) investigate the migration effect at the country level and find a detrimental impact of the migration of Mexicans on the wages of native workers who are less educated. Consequently, the migration effect on labor market outcomes of natives are better captured with the national data, as the skill composition and the wages vary across groups of workers.

Another argument is that the substitutability of migrants and native workers with different skill levels should play a significant role in the labor market effects of immigrants. Studies estimating the substitution between native workers and migrants report larger impacts of migration on the labor market prospects of native workers. Card (2001) analyzes the impacts of

migration on job-specific labor markets outcomes in US and finds that immigration decreased employment rates and wages of native workers who are low skilled. More recent study of Ottaviano and Peri (2012) examine the elasticity of substitution between migrants and native workers with similar educational attainment and find a little but significant imperfect substitution among them indicating that migration between the years 1990 and 2006 positively affected wages of natives who are below high school education with a ratio varies from 0.6% to 1.7% whereas an adverse effect on wages of those who have migrated previously. Similarly, Özden and Wagner (2014) investigate substitution and scale effects of immigration to Malaysia and report that migrant workers have a positive effect on native workers' labor market outcomes by increasing their employment and wages. Moreover, migration effect differs among natives with different education attainment. Immigrants adversely affect those with primary education and below whereas they have a positive effect on native workers with secondary education and no impact on those who have university degree.

There are also several studies in which the distributional impacts of immigrants on wages of natives are estimated. Card (2007) examines the effect of immigration to US cities by considering the relation between the immigrants and the relative number of workers with low skills in the local labor force and indicates that the proportion of low-skilled workers has increased in those cities which are exposed to high migration inflows. In addition, increased labor supply leads to a rise in the pay gap between low skilled and high skilled natives whereas a positive effect on the salaries of natives. Dustmann et al. (2013), on the other hand, analyzes the wage effects through the distribution of native workers earnings and reports that migrants have an adverse effect on the wages of those who are below the 20th percentile in the wage

distribution whereas positive effect on the wages of those in the upper place of the wage distribution.

With regards to employment effects, Venturini and Villosio (2004) examine the immigration effect on native workers' employment in Italy between 1993 and 1997 by focusing on the risk of being displaced by immigrants and the probability of transition of native workers from unemployment to employment within one year. They indicate that immigrants have a slight or no impact on the natives who look for a new job whereas negative impact on young people who look for a first job for the first year but positive impact in other years. Moreover, they report the complementary effect on the risk of being unemployed and negative impact of immigrants on the natives who work in manufacturing sector. Overall, studies analyzing the immigration effects have utilized different approaches (quasi-experimental, non-experimental) based on the definition of labor supply shock resulting from an inflow of immigrants and skill composition of both native workers and migrants and hence apply different empirical methods. While some of them find small or no significant effects of migration on labor markets, others report sizeable and negative impacts on native workers' employment and wages.

Having indicated the mixed results of labor market effects reported by a large body of literature, it can be argued that compared to empirical studies based on the concept where the voluntary migration takes place, the share of literature which analyzes the labor market consequences of forced migration is more likely to be limited. Ruiz and Silva (2015) analyze the impacts of forced immigration on labor markets and report a significant negative effect on employment of Tanzanians. However, forced migration effects differ depending on the types of the jobs. Their empirical results indicate that natives who are employed in a job that offers a pension and those who work for the government tend to be affected by the forced migration

shock as the growing public services provided by the government in the regions where refugees are concentrated lead to wider government employment opportunities for native workers. In a broader mass migration context, Borjas and Monras (2016) examine four cases of historical forced migration: the migration of Marielitos to Miami in 1980, the inflows of Algerians into France in 1962, the migration of Jewish people to Israel in the beginning of 1990s and the refugees fled Yugoslavia during the Balkan wars from 1991 to 2001. Although the political reasons behind each forced migration and economic conditions of hosting countries differ significantly, their empirical findings are in line with canonical model indicating a common fact that the forced migration has a detrimental impact on labor market outcomes of natives who compete with them while a positive impact on workers who complement each other.

Recently, a small body of literature has investigated the impact of Syrians' mass inflow on the labor markets. Jordan is one of the neighboring countries which has received substantial number of Syrian refugees. Stave and Hillesund (2015) examine Syrians' impacts on the Jordanian labor market and claim that the labor force participation of natives did not change compared to pre-crisis period whereas the unemployment rate of Jordanians rose significantly from 14.5% to 22.1%. They also indicate that the majority of the refugees work informally due to lack of work authorization and those who are employed in the informal sector are more likely to work longer hours with lower wages compared to native workers who work in the same sector. On the other hand, in a more recent paper, Fakihi and Ibrahim (2016) report no adverse effect of Syrian refugees on the Jordanian labor market. Lebanon is another country which has faced massive migration from Syria. David et al. (2018) analyze the Syrian refugee influx on Lebanese economy and finds small or no detrimental effects of the refugees on high-skilled Lebanese workers while adverse impacts on those who are the most vulnerable.

In the Turkish setting, there has been a growing body of research estimating the impact of Syrian refugee inflow on the Turkish labor market. Del Carpio and Wagner (2015) examine the impact of Syrians on labor market outcomes of Turkish natives and report that Syrians displace the Turkish workers from the informal jobs regardless of their age, educational attainment and gender whereas increases formal employment of the workers with no high school diploma. Furthermore, the refugees lead to a displacement of women and those with low level of education in the Turkish labor market and wage decreases in the informal sector. On the other hand, it is indicated that native workers with high skills and women do not benefit from the positive refugee effects on their formal employment. Since high skilled workers are less likely to be employed in sectors with a lot of informality, they are not able to benefit from the lower cost of informal labor. Akgündüz et al. (2015) examine the impacts of Syrian refugee inflow into the southeast of the country on housing and food prices, employment rates of native workers and natives' migration within the country by utilizing difference in differences approach and fixed effects. Their data is obtained from all provinces of the country and also twenty six subregions classified by Nomenclature of Territorial Units for Statistics 2 (NUTS-2). They compare 6 subregions in which the refugees are located in the refugee camps with other 20 subregions which are considered as control area. Their results indicate that the Syrian refugees led to a rise in prices including food and housing and a significant decrease in the inflow of natives in the subregions where the refugees are concentrated. On the other hand, they find no significant employment effects on native workers with different skill levels. Similarly, Bahçekapılı and Çetin (2015) analyze the effects of refugee influx on prices, unemployment, trade volume at regional levels and internal migration patterns by employing difference in difference model in which they compare the seven NUTS-2 subregions where Syrians are densely located in the

refugee camps with the rest 19 subregions where there are no refugee camps constructed. They find that in all seven subregions involved in their study, there was an increase in internal migration and improvement in trade balance with the arrival of the Syrian refugees. Unemployment rates increased and reached above the country average in 3 subregions with the refugee camps while in the subregions where internal migration increased there was no rise in unemployment rate. With regards to inflation, in contrast to Akgündüz et al. (2015), they find that prices decreased in almost all subregions which are significantly affected by the refugee inflow.

