

AN ECONOMETRIC ANALYSIS OF THE IMPACT OF SYRIAN REFUGEES
ON CRIME IN TURKEY



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AN ECONOMETRIC ANALYSIS OF THE IMPACT OF SYRIAN REFUGEES
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on Crime in Turkey

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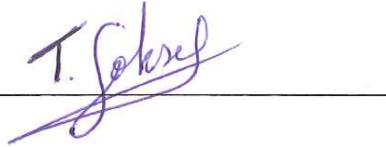
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July 2018

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ABSTRACT

An Econometric Analysis of the Impact of Syrian Refugees on Crime in Turkey

A common apprehension is that immigration raises crime rates. Yet, existing academic research has revealed no such outcome. Past and current studies discover that at the individual level, immigrants are not more prone to involve in criminal activities than the native-born. Notwithstanding general criticism claiming a linkage between immigration and crime, empirical research examining this relationship is inadequate, particularly at the macro-level. To address this matter, this study examines the link between migration and crime rates across Turkey's provinces with the Differences-and-Differences methodology. Using panel data on provinces, this paper presents empirical evidence on the impact of immigration on crime. After controlling for the demographic and economic characteristics of the provinces, I find that immigration does not increase total crime rates. Yet, the Syrian refugee density has an increasing impact on the crime of smuggling, which is a crime motivated by financial gains. Because smuggling represents a small part of all crimes, the effect on the overall crime rate is not significant. I also find that there is a significant negative impact of the Syrian refugee density on the number of crimes committed by females, especially the crime of assault.

ÖZET

Suriyeli Mültecilerin Türkiye’deki Suça Etkisi Üzerine

Ekonometrik Analiz

Göçün suç oranlarını arttırması yaygın bir endişedir. Fakat mevcut akademik araştırmalar böyle bir sonuç ortaya koymamaktadır. Geçmiş ve güncel çalışmalar, bireysel düzeyde, göçmenlerin suç işlemeye yerel halka oranla daha yatkın olmadığını keşfetmiştir. Göç ve suç arasında bir bağlantı olduğunu iddia eden genel eleştirilere rağmen bu ilişkiyi inceleyen ampirik araştırmalar özellikle makro düzeyde yetersiz kalmaktadır. Bu çalışma, bu konuyu ele almak için, göç ve illerin suç oranları arasındaki bağlantıyı DID metodu ile incelemektedir. Bu illerdeki panel verileri kullanarak göçün suç üzerindeki etkisine dair ampirik kanıt sunmaktadır. İllerinin demografik ve ekonomik özellikleri kontrol edildikten sonra, göçün toplam suç oranlarını arttırmadığı görülmektedir. Fakat, Suriyeli mülteci yoğunluğu, maddi kazanımlar tarafından teşvik edilen bir suç olan kaçakçılık suçu üzerinde önemli arttırıcı bir etkiye sahiptir. Kaçakçılık suçu tüm suçların küçük bir kısmı olduğu için, genel suç oranına etkisi önemli değildir. Ayrıca, Suriyeli mülteci yoğunluğu ile suç işleyen kadınların, özellikle de saldırı suçu işleyen kadınların sayısı arasında önemli bir negatif ilişki olduğu da görülmektedir.

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CHAPTER 1

INTRODUCTION

Immigration is expressed as an act of moving of individuals or communities, either within a country or across international borders. Any kind of population movement causing movement of people is included within this scope irrespective of its length, composition, and causes. The movement of people can be because of many reasons. People can be forced to move or the movement can be voluntarily. In consequence of armed conflicts, natural disasters, political or economic reasons, millions of people are leaving their countries in which they were born and raised. Therefore, the concept of immigration includes refugees, asylum seekers, economic migrants, irregular migrants and the groups of people being displaced due to several reasons.

Immigration is not a new phenomenon; it has continued throughout the human history. Almost all countries in the world have been influenced by the different types of immigration in their histories. Mass population movements were continuously observed, but today we are observing the highest levels of displacement on record. As a matter of fact, it is known that more than 65.6 million people have forced from their homes. Approximately 20 people are coercively displaced every minute as a consequence of conflict or oppression in the world (UNHRC,2017).¹

Turkey has hosted millions of immigrants during its history owing to its geographical position. Turkey is situated between some Middle Eastern and Asian countries. The conflicts in the East and the South of Turkey and the high living standards in the West of Turkey makes Turkey a bridge between them. As a result, Turkey has become an attraction point for those who escape from the instabilities and

¹See <http://www.un.org/en/sections/issues-depth/refugees/index.html>

conflicts. Syrian Civil War is one of the recent conflicts occurred in the South of Turkey, which caused millions of people fled from their countries. According to the United Nations (UN) figures, as of 31 May 2018, there were 5,648,631 registered Syrian refugees hosting in Syria's neighboring countries: Turkey, Egypt, Iraq, Jordan and Lebanon. 2 million of the Syrians registered by UNHCR in Egypt, Iraq, Jordan and Lebanon, 3.5 million Syrians registered by the Government of Turkey, as well as more than 33,000 Syrian refugees registered in North Africa (UNHRC, 2018)². As the UNHCR statistics show, Turkey is the top refugee-hosting country and the huge number of refugee inflows in Turkey brings about some issues.

Immigration is closely linked to political, economic, social and cultural life in the hosting country. Immigration have become a controversial issue in all destination countries for at least two fundamental reasons. One of the reason is that natives and immigrants may fight for the same jobs. Therefore, foreign immigrants are frequently accused of hurting the labor market opportunity of native workers especially the lowskill workers and for imposing a further burden on welfare expenses (Hanson, Scheve, and Slaughter, 2007; Facchini and Mayda, 2009). The second reason is that there are general concerns that immigrants rise crime rates. Although the economic literature has plenty of studies related to the first issue (Borjas, 1994; Bauer and Zimmermann, 2002; Card, 2005), in the context of the second issue there exist notably little research. The studies by Butcher and Piehl (1998a) for the US, Bell et al. (2013) for the UK and Bianchi et al. (2012) for Italy are exceptions.

In many countries, yet, citizens are much more concerned about the immigrant's impact on crime rates, rather than the problem of increased unemployment or taxes.

²See <http://data2.unhcr.org/en/situations/syria>

International surveys analyze the public views on immigration in seven developed countries: Australia, Canada, West Germany, East Germany, Great Britain, Japan, and the United States. Between 1995 and 2003, the portion of participants who consider immigrants raise crime is nearly 30%(Zhang, 2014). The public opinion about the effects of immigrants on crime rate is more severely adverse in Turkey. Many locals concern about their safety because of a large number of Syrian refugees. A survey conducted by Hacettepe University in provinces such as Adana, Ankara, and Gaziantep to show the common view through the statement of “Syrian refugees disturb the peace and cause depravity of public morals by being involved in crimes, such as violence, theft, smuggling, and prostitution.” 62.2 percent of the participants agree with the proposition, while those who disagree are 23.1 percent (Erdogan, 2014). The survey result is presented in Figure 1. Notwithstanding the broad public concern, evidence that the linkage between immigration and crime is ambiguous.

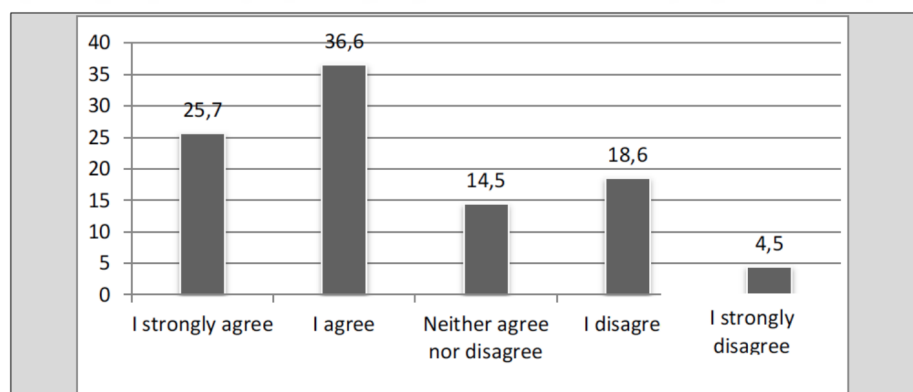


Figure 1. The survey research of Syrian refugees in public perception

Note: The data source for the figure of survey results is Erdogan (2014).

According to the economic theory of crime, people are rational and they take into consideration the pros and cons of participating in illegal activities. They

compare the opportunity costs of legal and illegal activities, then choose the one that makes them better off. The cost of crime is the likelihood of getting caught and the expected punishment (Zhang,2014). From the theoretical perspective, there is a link between immigration and criminal activity since, all else equal, people with lower outside options commit more crime (Becker, 1968) and it is clear that the legal labor market does not provide as much opportunities for immigrants as it does for natives. That may result in a higher propensity to participate in, illegal activities for immigrants. Furthermore, immigration can also increase crime rates by reducing the labor market opportunities of natives which may result in the increase in criminal activity among natives (Borjas, Grogger, and Hanson, 2010)). Thus immigration could have indirect effects on crime.

The most of the studies carried on immigration and crime implement the Chicago School of Sociologys social disorganization theory.³ The social disorganization theory classifies three fundamental properties (residential instability, economic deprivation, and ethnic heterogeneity) which can be used as indicators to estimate the degree to which an environment is socially disrupted (Sampson and Groves, 1989). The social disorganization theory claims that raises in disorder and, by implication, crime rates are more likely during periods of large-scale immigration. Therefore, there can be a positive relation between immigration and crime. However, the expected cost of committing a crime is likely higher for immigrants because they can be subject to deportation or strict punishments. Thus, there is also crime inhibiting aspects of immigration. There are sociological theories assert that immigration may increase crime by addressing opportunity structure, criminal

³See Lee, 2003; Martinez, 2002, 2008

subcultures, and social disorganization, however there are also sociological studies give valid reasons why immigration may have no effect on crime, and may even lessen it, at least at the aggregate level (Lee et al., 2001).

The present study aims to expand the knowledge on the relationship between crime and immigration by addressing the weaknesses of previous studies in this scope. First of all, in the past, research in this area has been imprecise due to its implementation of cross-sectional analyses for a restricted range of geographic areas. This study will use a longitudinal analytical design to evaluate the relationship between the immigration and crime rates. For the present study, I use annual data for Turkey's provinces during the 2006-2016 periods. I draw on the Turkish Statistical Institute (TURKSTAT) data to document the pattern of criminal offenses. Secondly, there are many individual-level studies of immigrant criminality, however, studies on macro-level aspects of immigration on crime rates are sparse. Although individual-level studies tend to prove that immigrants usually engage in less criminal activities compare to their native-born counterparts, the macro-level impact of immigration on crime rates are ambiguous. The present literature on the relationship between immigration and crime at the aggregate level gives inadequate information. For this reason, I assess the macro-level impact of changes in immigration concentration on changes in crime rates in the present study.

This paper attributes to the developing body of evidence about the relationship between immigration and crime. In the United States, pioneering research by Butcher and Piehl (1998a) points out no evidence that immigration raised crime across US counties during the 1980s, however, Spenkuch (2013) indicates an opposite result for following periods. His findings are consistent with the economic model of crime since he finds a positive correlation between the share of immigrants and the crimes

motivated by financial gain. Borjas, Grogger, and Hanson (2010) also reach that immigration raises crime, but only indirectly by increasing the criminal activity of native black males. In the United Kingdom, Bell, Fasani, and Machin (2013) study on the effect of two large immigrant waves which are asylum seekers and the post-2004 inflow from EU accession countries. They found that only the asylum seekers, which was more economically deprived people due to limited access to the official labor market, caused a rise in property crime. In Italy, Bianchi, Buonanno, and Pinotti (2012) point out that the causal effect of immigration on crime is not significantly different from zero. Lastly, Alonso-Borrego, Garoupa, and Vazquez (2012) reach that immigration raised crime across Spanish provinces. From the existing literature, the empirical evidence on the relationship between immigration and crime is unclear.