In another study where the impacts of the refugees on prices are estimated by Konuk and Tümen (2016), difference in differences approach is employed by using the data on the regional prices for the period 2010-2011 which is considered as pre-immigration and 2012-2014 considered as post-immigration. They find that prices that consumers pay fell by around 2.5% in the subregions where Syrians are located and goods and services sector prices also decreased by almost the same amounts. However, there is a significant difference among the informal sector and formal sector production prices. While the prices in the sectors with informal labor intensity declined by around 4%, the prices in the formal sector was not significantly affected by the refugee inflows. They argue that the price reduction of items produced in the informal sector is caused by the labor cost advantages caused by the rise in the supply of informal Syrian workers. Çeritoğlu et al. (2017) examine the refugee effect on the Turkish labor market by employing difference-in-differences method and comparing the outcomes in 2010-2011 with those in 2012 and 2013, separately. They report sizeable impacts of the refugees on Turkish workers' employment outcomes whereas a small impact on native workers' wages. Their results indicate that the refugee inflows led to a decline in informal employment whereas a slight increase in the

formal employment of Turkish workers thanks to widened public services provided in the region. Moreover, informal native workers who are displaced by Syrians remained unemployed or moved out the labor force. Thus, there was increase in formal and unemployment rates whereas decline in the labor force participation rate, and the rate of native workers who find a job and informal employment. Esen and Binatlı (2017) also estimate the impact of Syrians on regional labor markets by using random effects and fixed effects models and panel data for the years from 2004 to 2016. They find that the refugee inflows caused unemployment rate of native workers to increase while informal and formal employment rates to decrease.

More recently, Cengiz and Tekgüç (2018) analyze the refugee effect on local economies between 2012 and 2015 by using difference in differences model. They include three NUTS-2 subregions with the greatest number of the refugees as the treatment area whereas sixteen NUTS-2 subregions are included in the control area which has much smaller share of the refugees and the rest is excluded. They report no detrimental impacts of Syrian refugees on Turkish workers' wages and employment. On the other hand, the rate of native formal employment rose due to the refugee inflow indicating the complementarity of Syrians and Turkish workers. Moreover, the number of newly established companies including those set up with both Syrian and non-Syrian partnership increased by 24% with the influx of the refugees. They argue that due to the fact that the refugees led to a rise in the regional demand and capital supply, the local economies were able to absorb the refugee influx. Therefore, no negative employment and wage effects are found.

Unlike previous studies indicated above, Aksu et al. (2018) examine the distributional effects of the refugee influx on the labor market status of Turkish workers in both informal and formal sector by gender, age and education level. They also use difference in differences model

and define the treatment area including five NUTS-2 subregions which have the greatest ratio of Syrian refugees to native population while the rest of the NUTS-2 subregions as the control region. They document that the massive inflow of Syrian refugees did not have a negative effect on the average wages of men and women and employment rates of men but decreased the total employment of women. On the other hand, Syrian refugees had detrimental impacts on Turkish workers employed in the informal sector but positive impacts on complementary native workers in the formal sector. They indicate that an equal rise in the employment of natives in the formal sector counterbalanced the decline in informal employment of men. In addition, they report an increase in the prices in product markets and capital movement to the subregions analyzed as the treatment region.

3. Background Information

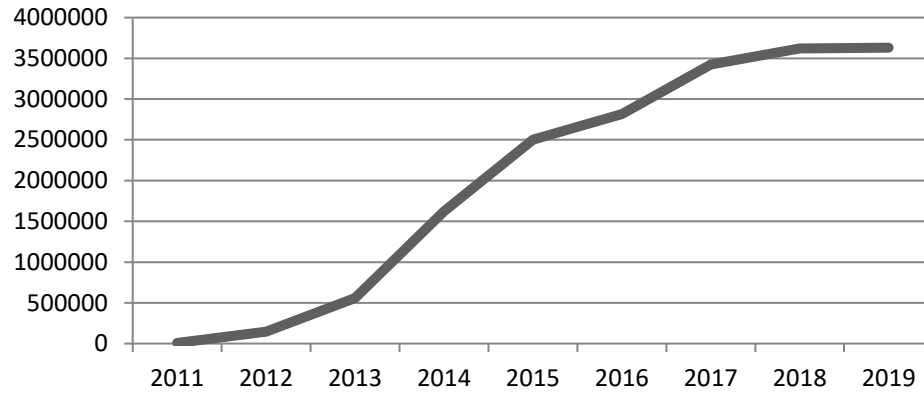
Since the Syrian civil war started in March 2011, more than 13 million Syrians have remained in need of assistance and over 5.5 million Syrians have had to flee the country (UN, 2019). Turkey has implemented an “open door” policy by allowing the first entrance of 252 Syrians into the country in April 2011 (DGMM, 2015). 1951 Refugee Convention and 1967 Protocol have been ratified by Turkey with a geographical limitation which indicates that asylum seekers originating from Europe have a right to be considered as refugees. Those who do not arrive to the country from the European zone are able to remain in Turkey until they are settled to a third country. Since Syrians do not come from Europe, they were not recognized as legal refugees and were considered as “guests”. Moreover, they did not have the rights which are given to legal refugees.

In October 2011, the Turkish government introduced a temporary protection regime for Syrian refugees in the country. Under the temporary protection status, they are eligible to stay with no time restriction in Turkey. Moreover, protection against being sent back to their home country and an access to assistance for emergency needs is provided (WFP, 2012). However, this regime was not sufficient enough in terms of recognition of their rights and obligations in the country and hence in order to clarify Syrians' legal status and rights and provide better protection of the refugees, the law on Foreigners and International Protection (LFIP) was enacted in 2013 and Directorate General of Migration Management (DGMM) was founded in 2014.

Furthermore, in October 2014, with the introduction of Temporary Protection Regulation, identification cards have been given to the refugees to provide them a wider access to public services consisting of education and health (İçduygu and Diker, 2017). With these steps, the country has made a progress to recognize the needs of the refugees. In order to provide shelters to Syrians, the Turkish government with the coordination of the Turkish Disaster Response Agency (AFAD) has started to open refugee camps in Hatay. However, as the number of Syrian people crossing the borders has rapidly increased since 2011, additional refugee camps were built in the provinces of the southeastern region and the total number of the refugee camps has reached 21 in two years. Refugee camps are located in Kilis, Hatay, Şanlıurfa, Gaziantep, Osmaniye, Adıyaman, Kahramanmaraş, Malatya, Mardin and Adana (DGMM, 2015). These cities are in the southeastern part of the country and close to the Syrian borders. In 2011, the number of Syrian refugees in the country was only about 8000 while it increased significantly to 560,129 in 2013. The inflow of Syrian refugees has accelerated since 2013 and there were more than 2,5 million registered refugees in the country by the end of 2015 (see figure 1). Currently, Turkey have the largest share of Syrian refugees which is above 3,5 million in 2019 whereas the

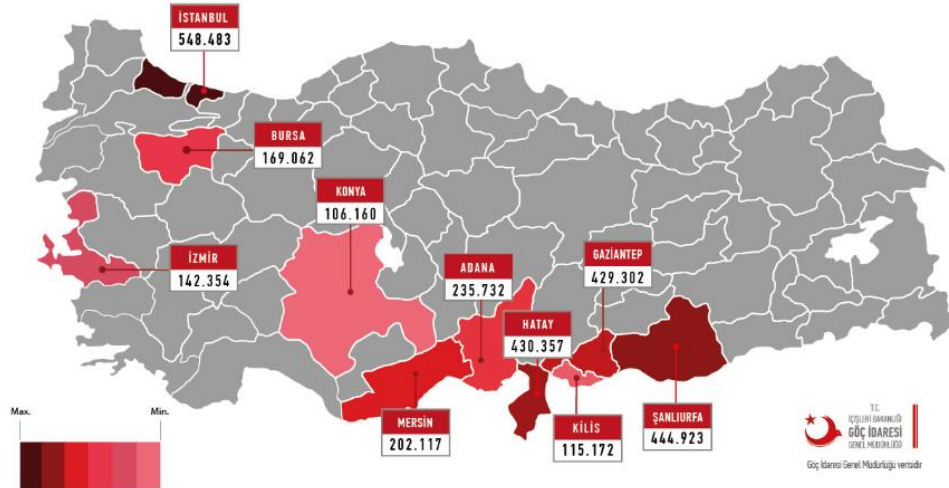
number of registered Syrian refugees is 132,281 in Egypt, 253,371 in Iraq, 660,393 in Jordan and 938,531 in Lebanon over the same period (UNCHR, 2019b).