The remainder of this paper proceeds as follows. In the next section, I provide detailed background information on the Syrian refugee crisis and how Turkey dealt with the inflow of hundreds of thousands of refugees, started in 2011. Section 3 presents a review of relevant literature. Section 4 introduces and describes my data, followed by the empirical strategy presented in Section 5. I present and interpret the main results in Section 6, and Section 7 concludes.

CHAPTER 2

BACKGROUND

In Syria, the rebellion, which began in 2011 with peaceful demonstrations against the administration of Bashar al-Assad, turned into a civil war that led to demolitions in an entire country, hundreds of thousands of people were killed, and millions of people were fled from their homes. Together with the conflicts, intense human rights violations also emerged. The problem within the country has grown and it has come out of the internal matter. This quickly led regional and global actors to intervene in Syria. In the conflicts, around 350 thousand people were killed and cities were destroyed. The UK-based Syrian Human Rights Observatory, close to the insurgent, documented the death of 353 900 people by March 2018 and 106 thousand of them are civilians. This number does not include 56 900 people who are missing and thought to have died.⁴ The pre-war population of Syria was 22 million. With the war, at least 6.1 million Syrians were from their homes in the country, and 5.6 million people fled the country. According to the United Nations (UN) figures, as of 31 May 2018, there were 5,648,631 registered Syrian refugees hosting in Syria's neighboring countries: Turkey, Egypt, Iraq, Jordan and Lebanon. 2 million of the Syrians registered by UNHCR in Egypt, Iraq, Jordan and Lebanon, 3.5 million Syrians registered by the Government of Turkey, as well as more than 33,000 Syrian refugees registered in North Africa (UNHRC, 2018).⁵ Syria's neighboring countries had to deal with the greatest immigration movement of recent history. As the UNHCR statistics indicate, Turkey is the top refugee-hosting country.

⁴See <https://www.bbc.com/turkce/haberler-dunya-43414137>

⁵See <http://data2.unhcr.org/en/situations/syria>

The first Syrian refugees started to come to Turkey in April 2011. At that time Turkey's relations with the Syrian government had not yet been broken. Yet, when the Syrian government raised oppression and violence against Syrian civilians, relationships between the Turkish government and Syrian government deteriorated. Since the early stages of the Syrian war, Turkey implement an "open door" policy towards refugees fleeing Syria. However, initially, Syrian refugees came to Turkey were referred to as guests, not refugees because of the geographical restrictions of the 1951 Geneva Convention which is the basis of refugee legislation in Turkey. The 1951 Convention gives refugee status to people who come to Turkey from Europe. Being "guest" not refugee has two major implications. First, guests cannot apply for asylum in a third country, which restricts the opportunities of migrating to other countries. Second, unlike the refugee status, the guest status infers that refugees can be relocated by the Turkish authority without any constitutional process (Akgunduz et al,2015). In October 2014, Turkish government extended to refugees a legal framework known as temporary protection. This legal framework gave refugees a much clearer legal status. Temporary protection is an urgent and temporary safeguard measure implemented by the decision of the Council of Ministers in cases where there is massive immigration to the extent that it is not possible to effectively implement the individual international protection application mechanism. There are three basic criteria for temporary protection in international law standards: open door policy, non-return policy and providing basic needs⁶.

In May 2014, there are about 220,000 Syrian refugees housed in 22 camps along the Syrian border with another 515,000 registered urban refugees. The government

⁶See http://www.goc.gov.tr/files/files/2016_yiik_goc_raporu_haziran.pdf

together with the UNHCR put the total number of all the refugees in Turkey at around an estimated 900,000 (Kirisci, 2014). As of May 2018, the number of registered Syrian refugees in camp is 434,000. The number of registered Syrian refugees in total urban, peri-urban and rural is 5,214,550 (UNHRC,2018) and the number of Syrian refugees shows a dramatic increase in Turkey. The gradual increase in the number of Syrian refugees in Turkey can be observed from the Figure 2, which illustrates the number of registered Syrian refugees in Turkey from the beginning of 2013 to end of 2016.

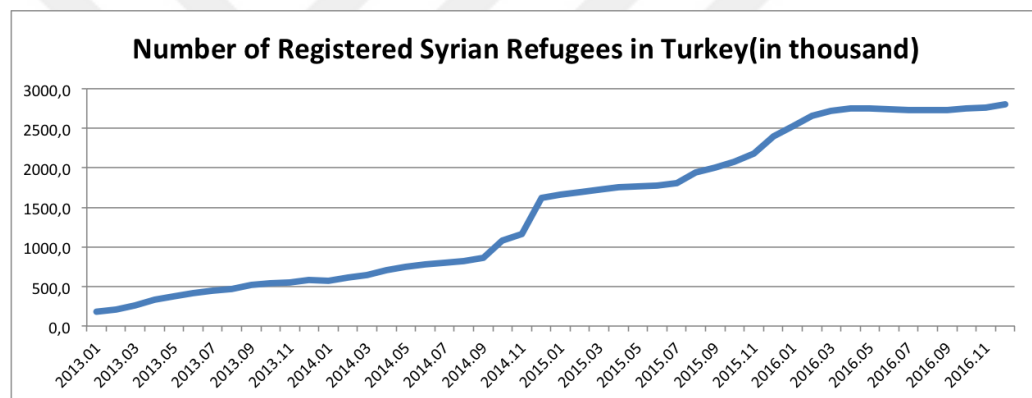


Figure 2. Number of registered Syrian refugees in Turkey

Note: The data source is UN Refugee Agency.

The present study uses a longitudinal data from 2006 to 2016, however, I rely on 4 years of data on the number of Syrian refugees which are 2013, 2014, 2015 and 2016. Since the number of Syrian refugees in Turkey for 2012 is unavailable and it is known that there were not a significant number of Syrian refugees before 2012. The figure shows that the registered Syrian refugees in Turkey almost reach 3 million by the end of 2016. Appendix A indicates the provincial distribution of Syrian refugees in Turkey as of December 2017. We can see that the Syrian population is dense

around the provinces close to the Syrian border and the metropolitan areas. The highest number is in Sanliurfa, Gaziantep, Hatay, and Istanbul, followed by Adana, Mersin, Kilis, Bursa, and Izmir.

These high numbers of refugees increase concerns about the security in Turkey. Table 1 presents the summary statistics for the demographic characteristics of the Syrian refugees in terms of gender, age, and educational and their comparison to the native population. The comparison year is 2013 because that it is the only year the data on the demographics of Syrian refugees is publicly available through a survey carried out by the Turkish Disaster and Emergency Management Presidency (AFAD).

Table 1. Demographic Characteristics of Natives vs Syrian Refugees - 2013 (%)

	Refugees		Natives
	In Camps	Out of Camps	
Gender			
Male	51.4	51.4	50.2
Female	48.6	48.6	49.8
Age			
1-12	36.7	34.0	21.3
15-18	16.3	14.9	10.1
19-54	42.4	45.0	52.7
55-64	2.8	3.7	8.2
65+	1.7	2.4	7.7
Education level			
Illiterate and No degree	17.8	28.3	10.6
Primary and Middle School	61.2	52.4	38.9
High School and Above	21.0	19.3	25.4

Note: The demographic characteristics of the Syrian refugees come from a survey conducted by AFAD in June 2013 (Syrian Refugees in Turkey, 2013 Field Survey). The demographic characteristics of natives are calculated using the Turkish Household Labor Force Survey 2013 data set. Ratio of natives in the age groups are approximate because the breakpoints of the data for refugees and natives are different. Therefore, I approximate native's age groups to be able to compare these two groups.

I think the comparison is significant since crime is correlated with these demographic characteristics. First, statistics are consistent in reporting that men involved in criminal activities more than women do. Second, the existing research has indicated that the people are between the age of 15 and 35 are especially likely to commit crime (Freeman, 1999). Lastly, there are many reasons to believe that education affects crime. For instance, schooling raises the returns to legal work, increasing the opportunity costs of illegal activities. Moreover, education can influence the decision to engage in crime by altering the individual's risk aversion level (Moretti, 2003). Therefore, by evaluating these demographic characteristics, we can observe which category are more likely to involve in illicit activities.

Table 1 shows that the proportion of men is higher for refugees than for locals, which can increase the likelihood of refugees being involved in illegal activities. However, the difference between the proportions of men in these two groups is not very large, so the difference probably does not make significant changes in participation in illegal activities. The age groups in Table 1 do not provide a clear indication since the age band of 19-54 are very large. That prevents us to compare the young populations. The reason of the wideband is that the only data available about the demographic characteristics of the Syrian refugees come from a survey conducted by AFAD in 2013 and the survey consists of these age groups. Therefore, I had to calculate the approximate native ratios according to this limitation. It is clear that, among refugees, the proportion of people below age 18 are significantly higher compared to natives. However, among natives, the proportion of people between age 19 and 54 are significantly higher compared to refugees. Although we can not exactly determine the proportions of 15-35 age people in these two group, we can observe that immigration raises the percentage of the population that is young and male and

that may increase crime rates. Since the findings of criminology show that crime follows a peculiar age pattern with offending rates being highest among teens and young adults. Another crime-fact is that men are engaged in criminal activity at significantly higher rates than women.

Lastly, we can observe from the Table 1, the education level among natives are higher than the refugees. That makes refugees more likely to involve in illegal activities. The comparison of the demographic characteristics of natives and refugees shows that refugees present a more crime-prone demographic profile. However, that does not mean that refugees have to commit more crime. Refugees have also disincentive factors, like deportation. That crime inhibiting aspects of immigration prevents refugees to commit crime. To evaluate, the refugees' macro effects on Turkey's security, we need to assess empirical results.

CHAPTER 3

RELATED LITERATURE

There is a large-scale literature on the economics of crime (Freeman, 1999) and on the economics of immigration (Borjas, 1999). However, there is relatively little is known regarding the effect of immigration on crime. The early literature is overwhelmingly micro-scale. They rely in large part on incarceration rates as a proxy for committing crime.

Moehling and Piehl (2009) examine the immigration and crime relationship in the 20th century by using prison population data collected by the Census Bureau. Their research uses a DID⁷ methodology using incarceration rates among native and non-native. They choose to examine the 1904 and 1923 prison data and observed that in 1904, prison commitment rates for severe offenses were considerably related by nativity for all ages, with the exception of ages 18 and 19, for which the incarceration rate for immigrants was greater than it was for the native-born. By 1930, migrants were less inclined than native-born to commit crimes at all ages 20 and older, yet, that was not valid for violent crimes (Moehling and Piehl 2009). As a result, the authors reach only very small differences between the incarceration rates of native and non-native borns.

Similarly, Butcher and Piehl (1998b) examine the micro-level relationship between immigration and crime by using data from the 1980 and 1990 Public Use Microdata Sample. They found that among the 18 to 24-year old men living in the US, immigrants were less likely than the native-born to be institutionalized. Additionally, recent immigrants are also less likely than the immigrants who spent

⁷Difference-in-Differences methodology

time in the US. Although the common opinion that is immigration causes higher crime rates, researches find that at the individual level, immigrants are not more inclined to engage in criminal activities than natives(Butcher and Piehl,1998b; Hagan and Palloni 1998; Martinez and Lee 2000).