Figure 1. Number of registered Syrians in Turkey, 2011-2019



Source: United Nations High Commissioner for Refugees, 2019

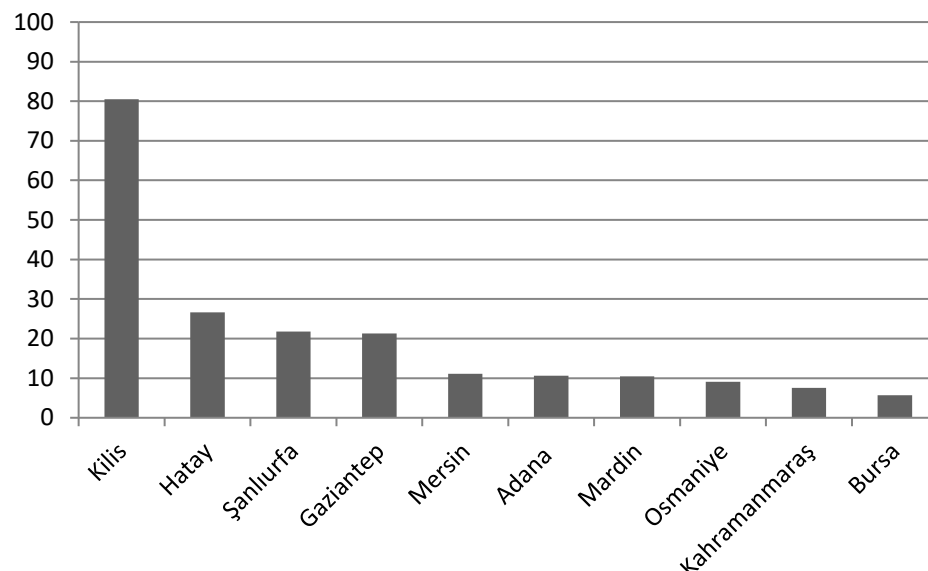
Figure 2. Distribution of Syrian refugees by top 10 provinces, 2019



Source: Directorate General of Migration Management, 2019

Initially, Syrians were mostly located in the refugee camps, but in time they have started to leave the camps and settle in provinces close to the Turkish-Syrian border and urban areas. The number of sheltered refugees was 210,191 in 2013 while it increased to 267,243 in 2015. On the other hand, in 2019, only 136,880 Syrian refugees are located in the camps whereas 3,468,735 Syrians live outside the camps in the country (Directorate General of Migration Management, 2019). However, in order to have access to free public services offered by the Turkish government, the majority of those who accommodate outside the camps for refugees have preferred to remain in the provinces where these refugee camps are constructed. Figure 2 demonstrates the top ten cities which host the highest number of Syrian refugees. Although there is a considerable amount of Syrian refugees who have relocated to the bigger cities in the other regions of the country including İstanbul, Konya, and İzmir, the number of refugees has been relatively small compared to population of those cities. Based on the ratio of the refugees to total native population indicated by the Directorate General of Migration Management (2019), they have been mostly concentrated in the provinces of the south east of Turkey. Kilis, which is a smaller city located in the southeastern region, has the highest refugee density with a ratio of 80,51% and this figure is 26,60% in Hatay, 21,79% in Şanlıurfa and 21,27% in Gaziantep (see figure 3). Hatay and Şanlıurfa are relatively small cities while Gaziantep is the largest and most developed city of the southeastern region. Therefore it can be argued that the high refugee density in those relatively small cities might lead to significant economic, political and social impacts. On the other hand, the provinces like İstanbul, İzmir and Konya which are relatively far from the Syrian border are less influenced by the refugee inflow with a ratio of lower than 5%.

Figure 3. Share of refugee density by top 10 provinces, 2019



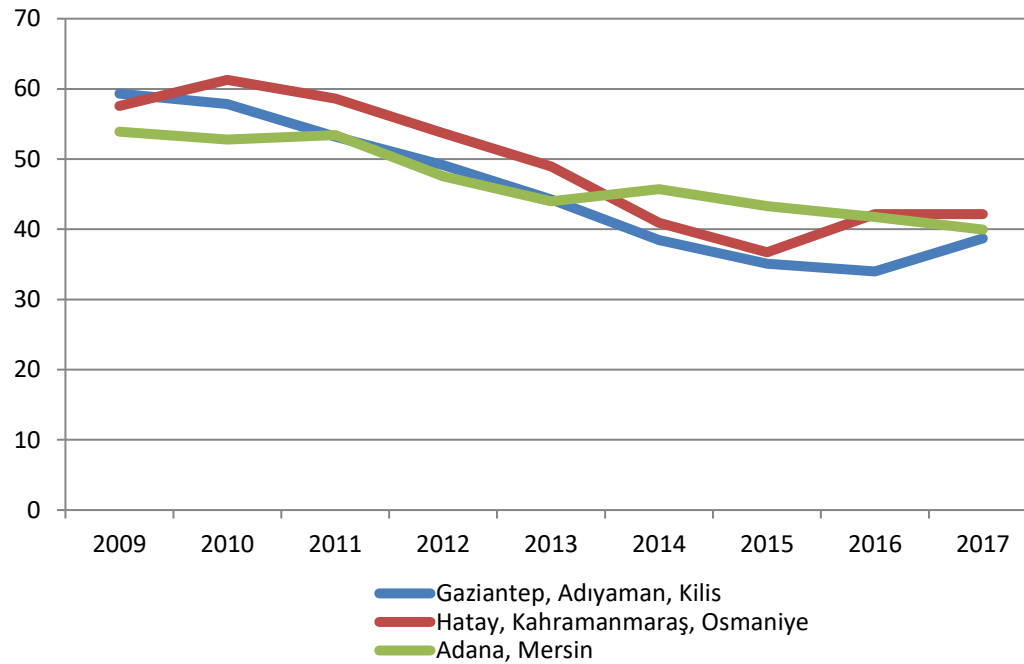
Source: Directorate General of Migration Management, 2019

With regards to demographic characteristics of Syrian people in the country, the proportion of male refugees is greater than the female ratio. According to Directorate General of Migration Management (DGMM), 54.2% of total refugee population has been male while 45.8% of them have been female in 2019. The ratio of youth population aged between 15 and 24 is 15.1% whereas working age population (ages 15 to 64) makes up 52.1% of total refugee population over the same period. Moreover, the proportion of the refugees with lower educational attainment is relatively high. Based on a field survey of the Disaster and Emergency Management Authority (AFAD) conducted in 2017, 23% of the refugees were illiterate while 26% of them were with primary education. The rate of those who are with a high school degree was 12.4% whereas only 8.4% of those were with tertiary education. In terms of their marital status, 53.3% of the refugees were single while 43.7% of them were married.

3.1 Syrian Refugees in the Turkish Labor Market

As Syrian refugees did not have a work authorization until 2016, they were not allowed to work legally in the country. However, they need to maintain their lives somehow and the absence of work authorization left them with no choice but to join informal workforce. Therefore, most of them have participated in the informal sector which consists of jobs with very poor working conditions and low wages. The share of informal sector is very large in Turkey with a rate of around 25 – 30% of the country's gross domestic product (gdp) (Ateşagaoglu et al., 2017). According to the Social Security Institution (2019a), the rate of informal employment of Turkish citizens in the country was 43.25% in 2010 whereas this rate in the TRC1 subregion classified by NUTS-2 including the provinces of Gaziantep, Adıyaman and Kilis, is much higher with 57.82% which indicates a wide range opportunities of informal employment for the refugees. After the refugee inflow in 2017, the rate of informal employment of Turkish citizens decreased to 33.97% in the country whereas in the cities of Gaziantep, Adıyaman and Kilis, this rate declined dramatically to 38.71%. Similarly, in other NUTS-2 subregion with a high refugee density consisting of Hatay, Kahramanmaraş and Osmaniye, the rate of informal employment was 61.28% in 2010 whereas it significantly declined to 42.14% in 2017. This suggests that after Syrian refugees have arrived, the proportion of Turkish workers who have informal jobs in the provinces with a high refugee density decreased (see figure 4).

Figure 4. Informal employment rate of natives by 3 NUTS-2 subregions, 2009-2017



Source: Social Security Institution, 2019

With the introduction of new legislation on Temporary Protection Regulation in 2014, The Turkish government has started to issue identity cards for temporary protection to provide Syrian refugees wider range of public services consisting of education, health care and formal labor markets. Those who have temporary protection documents are able to make an application for a work permit with geographical, professional and sectoral constraints (İçduygu, 2015). However, it was a long process to complete the legal arrangements for this regulation. Therefore, the number of Syrian refugees who were granted a work permit was only 7,351 until 2016. In order to tackle informal employment of Syrian refugees, the law on Regulation on Work Permit of Refugees under Temporary Protection has been enacted in January 2016 and Syrians has been eligible to have work permits with certain limitations and restrictions. On the other hand, most of Syrian refugees have already been employed in the informal sector and the number of Syrians who have a work permit increased only to 13,290 in 2016 (Ministry of Labor and Social

Security, 2019). Several factors can explain the substantially low number of issued work permits. One of them is that the high cost of formal employment of Syrian refugees does not appear attractive to employers as they are required to pay taxes, the minimum wage and social insurance payment. Therefore the refugees are more likely to be hired informally in the first place. Moreover, those who are already employed in the informal sector but have a chance to work formally are not able to request a formal position as they believe that they might be dismissed from their employment (İçduygu and Diker, 2017). This concern is more likely to prevent their transition from informal to formal employment and force them to maintain their vulnerable position in the informal sector. Other reason might be language barriers faced by Syrian refugees which make it hard to find a job in the formal sector (Del Carpio and Wagner, 2015; Akgündüz et al., 2015; Çeritoğlu et al., 2017).

There is no official statistics neither on informal nor on formal employment of Syrian refugees, as they do not have legal citizenship in the country. However, Kadkoy (2017) estimates the number of Syrian refugees who work informally varying between 500,000 and 1,000,000. The 2016 regulation regarding work permits did not solve the problem of informal employment of Syrian refugees due to its certain conditions and restrictions and hence they have remained in the informal sector. A considerable amount of evidence indicates that the majority of Syrians in the provinces near the Turkish-Syrian border work in the informal sector and they are concentrated mainly in low skilled jobs of construction, textile, industry and agriculture sectors. Moreover, those who are employed in the informal sector suffer from poor working conditions which force them to work without social benefits, longer hours and with much lower wages compared to native workers (Kirişçi, 2014; Lordoğlu and Aslan, 2015; Ferris and Kirişçi, 2016). It is also claimed that in some sectors especially in agricultural sector, Syrian refugees have

different working conditions and wages than what native workers have for an identical work (Development Workshop, 2016).

Employers in business and construction sectors of the bordering provinces enjoy employing Syrian refugees as they pay lower salaries than what they would have to pay for native workers. In addition to that, they are not required to make a payment for social security contributions of the refugees (Demir, 2015). As a consequence, the inflow of cheap labor provided by Syrian refugees had led to an unfair competition in the Turkish labor markets, particularly in the provinces near the Syrian border. Moreover, cheap labor force of Syrian refugees has been perceived as a threat to native workers. According to a survey research conducted by Erdoğan (2014), 56.1% of Turkish citizens have the same opinion indicating that “Syrian refugees are taking our jobs” whereas this ratio rises to 68.9% in the provinces near the Syrian border. A study conducted in the provinces close to the Turkish-Syrian border by ORSAM (2015) claims that 87% of Turkish people from Hatay who lost their jobs think that their job loss is due to Syrian refugees. Moreover, in Gaziantep in which the rate of workers who lost their jobs is relatively small compared to the cities in the south east of the country, more than half of the participants who are employed believe that Syrian refugees has increased the risk of losing their jobs.

With regards to formal employment, a majority of those who are employed in the formal sector have started a business by establishing their own commercial companies in industrial cities such as İstanbul, Gaziantep, Hatay and Mersin. Some of those companies were set up in partnership with domestic entrepreneurs. The Union of Chambers and Commodity Exchanges of Turkey (2019) indicates that the number of businesses set up by Syrian entrepreneurs went up dramatically to 1,764 in 2016 whereas this number was only around 100 in 2011 (Kaymaz and

Kadkoy, 2016). Most of those companies, with a rate of over 60%, have been set up in Istanbul and the other main locations of those companies have been Gaziantep and Hatay (Ulutaş, 2016). Another group of Syrian refugees in the formal sector includes those who work as independent artisans and traders (Lordoğlu and Aslan, 2015).

Overall, it can be argued that Syrian refugees have entered in the Turkish labor market by working in different kinds of jobs in the formal and informal sector. However, the majority of those who are employed in the informal sector appear to be the most vulnerable group as they have been exposed to unsafe and poor working conditions including long working hours and much lower salaries compared to native workers. The impact of the refugee inflow on the Turkish labor market differs across provinces and regions depending on many factors such as demographic characteristics of both the refugees and natives in the labor force, density of the refugee population in each city and specific labor market characteristics of local economies. Without doubt, as Syrian refugees are densely located in the cities of the south east of Turkey which have relatively low population density, the magnitude of inflows of Syrian refugees in those provinces is likely to be large enough to have noticeable impacts on local economies.

4. Conceptual Framework and Hypothesis Development

In order to develop the hypotheses based on the impacts of Syrian refugees on labor market outcomes of Turkish workers in the informal and formal sectors, I outline a conceptual framework through the basic canonical model and its predictions. The simple theory of the model assumes a constant elasticity of substitution (CES) production function in which the production output determined by the combination of capital (K) and labor (L). In the model, one type of workers is assumed to be low skilled whereas the other type of workers is assumed to be high skilled and those with high skills are more likely to be university graduates whereas those

with low skills have high school degree or less than high school. Moreover, the jobs which are held by the workers with high skills differ from than the jobs in which workers with low skills work and hence labor is assumed to be homogenous in the model. The substitutability of two types of workers and competitive labor markets are the main assumptions of the model (Acemoglu and Autor, 2011).

With regards to the impacts of migration on labor supply shocks, one of the assumptions of the canonical model is the substitutability of immigrants and native workers. Accordingly, migration is expected to increase labor supply and also competition in labor markets. As a consequence, the rate of native employment is expected to decrease due to the fact that they might be displaced by migrant workers. Under this theoretical framework, migration is expected to adversely affect native workers' labor market outcomes. On the other hand, in reality it is known that labor is heterogeneous and migrant workers may have different skill compositions than native workers and hence lead to different labor market outcomes (Kahanec and Zimmermann, 2008). Moreover, the substitutability of migrants for native workers might differ depending on their human capital stock and integration into the labor market of the receiving country. Furthermore, in the presence of voluntary immigration, migrants may choose to move to a specific area which offers better economic and labor market opportunities and this might result in underestimated effects of migration on the labor market outcomes of native workers (Akgunduz et al., 2015). Therefore it can be argued that since the effects of migration on the labor market depend on several factors including substitutability of migrant workers for natives, pre-migration labor market conditions of the receiving country and the scale of immigration, the labor market outcomes of native workers might differ across regions and countries (Kahanec and Zimmermann, 2008).