There is a shifting focus from the individual-level immigrant-crime relationship to the macro-level immigration-crime relationship. Because the present research is concern about the macro effects of the immigration, I focus largely on the macro-level literature.

Butcher and Piehl (1998a) provide one of the first systematic analysis regarding the immigration and crime relationship. They use cross-sectional data (Uniform Crime Reports and CPS) across U.S. cities over the period 1980-1990 to measure the correlation between criminality and immigration across US cities. They found no correlation between immigration and crimes by using within-city variation after controlling for cities demographic features.

Kubrin and Ousey (2009) investigate the longitudinal relationship between immigration and violent crime across U.S. cities during the 1980 to 2000 period. They believed that the cross-sectional analyses do not measure over time change in immigration, crime, or other relevant social factors. Therefore, they pooled 1980, 1990, and 2000 Census data on crime, immigration, and several demographic, economic, and social factors for 159 large U.S. cities to estimate the longitudinal relationship between immigration and violent crime. They implemented a fixed effect linear regression model. The regression models examining whether within-city, over-time alteration in immigration influences within-city over-time alteration in violent crime rates. They found that immigration lowers violent crime rates by reinforcing intact (two-parent) family structures.

Borjas, Grogger, and Hanson (2010) discuss the spillover impact of immigration since they find a strong correlation between immigration, black wages, black employment rates, and black incarceration rates. They claim that the immigration increases unemployment and causes a decrease in wages among black men, thereby generating an increase in incarceration rates for them. For this analysis, they use data drawn from the 1960-2000 U.S. Censuses⁸. Their empirical analysis is limited to men aged 18 to 64. For their estimation, they assumed that black and white native workers are perfect substitutes, as well as native and immigrant workers are perfect substitutes. They found that immigration decrease employment and raise incarceration among native-born persons, with larger effects among African-Americans.

Bianchi, Buonanno, and Pinotti (2012) use police administrative panel data for 95 Italian provinces from 1990 to 2003 to determine the relationship between crime and immigration. First, they implement OLS regressions and with using the within province variation, they find a positive relationship between the number of immigrants and the incidence of property crimes and the rate of overall crime. They concern about the unbiasedness of OLS regression and to identifying causality, they adopt a Two-Stage-Least-Squares (2SLS) methodology that uses the (exogenous) supply-push⁹ component of migration by nationality as an instrument for shifts in the immigrant population across Italian provinces. When immigration is instrumented, the positive relationship between crime and immigration vanished, except for robberies.

⁸Their data are drawn from the 1960, 1970, 1980, 1990 and 2000 Integrated Public Use Microdata Samples (IPUMS) of the decennial Censuses.

⁹Supply-push components are all events in origin countries that raise the propensity to emigrate

Alonso-Borrego et al. (2012) investigates the crime immigration relationship for Spain because from 1999 to 2009, Spain had a large wave of immigration from different areas of the world and at the same time crime rates increased in Spain. The work was the first extensive study of the relationship between immigration and crime in Spain. By using Spanish provincial data on crime, they implement OLS, within-group, and GMM¹⁰ estimates. The authors find that there exists a positive correlation between immigration and crime in Spain and they added that it is not so much the number of immigrants but the particular features that appear to define the correlation between crime and immigration in Spain (Alonso-Borrego et al. (2012))

Bell, Machin, and Fasani (2013) analyze likely crime effects from two large waves of immigration occurred in the UK. The first of these waves was the late 1990s/early 2000s wave of asylum seekers, and the second the large inflow of workers from EU accession countries that took place from 2004¹¹. The response of crime rates to two very distinct immigration waves that hit the UK make them very appropriate for the empirical analysis of crime and immigration. Authors split offenses into two classes: Violent offenses and Property offenses¹². They used data for 2002-2008 for the asylum seekers and 2004-2008 for the A8 migrants. Their data are measured at the Local Authority (LA) level across England and Wales. They used panel data models and IV regressions to estimate the relationship between the two immigrant waves and recorded crime. By using different sources and empirical methods, they

¹⁰Where they used the instrument set which is composed of the second and third lags of the explanatory variables

¹¹This big worker inflow happened due to the opening up of the UK labor market to citizens of eight countries that joined the European Union in 2004. These accession countries (the so-called A8) were Poland, Hungary, Czech Republic, Slovakia, Slovenia, Latvia, Lithuania, and Estonia.

¹²Property crimes is the sum of Burglary, Robbery, Theft of a Motor Vehicle and Theft from a Motor Vehicle

reached a simple conclusion which is consistent with the theoretical framework. They found that the first wave led to a small rise in property crime, while the second wave had no such effect. There was no visible impact on violent crime for either wave. Authors also suggest that developing the poor labor market opportunities of asylum seekers generates crime reductions.

Spenkuch (2013) uses a decadal panel data of US counties from 1980 to 2000 to exhibit empirical evidence of the influence of immigration on crime. The measure of crime relies on agency-level data on the number of crimes reported to the police, as compiled by the Federal Bureau Of Investigation(FBI). He divided the available crime types in the reported crime data into two categories as violent and property crimes¹³. The author uses panel data regressions to relate the share of immigration to county-level crime rates. The parameter of interest of the methods is the elasticity of the rate of crime with respect to the population share of immigrants. Besides OLS, he also uses IV estimation. By instrumenting current immigration with past immigration patterns, he finds that an increase in immigration causes an increase in crime. His result is more noticeable among immigrants with meager labor opportunities and for crimes related to financial gains, such as motor vehicle theft and robbery. He concluded that a 10% rise in the share of immigration is estimated to cause to a rise in property crime rate of about 1.2%, while the rate of violent crimes remains substantially unchanged.