Besides the standard assumptions of the migration models, there are several factors which make the forced displacement of Syrian refugees to Turkey as a special case. First of all, the massive and involuntary inflow of refugees which make Turkey the largest hosting country is very rare. Secondly, Syrian refugees have been settled mostly in the provinces of the southeastern region close to the Turkish-Syrian border in which the camps for refugees are constructed due to several reasons including free public services in the refugee camps and hence their settlement is more likely to be exogenous to their own choices and local labor market opportunities. Therefore, their geographic constraints in their destinations provide an opportunity to analyze the impacts of migration which result in supply shocks across regions by using the regional data. Thirdly, as the Syrian refugees did not have a legal right to work until 2016, most of them were engaged in the informal sector regardless of their skill level (Del Carpio and Wagner, 2015). This makes the influx of Syrians as a well-defined supply shock in the informal sector and gives an opportunity to distinguish and analyze separately the impact of the refugees on native workers who might be displaced by the refugees in the informal sector and those who work in the formal sector. Moreover, in terms of demographic characteristics and education level of Syrians, there are some similarities compared to native workers who live in the provinces of the southeastern region where the majority of refugees are clustered. Syrian refugees have on average low education attainment. As indicated above, the rate of Syrians who have high school degree and above is only about 20% (AFAD, 2017). Similarly, 83% of natives in the southeastern region have education level below high school. Furthermore, the age range of the majority of the natives and Syrian refugees in the region is between 19 and 54 (Çeritoğlu et al., 2017). These similar characteristics of Syrian refugees and natives in the southeastern region indicate a high degree of substitution between Syrians and Turkish workers in the labor force.

In the light of these facts, it can be assumed that native workers who work in the informal sector and Syrian workers are substitutes while there is a complementarity between native workers and Syrian workers in the formal sector. On the other hand, it has to be stated that the magnitude of the impacts of refugees on employment of natives both in the formal and informal sectors depends on several factors including the elasticity of labor supply and demand. Nevertheless, I would expect to see a high level of substitution among Turkish workers and Syrian refugees in the informal sector as Turkish workers who work in the informal sector tend to be low skilled (Aksu et al., 2018). Since the inflow of Syrian refugees increases the labor supply and competition, Syrian refugees are expected to adversely affect Turkish workers by displacing them in the informal sector and hence decrease their employment. Accordingly, I state my first hypothesis as follow:

H1: As the labor supply of Syrian refugees increases, the informal employment of native workers falls.

With respect to employment in the formal sector, it is less likely to make accurate predictions about potential effects of Syrians on Turkish workers' employment due to the existence of native workers with various skill levels. One of the assumptions is that Syrians are less likely to have a negative impact on native worker's formal employment due to the presence of semi-skilled and high skilled jobs which require Syrian refugees to have necessary qualifications such as the knowledge of Turkish language. On the other hand, it is also possible that the growing labor supply in the informal sector might increase native workers' demand for occupations in the formal sector and hence result in a rise in Turkish workers' employment. Furthermore, the rise in the number of companies founded by both Syrians and non-Syrians resulting in an upward shift of the labor demand curve in the formal sector is expected to

positively affect formal employment of natives (Cengiz and Tekgüç, 2018). Therefore, I outline my second hypothesis as follows:

H2: As the inflow of Syrian refugees increases the labor demand of native workers in the formal sector, the formal employment of native workers rises.

The last assumption of the impact of Syrian refugees on Turkish workers' unemployment is that unemployment of native workers is expected to increase, if the native workers who are displaced by the refugees in the informal sector do not leave the labor force and remain unemployed. Thus, I state the third hypothesis as below:

H3: As Syrian refugees displace the native workers in the informal sector, the unemployment of native workers increases.

In sum, I expect employment of natives to fall in the informal sector due to refugee inflows. Those whose informal positions are taken over by Syrian refugees might move to formal labor markets that lead to an upward shift in supply curve. Thus, this suggests Turkish workers' employment to increase in the formal sector. Furthermore, growing number of new companies that are set up by both Syrian and non-Syrian entrepreneurs in the country is expected to further increase formal employment of natives as the demand for labor rises in the formal sector. Finally, unemployment of natives is expected to rise in the case where the natives whose informal jobs are taken by Syrian refugees remain unemployed.

5. Data and Methodology

In all estimated models in this study, panel data based on the subregions classified by Nomenclature of Territorial Units for Statistics-2 (NUTS-2) which is representative at the national level and includes 26 subregions of the country is used between the years 2005 and 2018. A list of NUTS-2 subregions is provided in Appendix. A variable for Syrian refugees is included as a density variable by using the number of Syrians at the regional level classified by NUTS-2 (Esen and Binatlı, 2017). If the number of Syrians in the subregion is lower than 1000, the variable has the value of 0, whereas it takes the value 1, if the number of Syrians is between 1000 and 25,000. The variable has the value of 2, if the number of refugees is between 25,000 and 50,000 while it takes the value 3, if this number is greater than 50,000. Although the number of registered Syrian refugees for all years and each subregion is not consistently available, Directorate General of Migration Management (DGMM) and reports of the Disaster and Emergency Management Presidency (AFAD) provide the statistics on the distribution of Syrian refugees by province. Therefore, I construct the variable indicating the refugee concentration in each subregion by using the information on the number of Syrian refugees registered in each city provided by the annual reports of AFAD and statistics published by DGMM.

Labor market statistics are representative for the native population as the refugees are not included in official statistics. Data on the labor market is available at the NUTS-2 regional level. Labor market variables within the subregion of residence consist of the number of Turkish citizens who work in the formal sector, the number of Turkish citizens who are employed in the informal sector and the number of those who are unemployed. Moreover, three education levels of the workforce are categorized for each subregion: the number of illiterate individuals who are considered as uneducated in the labor force, the number of individuals who have a high school

degree in the labor force and the number of individuals who have tertiary education in the labor force. Finally, gross domestic product (gdp) of each subregion is included as an additional variable. Data on the labor market outcomes of natives, educational attainment of those in the labor force are drawn from the Turkish Statistical Institute's (TurkStat) Regional Results of Labor Force Statistics and data on the regional gross domestic product by NUTS-2 subregions is also obtained from the Turkish Statistical Institute's (TurkStat) regional statistics database (TurkStat, 2019a; TurkStat, 2019b).

In order to analyze the impacts of Syrian refugees on regional labor markets, both fixed effects model and random effects model are employed by using the panel data between the years 2005 and 2018 and the Hausman specification test (Hausman, 1978) is performed for model selection.

The fixed effects model can be expressed as below:

$$y_{it} = \alpha_i + \beta_1 X_{1,it} + \dots + \beta_k X_{k,it} + \gamma_2 D_2 + \dots + \gamma_n D_n + \varepsilon_{it} \quad i = 1, \dots, n; \quad t = 1, \dots, T$$

where y denotes the dependent variable, i and t stand for subregion and time, respectively, X represents explanatory variables, D indicates a dummy explanatory variable which takes values for each subregion and ε is the error term. β and γ are the parameters while α is a subregion-specific component of the model.

The random effects model can be denoted as below:

$$y_{it} = \mu + \beta_1 X_{1,i} + \beta_2 X_{2,i} + \dots + \beta_k X_{k,i} + v_{it}$$

$$\text{and } v_{it} = \alpha_i + \lambda_i + u_{it}$$

where i and t represent subregion and time, respectively, y denotes the dependent variable, β is the parameter of the model, X represents explanatory variables while v is the composite error term consisting of random error, subregion-specific and time-specific terms.

Fixed effects model is used to tackle unobserved heterogeneity which is caused by time-invariant characteristics of the subregions such as a subregion's distance to the coast or the border. In other words, this model gives an opportunity to eliminate the potential source of bias due to the correlation between the dependent variable and the error term by controlling those subregional characteristics which do not vary over time. In this model, those stable subregional characteristics are assumed to be specific and hence should be uncorrelated with other subregional characteristics. On the other hand, in random effects model, it is assumed that those characteristics are random and not correlated with other variables which are included in the model (Greene, 2012). The model selection should be based on the existence of the correlation between the error terms and regressors in the panel data model. Therefore, in order to detect the existence of the correlation and decide between fixed effects model and random effects model, the hypothesis test called Hausman specification test is used. The null and alternative hypotheses of the test are stated as follows:

H0: The error term is not correlated with explanatory variables in the panel data model. The preferred model is random effects.

H1: The correlation between the explanatory variables and error term and in the panel data model is statistically significant. The preferred model is fixed effects.

In order to investigate the impact of Syrian refugees on Turkish citizens' labor market outcomes, three labor market statuses of natives involving informal employment, formal employment and unemployment are analyzed separately in three models. In these three models where the number of native workers who are employed in the formal sector, the number of natives who are employed in the informal sector and the number of natives who are unemployed are the dependent variables respectively, the same indicators at the regional level classified by the NUTS-2 subregions are included as explanatory variables. Explanatory variables at the level of 26 subregions consist of the number of individuals who are illiterate, the number of individuals having a high school diploma, the number of individuals with tertiary education, regional gross domestic product (gdp) and the variable taking the values from 0 to 3 and indicating the Syrian refugee density for each subregion. With the exception of the variable indicating the refugee density, all other variables are constructed in the logarithm form in the econometric analysis. A list of variables included in the regression analysis and their descriptions are provided in Appendix. It should be indicated that indeed, there must be other indicators which might significantly affect Turkish citizens' labor market outcomes. However, since the available data and the number of indicators at the level of NUTS-2 subregions which are relevant for the labor market outcomes is very limited, all other relevant indicators which are potentially important for labor market outcomes cannot be included in the regression analysis.

6. Empirical Findings

In this chapter, as a test of hypotheses that are presented in Chapter 3, the impact of Syrian refugees on employment outcomes of native workers is investigated by estimating the Syrian refugee density effect on the labor market status of Turkish workers including informal employment, formal employment and unemployment. All models are estimated with both fixed

and random effects models by including the same variables as explanatory variables for each model. In order to assess the refugee effects on the Turkish citizens' labor market outcomes, the labor market status of interest is regressed on the variable indicating the refugee density in each subregion with other explanatory variables. The main variable of interest, on the other hand, is the variable which indicates the Syrian refugee concentration in each NUTS-2 subregion. Thus, the coefficient of the refugee density variable is interpreted as the effect of the refugee inflow on Turkish citizens' labor market outcomes. In order to choose between random and fixed effects models, the Hausman test is used under the null hypothesis indicating that random effects model is the preferred model as the error term is considered to be uncorrelated with explanatory variables.

In the subsections below, the details of economic specification and the results of estimated models are presented and discussed. In 6.1 the estimation results for the migrant effect on informal employment of Turkish citizens are shown whereas in 6.2 empirical findings of the refugee effect on formal employment of Turkish citizens are presented. Finally, 6.3 documents the estimated results for the impact of Syrian refugees on unemployment of Turkish citizens.

6.1 Informal Employment of Turkish Natives

The effect of Syrian refugee influx on informal employment of native workers is estimated first. The log transformation of the number of native workers who are employed in the informal sector in each subregion classified by the NUTS-2 is the dependent variable. The explanatory variables include log transformation of the number of individuals in the labor force by education levels including those who are uneducated, with high school degree and tertiary education respectively, log transformation of the regional gross domestic product and the main variable of interest indicating the refugee density in each NUTS-2 subregion. Econometric analysis is

estimated with both fixed effects and random effects models. In order to decide which model is appropriate and should be preferred, the Hausman specification test is employed. Table 1 reports the regression analysis findings of fixed effects model investigating the impact of Syrian refugee inflow on informal employment of Turkish natives.

Table 1. The impact of the Refugees on Informal Employment of Turkish Natives

Refugee density	-0.0418*** (0.0085)
lnuneducated	0.4225*** (0.0227)
lnhighschool	0.2059*** (0.0670)
lnuniversity	-0.0345 (0.0442)
lnregional_gdp	0.0455 (0.0300)
Constant	5.4465*** (0.7367)
# of Obs	364
# of Groups	26
R ² within	0.5202
R ² between	0.7567
R ² overall	0.7289
F-test	72.21***
Hausman Test	21.06***

Note: *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

The estimated coefficient of the main variable of interest refugee density is statistically significant at the 1% level. The expected negative sign of the coefficient on the variable for refugee density shows that refugee inflow adversely affects Turkish workers by decreasing their employment in the informal sector. This finding is in line with the major consensus of the

literature (Del Carpio and Wagner, 2015; Esen and Binatlı, 2017; Çeritoğlu et al., 2017; Aksu et al., 2018).

It should be noted that the negative Syrian refugee effect on informal employment of natives is consistent with the legal status of Syrians in Turkey. They were not able to apply for work permits until 2016, as they do not have legal refugee status instead they have been under temporary protection since 2011. However, a considerable amount of evidence documents that the large share of Syrian refugees has been already employed in the informal sector and the lack of work authorization has prevented their movement from informal sector to formal sector (Del Carpio and Wagner, 2015; Kadkoy, 2017; Çeritoğlu et al., 2017). Furthermore, they are not able to utilize their existing skills and experience in the formal labor market due to lack of knowledge of the Turkish language (Akgündüz et al., 2015). Thus, it is assumed that Syrian refugees are more likely to substitute for natives who are employed in the informal sector. As predicted, the inflow of Syrian refugees has led to a labor supply shock and resulted in a displacement of Turkish citizens in the informal sector. This result supports the proposition of the Hypothesis 1 indicated in Chapter 3.

The interpretation of the impact of Syrian refugees on the informal employment of Turkish workers can be considered as positive or negative depending on the post-status of natives who are displaced by the refugees. Considering the large share of informal sector and the prevalence of informal jobs in the country, working informally might be considered as a better outcome than being unemployed (Çeritoğlu et al., 2017). Thus, a decrease in the informal employment of Turkish workers might be considered as an adverse impact, as long as they do not move from informal position to formal position.

The estimated coefficients of the variables indicating educational attainment of the labor force including the number of uneducated people and the number of people having completed high school in the labor force are found to be statistically significant at the 1% level. The positive sign of coefficients of those two variables indicate that the higher the number of uneducated individuals and the number of those having completed high school education in the labor force, the higher the number of natives who have informal jobs. The coefficient of the variable showing the number of uneducated individuals is greater than the coefficient of the variable indicating the number of people who have high school degree. Considering the skill composition of the native workers in the informal sector where the majority of the workers who are more likely low-skilled, these estimated results are in line with the characteristics which are specific to informal sector (Aksu et al., 2018).