Zhang (2014) examines the causal linkages between immigration and crime in Canada by using panel data created from the Uniform Crime Reporting Survey¹⁴, the

¹³Violent crimes are murder, rape, aggravated assault, and robbery. The property crimes are burglary, larceny, and motor vehicle theft.

¹⁴The Uniform Crime Reporting Survey is the most reliable and the most widely used source of crime statistics in Canada.

master files of the Census of Canada¹⁵. This paper identifies immigrants by their years in Canada and sets three groups: new immigrants, recent immigrants, and established immigrants. The author implements First Difference Model and Instrumental Variable approach which is based on the historical ethnic distribution. OLS estimations gave an upward bias and lead to the incorrect conclusion that higher crime rate is associated with a higher share of immigrants. To correct the problem of the endogenous location choice of immigrants, he used IV strategy. He found that new immigrants do not have a significant influence on the property crime rate, yet with time spent in Canada, a 10% increase in the recent-immigrant portion or established-immigrant share diminishes the property crime rate by 2% to 3%. This implies that immigration has a spillover effect, such as changing neighborhood characteristics, which reduces crime rates in the long run (Zhang, 2014).

In sum, the literature at the individual level shows that immigrants are no more likely to involve in criminal activities than natives. The increasing literature at the aggregate level shows uncertain results since some studies present no relationship, some present a negative relationship, and some present a positive immigration-crime relationship.

¹⁵The Census of Canada master files covers years 1981, 1986, 1991, 1996, 2001 and 2006.

CHAPTER 4

DATA AND SUMMARY STATISTICS

For the analysis in this paper, I use the data of convicts received into prison by type of crime and province where the crime was committed. This data published by the Turkish Statistical Institute (TURKSTAT). The design of the data is panel and covers the period 2006 to 2016, except 2012, resulting in a total of 810 observations. The previous studies on this subject mostly focus on particular years, but I employ all available data from 2006 to 2016¹⁶ to capture any trend behavior. Moreover, I do not limit the data to particular regions, instead apply the methodology to all provinces in Turkey. My main crime categories for this analysis are all, homicide, assault, sexual crimes, kidnapping, theft, robbery, smuggling, defamation and crimes related with firearms and knives. Table 2 provides descriptive statistics of the crime types for the years 2006 to 2016. There is no clear pattern regarding the movement of crime numbers, but after the Syrian civil war which started in 2011, there is an increase in the total crime number¹⁷. The jump in the total crime number is most observable in 2013. The total crime number per 100000 individuals was about 153 in 2012 and it became about 211 in 2013.

¹⁶Except the year 2012 since there is no publicly available data regarding the number of Syrian refugees at province level for this year.

¹⁷The total crime number is indicated with the variable *all* in the tables.

Table 2. Descriptive Statistics of The Number of Committed Crimes - By Total Pop.

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Mean	Std.Dev.
All	111.416	172.158	107.067	102.464	119.995	107.189	152.717	210.924	219.743	214.280	235.193	159.377	52.746
Homicide	2.745	4.345	4.818	2.087	4.012	4.662	8.508	8.522	11.436	10.545	9.327	6.455	3.278
Assault	9.961	13.530	10.908	10.537	11.394	10.552	20.237	38.892	31.927	30.137	29.550	19.784	10.821
Sexual crimes	1.271	1.264	1.381	0.775	1.233	1.108	2.986	5.404	7.123	6.782	6.902	3.293	2.677
Kidnapping	0.379	0.497	0.529	0.481	0.761	0.968	1.193	3.108	4.358	3.432	3.853	1.778	1.560
Theft	9.474	10.647	9.693	7.935	8.853	8.625	15.812	29.143	38.492	38.218	39.659	19.686	13.653
Robbery	1.593	3.390	3.557	1.578	2.439	2.978	4.849	6.361	10.312	12.757	12.141	5.632	4.189
Smuggling	1.662	1.975	1.499	1.289	1.148	1.179	1.502	3.948	3.950	4.023	4.859	2.458	1.417
Defamation	1.682	2.061	1.812	1.521	1.645	1.333	2.204	4.795	4.412	3.992	4.673	2.739	1.404
Firearms	4.602	5.821	4.933	3.301	3.634	4.052	7.173	11.691	6.320	5.367	5.216	5.646	2.309

Note: Data source is TURKSTAT. The year columns show the number of committed crimes in 100000 population for each year. The last 2 columns show the mean and standard deviation of the committed crimes in 100000 population, respectively.

The descriptive statistics of the number of committed crimes by female and male are presented in Table 3 and 4, respectively.

Table 3. Descriptive Statistics of The Number of Committed Crimes - By Females

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Mean	Std.Dev.
All	2.949	5.573	3.605	3.926	4.583	4.234	4.976	7.446	7.903	7.696	8.456	5.577	1.958
Homicide	0.131	0.164	0.218	0.101	0.168	0.152	0.287	0.260	0.238	0.302	0.179	0.200	0.066
Assault	0.213	0.361	0.317	0.391	0.342	0.199	0.409	1.112	0.839	0.743	0.777	0.518	0.299
Sexual Crime	0.017	0.020	0.026	0.023	0.024	0.015	0.062	0.088	0.080	0.084	0.081	0.047	0.031
Kidnapping	0.013	0.043	0.017	0.051	0.057	0.37	0.065	0.127	0.138	0.119	0.172	0.107	0.102
Defamation	0.031	0.091	0.103	0.117	0.079	0.069	0.108	0.261	0.203	0.264	0.259	0.144	0.086
Firearms	0.032	0.053	0.105	0.019	0.022	0.017	0.044	0.073	0.032	0.034	0.063	0.045	0.027
Robbery	0.008	0.049	0.044	0.031	0.053	0.085	0.158	0.155	0.218	0.254	0.242	0.118	0.091
Smuggling	0.015	0.038	0.020	0.014	0.015	0.005	0.013	0.053	0.047	0.043	0.058	0.029	0.019
Theft	0.261	0.452	0.429	0.265	0.368	0.350	0.704	1.674	2.259	2.285	2.264	1.028	0.889

Note: Data source is TURKSTAT. The year columns show the number of committed crimes by females in 100000 population for each year. The last 2 columns show the mean and standard deviation of the committed crimes by females in 100000 population, respectively.