6.2 Formal Employment of Turkish Natives

In this regression analysis, the dependent variable is a log transformation of the number of natives who are employed in the formal sector in each subregion included in NUTS-2 classification. The main indicator of interest as an explanatory variable is the refugee density variable. Indicators of educational attainment of labor force including the number of uneducated people, the number of people with high school diploma and the number of people with university degree are included in the logarithm form as independent variables. Moreover, log transformation of the regional gross domestic product is included in the regression model. The estimation of econometric analysis is utilized by using random effects model and fixed effects model. The selection of these two models is made with the Hausman specification test. Table 2 provides the estimation results of the analysis conducted with fixed effects model.

Table 2. The impact of the Refugees on Formal Employment of Turkish Natives

Refugee density	0.0125** (0.0061)
lnuneducated	0.0118 (0.0162)
lnhighschool	0.2818*** (0.0480)
lnuniversity	0.3804*** (0.0316)
lnregional_gdp	0.1046*** (0.0215)
Constant	3.0743*** (0.5274)
# of Obs	364
# of Groups	26
R ² within	0.9200
R ² between	0.9767
R ² overall	0.9657
F-test	765.63***
Hausman Test	35.12***

Note: *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

The coefficient of the variable of the refugee density is statistically significant at the 5% level. The sign of the coefficient indicates that the impact of refugee inflows on employment of natives in the formal sector is positive. The inflow of Syrian refugees appears to increase formal employment of natives. This estimated result is consistent with the empirical findings of Çeritoğlu et al. (2017), Cengiz and Tekgüç (2018) and Aksu et al. (2018). Furthermore, this finding confirms the simple framework assuming that Syrian refugees substitute native workers who are employed in the informal sector whereas there is a complementarity between natives and the refugees in the formal sector. Accordingly, the refugee inflows lead to displacement of Turkish workers in the informal sector as it increases the informal labor supply. This growth in

the supply of informal labor is expected to raise the demand for occupations in the formal sector and hence formal employment of natives. Furthermore, as indicated above, the number of companies founded with Syrian entrepreneurs went up dramatically from 100 in 2011 to 1,764 in 2016 (Kaymaz and Kadkoy, 2016). Cengiz and Tekgüç (2018) also document that the inflow of Syrian refugees resulted in an increase in newly established companies by 24%. Therefore, this rise in capital supply is expected to further increase the labor demand in the formal sector. The estimated positive significant effect of the refugees on Turkish citizens' formal employment is in line with this assumption and also with these empirical findings. Thus Hypothesis 2 suffices.

With regards to variables indicating the educational attainment of the Turkish labor force, both the number of persons having completed high school and the number of those who have university degree are found to be statistically significant at the 1% level. Although both of them appear to have a positive impact on employment of natives, the magnitude of this impact is greater for the number of people with tertiary education than those with high school diploma. Moreover, the coefficient of the regional gross domestic product (gdp) is found to be statistically significant and positive. These findings are in line with empirical results of Seyfried (2005) and Akkemik (2007) indicating that the growth in gross domestic product of a country tends to be accompanied by increase in the job creations.

6.3 Unemployment of Turkish Natives

The dependent variable of the equation is the log transformation of the number of unemployed natives in each subregion classified by NUTS-2. With the exception of the variable that indicates the Syrian refugee density in each NUTS-2 subregion, logs are taken of all other explanatory variables which include the number of uneducated individuals in the labor force, the number of individuals having completed high school education in the labor force, the number of

individuals who have university degree in the labor force and the regional gross domestic product (gdp). The econometric analysis is performed by using both random effects and fixed effects models. The Hausman specification test is employed to make a comparison between these two models. Table 3 presents the estimated impact of Syrian refugees on unemployment of Turkish citizens with fixed effects models.

Table 3. The impact of the Refugees on Unemployment of Turkish Natives

Refugee density	-0.0039 (0.0198)
lnuneducated	0.1776*** (0.0527)
lnhighschool	1.0072*** (0.1559)
lnuniversity	-0.0436 (0.1027)
lnregional_gdp	-0.0080 (0.0697)
Constant	-2.0227 (1.7135)
# of Obs	364
# of Groups	26
R ² within	0.2329
R ² between	0.8312
R ² overall	0.7743
F-test	20.23***
Hausman Test	39.46***

Note: *, **, and *** indicates significance at the 10%, 5% and 1% levels, respectively.

The coefficient of the variable of refugee density indicates that there is no statistically significant evidence of the refugee inflow on unemployment of natives. In other words, Syrian refugees are less likely to have an impact on unemployment of natives. This finding is in line with the empirical results of Del Carpio and Wagner (2015) and Aksu et al. (2018). The likely reason for missing refugee effect on native unemployment can be explained by the assumption

that natives who are displaced by the refugees in the informal sector might either drop out the labor force or move to formal labor markets. Çeritoğlu et al. (2017) document that 50% of native workers whose informal jobs are taken by the refugees left the labor force whereas 18% of those found a job in the formal sector and the rest remained unemployed. They also analyze the distributional effects of the refugees on unemployment by gender and educational attainment and find statistically significant impact of the refugees on men's unemployment but insignificant on women's. In terms of education level, there is a statistically significant change in unemployment of those without a high school degree. Therefore, a large share of men whose informal jobs are taken by the refugees were more likely to stay unemployed whereas the great majority of women who are displaced by the refugees in the informal sector left the labor force. It can be argued that labor market attachment might differ depending on gender and education levels of natives.

The coefficients on the variables indicating the level of education of the labor force indicates that the impact of the number of uneducated individuals and those who have high school degree in the labor force on unemployment of natives is found to be statistically significant. Undoubtedly, the higher the number of uneducated natives who are in the labor force, the higher the number of unemployed people. On the other hand, the magnitude of the effect of the number of individuals with high school degree on unemployment of natives is much greater. This can be explained by the recent unemployment rates of the country. According to the labor force statistics reported by Turkish Statistical Institute (2019), the unemployment rate of people with high school degree has been much higher than those who are uneducated since 2005. The unemployment rate of people with high school degree was 13.9% in 2005, 15.9% in 2010, 12.5% in 2015 and 13.1% in 2018 while this rate was 4.9% in 2005, 6.0% in 2010, 6.2% in 2015 and 6.7% in 2018 for those who are uneducated. Therefore, the impact of the number of individuals

having completed high school education in the labor force on unemployment of natives is expected to be larger than the impact of uneducated labor force.

7. Conclusion and Policy Recommendations

The forced displacement of Syrian refugees was perceived as a temporary situation as the war in Syria was not considered to continue for such a long time. However, the conflict has intensified and become permanent, and the proportion of refugee population in the country has dramatically increased and exceeded 3.5 million by the end of May 2019. The policy framework for the refugee inflows has been created without taking into consideration the long term stay of the refugees in the country.

Although the Turkish government has made considerable progress in terms of identification of the needs of the refugees, several issues regarding their legal status and rights and also legal employment opportunities has remained unclear. As indicated previously, lack of work authorization for the first five years of the refugee influx has forced the great number of refugees. Thus, their migration is considered as a labor supply shock in the informal sector. The massive inflow of the refugees has been a great cause of concern across the country in terms of their effect on the labor market in Turkey. The purpose of this study is to estimate the impact of Syrian refugees on the labor market outcomes of Turkish natives by using the regional panel data. Consistent with the literature analyzing the refugee effects on employment of natives and economic theory, the estimated findings of this paper indicate that the refugee inflow has adversely affected informal employment of Turkish natives. In other words, Syrian refugees have caused a displacement of Turkish workers in the informal sector. On the other hand, the refugee influx is found to have a positive impact on Turkish workers' formal employment while there is no statistically significant effect of Syrian refugees on Turkish citizens' unemployment.

The main estimated findings of this paper confirm that the refugee inflows have reduced informal employment of Turkish natives. Thus, it can be argued that employment of Syrian refugees plays a crucial role in their economic integration but also in Turkish natives' labor market outcomes. Thus, policy makers should aim not only to integrate Syrians into labor markets but also address those local groups who have been adversely affected by the refugee influx and experienced economic insecurity.

First of all, as discussed earlier, granting a work permit is less likely to be the solution to tackle informal employment of Syrian refugees. Therefore, it is crucial to understand the reasons behind the relatively low number of granted work permits while more than half of the Syrian refugees in the country are of working age (DGMM, 2019). The Regulation on Work Permits of Foreigners under Temporary Protection enacted in 2016 states that the number of Syrian refugees who are employed in businesses should not be above 10% of the number of total employee population. The refugees under temporary protection can find a job only in the cities where they are registered for temporary protection. However, they are mostly settled in the provinces of the southeastern region such as Gaziantep, Adiyaman, Kilis which are characterized by high unemployment rates and informal employment rates. According to regional labor force statistics based on the NUTS-2 classification, the unemployment rate in TRC1 subregion including those provinces was 14.5% in 2016 and 15.3% in 2017 while the informal employment rate was 33.99% 38.71% over the same period (TurkStat, 2019a; Social Security Institution, 2019a). Therefore, this legislation is more likely to worsen the existing labor market problems of these provinces. Furthermore, in Kilis with a refugee density ratio above 80%, the number of people employed in the private sector is around 10,500 (Social Security Institution 2019b). Even if each business in Kilis would hire the refugees with 10% employment quota required by the

law on work permit, they could only employ 1050 of the 114,814 Syrians in the province. While this legal initiative can be considered as an improvement to enable the refugees to move from informal to formal jobs, at the same time, it creates barriers to formal employment of the refugees with these requirements regarding employment quota and geographical limitation and hence contributes to informal employment of the refugees. Therefore, these elements including employment quota and geographical limitation in the legal system are required further attention and improvement.

Secondly, the refugees with work permits have faced language barriers and skill mismatch problems in the formal sector. Initiatives focusing on language courses and skills and vocational training would help the refugees to increase their opportunities in the formal sector. Those vocational training programs should be accompanied by language courses to make the refugees familiar with the terms used at the workplace. Moreover, in order to plan effective and targeted vocational training programs, information on the occupational skills and educational attainment of the refugees should be obtained. However, lack of data creates another obstacle for formal employment of the refugees. Currently, the only available dataset on the refugees provided by the Directorate General Migration Management includes information about the number of the refugees by province, gender and age. On the other hand, more detailed information on the skill composition and occupational experience of Syrian refugees play a significant role in the match between labor force supply of the refugees and the demands of the Turkish labor market. More importantly, recognition of qualification and better understanding of labor market conditions will allow the Turkish authorities to design and adopt effective policies for the integration of the refugees into labor markets.

Thirdly, with regards to demand side, as indicated before the number of companies founded by Syrian entrepreneurs has dramatically risen. Offering loans with low interest rates would also contribute to formal employment of the refugees by creating an incentive for entrepreneurship. Furthermore, centers for consultation which provide information on the establishment of a business would be another option to support entrepreneurship and hence formal employment of the refugees. Since centralized information and knowledge transfer regarding Syrians' occupational experience and the current situation in the labor market would prevent loss of time and waste of resources, state agencies, employment services and non-governmental organizations (NGOs) should be in cooperation. However, cooperation should be not only at local levels, engagement of international community is also needed to reach all refugees across the country and provide targeted support programs regarding economic integration of the large number of Syrian refugees. Therefore, approaching both local and international organizations for the management of information regarding their occupational backgrounds and skill composition is crucial to achieve sustainable and long term integration of Syrian refugees into the Turkish labor market.

Finally, on the government side, there should be extensive improvements in permanent labor transition of the refugees. Considering Turkey's large informal sector and predominant informal employment of Syrian refugees, effective inspections and legal enforcement with fines are necessary but not sufficient to tackle the engagement of the refugees in the informal sector. In addition to strict control of employers, some incentives including reduced cost of social security contributions, tax reductions and exemptions would facilitate transition from informal to formal employment.

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Appendix

Table A1. NUTS-2 Subregions

NUTS-2 Subregions	Provinces
Erzurum Subregion (TRA1)	Erzurum, Erzincan, Bayburt
Ağrı Subregion (TRA2)	Ağrı, Kars, Iğdır, Ardahan
Malatya Subregion (TRB1)	Malatya, Elazığ, Bingöl, Tunceli
Van Subregion (TRB2)	Van, Muş, Bitlis, Hakkari
Gaziantep Subregion (TRC1)	Gaziantep, Adıyaman, Kilis
Şanlıurfa Subregion (TRC2)	Şanlıurfa, Diyarbakır
Mardin Subregion (TRC3)	Mardin, Batman, Şırnak, Siirt
İstanbul Subregion (TR10)	İstanbul
Tekirdağ Subregion (TR21)	Tekirdağ, Edirne, Kırklareli
Balıkesir Subregion (TR22)	Balıkesir, Çanakkale
İzmir Subregion (TR31)	İzmir
Aydın Subregion (TR32)	Aydın, Denizli, Muğla
Manisa Subregion (TR33)	Manisa, Afyon, Kütahya, Uşak
Bursa Subregion (TR41)	Bursa, Eskişehir, Bilecik
Kocaeli Subregion (TR42)	Kocaeli, Sakarya, Düzce, Bolu, Yalova
Ankara Subregion (TR51)	Ankara
Konya Subregion (TR52)	Konya, Karaman
Antalya Subregion (TR61)	Antalya, Isparta, Burdur
Adana Subregion (TR62)	Adana, Mersin
Hatay Subregion (TR63)	Hatay, Kahramanmaraş, Osmaniye
Kırıkkale Subregion (TR71)	Kırıkkale, Aksaray, Niğde, Nevşehir, Kırşehir
Kayseri Subregion (TR72)	Kayseri, Sivas, Yozgat
Zonguldak Subregion (TR81)	Zonguldak, Karabük, Bartın
Kastamonu Subregion (TR82)	Kastamonu, Çankırı, Sinop
Samsun Subregion (TR83)	Samsun, Tokat, Çorum, Amasya
Trabzon Subregion (TR90)	Trabzon, Ordu, Giresun, Rize, Artvin, Gümüşhane

Source: Presidency of Strategy and Budget, 2019

Table A2. Variable Definitions and Sources

Variable	Description	Source
Refugee density	This variable indicating the refugee concentration in each subregion classified by NUTS-2 has the value of 0 if the number of the refugees in the subregion is lower than 1000, while it has the value of 1, if this number is between 1000 and 25,000. The variable has the value of 2, if the number of refugees is between 25,000 and 50,000 while it takes the value 3, if this number is greater than 50,000.	DGMM and AFAD
lnuneducated	Log transformation of the number of individuals who are illiterate in each NUTS-2 subregion	TurkStat Regional Results of Labor Force Statistics
lnhighschool	Log transformation of the number of individuals who have a high school degree in each NUTS-2 subregion	TurkStat Regional Results of Labor Force Statistics
lnuniversity	Log transformation of the number of individuals who have tertiary education in each NUTS-2 subregion	TurkStat Regional Results of Labor Force Statistics
lnregional_gdp	Gross Domestic Product at current prices by kind of economic activity (2009 base) in each NUTS-2 subregion	TurkStat Regional Statistics