Turkish Household Labor Force Survey (LFS) does not contain information about Syrian refugees since they are not sampled in these surveys. The number of

Table 4. Descriptive Statistics of The Number of Committed Crimes - By Males

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Mean	Std.Dev.
All	103.178	159.959	99.119	94.762	110.654	97.078	148.333	217.589	214.361	200.652	219.267	151.359	53.232
Homicide	2.739	4.202	4.540	2.203	4.292	4.448	8.303	8.841	11.739	10.456	9.206	6.452	3.316
Assault	10.220	14.517	12.373	11.137	11.304	10.951	22.743	46.211	35.440	31.565	30.661	21.557	12.554
Sexual Crime	1.254	1.210	1.568	0.817	1.304	1.120	3.371	6.521	7.805	7.303	7.442	3.610	2.987
Kidnapping	0.385	0.586	0.542	0.499	0.847	0.917	1.531	3.676	4.933	4.030	4.248	2.018	1.797
Defamation	1.996	2.463	2.273	1.776	1.805	1.532	2.621	6.173	5.308	4.113	4.528	3.144	1.606
Firearms	4.099	4.646	4.107	2.789	3.011	3.582	6.573	11.308	5.977	5.041	4.905	5.094	2.362
Robbery	0.905	1.968	1.980	0.972	1.570	1.881	3.257	4.633	7.721	9.294	8.914	3.918	3.229
Smuggling	1.786	2.114	1.561	1.442	1.303	1.305	1.818	4.968	4.658	4.604	5.608	2.834	1.720
Theft	6.895	6.978	7.089	5.981	6.548	6.156	12.966	23.914	32.021	31.007	32.319	15.625	11.614

Note: Data source is TURKSTAT. The year columns show the number of committed crimes by males in 100000 population for each year. The last 2 columns show the mean and standard deviation of the committed crimes by males in 100000 population, respectively.

Syrian refugees used for this study come from different sources. The number of Syrian refugees for 2013 comes from the Disaster and Emergency Management Presidency of Turkey (AFAD). Erdogan (2014) provides the refugee numbers for 2014 and the Ministry of Interior Directorate General of Migration Management provides information on the number of Syrian refugees for 2015 and 2016. The number of refugees in this analysis starts from 2013, since the number of Syrian refugees in Turkey for 2012 is unavailable. Therefore I drop the year 2012 from the sample and for the Difference-in-Difference analysis, the years 2013, 2014, 2015 and 2016 are considered the treatment years. The years 2006, 2007, 2008, 2009, 2010, and 2011 are considered the pre-treatment years. Table 1 presents the demographic characteristics of the Syrian refugees. The statistics comes from a survey conducted by AFAD in June 2013 (Erdogan, 2014). The statistics are not at provincial level and not up to date. There is a lack of large-scale information about the characteristics of Syrian refugees. Fortunately, my empirical strategy does not rely on the accessibility of the Syrian refugee features.

The main variable of interest in this study is the Syrian refugee fraction and to obtain this variable I normalized the refugees numbers by the population of the province in the particular year. My dependent variables are crime rates, which are calculated by dividing the total number of each crime incidence with the total population of each province in the particular year. The number of crimes are the sum of convicted Turkish citizens and foreigners. Despite all my effort, the information that the Syrian refugees are included in this foreigner category is not explicitly given by neither TURKSTAT or The Ministry of Justice. However, as the Table 5 shows the fraction of crimes committed by foreigners shows an increasing pattern after the inflow of Syrian refugees. Thus, I can assume that the crimes committed by Syrian refugees are counted in the foreigner category. As a result, my data of crime includes the crimes carry out by Syrian refugees. With this assumption, I can examine the effects of Syrian refugees on crime in Turkey.

Appendix B shows the correlation matrix between the fraction of refugees over population and the ratio of reported crimes over population, distinguished by type of crime, across the 81 Turkish provinces during the period 2006-2016. The table reports that there exists a positive correlation between the Syrian numbers and some crime rates. The highest positive correlation with the number of Syrians is observed among the crime types of smuggling, robbery, and theft. These are crimes motivated by financial gain and the positive correlation between these crime types and refugee fraction is consistent with the economic theory of crime.

Table 5. The Fraction of The Convicted Foreigners to Total - By Year

	2009	2011	2012	2015	2016
All	0.001	0.003	0.004	0.006	0.005
Assault	0.001	0.001	0.000	0.000	0.001
Homicide	0.002	0.004	0.004	0.003	0.005
Kidnapping	0.000	0.001	0.000	0.001	0.004
Sexual Crimes	0.000	0.005	0.001	0.004	0.006
Defamation	0.000	0.000	0.000	0.000	0.000
Theft	0.002	0.005	0.003	0.006	0.006
Robbery	0.004	0.007	0.007	0.010	0.012
Firearms and knives	0.002	0.003	0.000	0.004	0.003
Smuggling	0.005	0.000	0.000	0.015	0.019

Note: Data source is TURKSTAT. Each column shows the fraction of convicted foreigners to total convicted population in particular year.

Table 6 summarizes the control variables that may influence both immigration and crime, along with province- and year-specific unobserved heterogeneity. I assembled annual observations for all 81 Turkish provinces during the period 2007-2016. Because of data unavailability, I could not add the year 2006. Therefore, the regressions, which contain the control variables in Table 6, use the provincial data from 2007 to 2016. The set of control variables are the potential determinants of crime. That are the female and male rates, male1539, education attainments, and total age dependency ratio. It is a known fact that men commit more crime than women, thus I control for female rate. Moreover, because young men are believed to be more prone to engage in illegal activities than the rest of the population (Freeman, 1999), I add the percentage of men aged 15-39, male 1539 as Bianchi et al (2012). I also consider three education categories as control variables. I categorize the educational attainments as Del Carpio et al (2015) did in their paper. These groups are low (less than completed primary education), medium (at least completed primary education but no high school completion) and high (high school completion and above). Lastly,

I want to add the unemployment rate as a control variable, however, there is no provincial data regarding unemployment covers the related periods. Therefore, instead of the unemployment rate, I add the total age dependency ratio as a control variable. Total age dependency ratio gives the proportion of the population not in the work-force. It presents the potential impacts of changes in population age structures for social and economic developments¹⁸. The next section will explain the empirical strategy of this paper.

Table 6. Descriptive Statistics of Demographic Characteristics of Natives-By Time

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
<u>Gender</u>										
Female	0.499	0.498	0.497	0.498	0.498	0.498	0.498	0.498	0.498	0.498
Male	0.501	0.502	0.503	0.502	0.502	0.502	0.502	0.502	0.502	0.502
Male1539	0.214	0.214	0.213	0.212	0.211	0.209	0.208	0.206	0.205	0.204
Total Age Dependency Ratio	50.364	49.508	49.246	48.886	48.419	48.033	47.647	47.597	47.567	47.158
<u>Education</u>										
Low Education	-	-	0.202	0.178	0.155	0.147	0.142	0.123	0.111	0.104
Medium Education	-	-	0.516	0.521	0.523	0.525	0.519	0.521	0.515	0.506
High Education	-	-	0.353	0.366	0.381	0.385	0.395	0.406	0.42	0.435

Note: Data source is TURKSTAT's Turkish Household LFS. Male1539 is the percent of the population comprised of males aged 15 to 39. The total age dependency ratio is the number of persons at "0-14" and "65 and over" age groups per 100 persons at "15-65" age group. Low education category measure the percent of the population with no formal education. People who have formal education less than high school are in the Medium education category. Lastly, Higher Education category is the ratio of population with high school and above.

¹⁸See http://www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/demographics/dependency_ratio.pdf

CHAPTER 5

EMPIRICAL METHODOLOGY

This chapter explains the identification strategy and econometric specifications that this paper based. I used the following estimating equation to estimate the impact of Syrian refugees on crime rates in Turkey.

$$crime_{p,t} = \alpha + \beta syrians_{p,t} + X'_{p,t}\theta + \mu_p + \tau_t + \varepsilon_{p,t}$$

where $crime_{p,t}$ denotes the total incidences of a particular crime per 100000 individuals in province p during year t . Thus, I call the variable $crime_{p,t}$, crime rate. $syrians_{p,t}$ is the fraction of total number of Syrians to natives. β is the main parameter of interest in this equation. That measures the change in the crime rates because of the change in the fraction of Syrian refugees in province p in year t . Thus, the main variable of interest in this study is $syrians_{p,t}$. The value of the variable $syrians_{p,t}$ is zero before 2013 since there is no provincial available data related the number of Syrians in 2012 and before that year these numbers are negligible.

Therefore, in DID model, years before 2012 are considered pre-treatment years, and the years 2013, 2014, 2015 and 2016 are considered the treatment years. $X'_{p,t}$ is a vector of additional province level covariates, which are female fraction, male1539, education levels and total age dependency rate. I add female rate in the analysis as a gender control variable. The variable male1539 is the percentage of male aged 15-39. The educational attainments are divided into three categories as low (less than completed primary education), medium (at least completed primary education but no high school completion) and high (high school completion and above).¹⁹ The control variable of total age dependency ratio gives the proportion of the population not in the work-force. Lastly, μ_p denotes a province fixed effect and τ_t a year fixed effect. These

¹⁹The categorization of the educational attainments is the same as in Del Carpio and Wagner (2015).

fixed effects control for unobserved factors that do not change within provinces and years. The addition of province fixed effects implies that identification comes from variation within a province over time and the addition of year fixed effects suggests that only deviations from annual averages are used for identification (Del Carpio and Wagner, 2015). The error term is given by $\varepsilon_{p,t}$.

The model in this paper uses a linear differences-in-differences (DID) model to estimate the effect of Syrian refugees by comparing different type of crime rates of each province with different refugee densities before and after of the inflow of Syrian refugees. I estimate the impact of Syrian refugees on 10 outcome variables. These variables are the rate of all crimes, homicide, assault, sexual crimes, kidnapping, defamation, theft, robbery, smuggling and the crimes related to firearms and knives. The source of identification in this analysis arises from the variation of refugee shares in provinces. This analysis is conducted on data from 81 provinces of Turkey.

In order to estimate any causal effect between the refugee densities and crime rates, common trend assumption is the key identifying assumption of DID estimation to ensure internal validity of DID estimation. Common trend assumption requires that in the absence of treatment, the difference between the treatment and control group is constant over time²⁰. In this analysis, the assumption requires that dependent variables which are the crime rates should have similar trends in all provinces before the treatment years. DID estimation is all about common trends and this assumption is very hard to fulfill (Angrist, 2014). However, Joshua Angrist (2014)²¹ states that “Samples that include many states and years allow us to relax the common trends

²⁰<https://www.mailman.columbia.edu/research/population-health-methods/difference-difference-estimation>

²¹He is a Professor of Economics at the Massachusetts Institute of Technology and the writer of *Mostly Harmless Econometrics* and *Mastering 'Metrics: The Path from Cause to Effect*.

assumption, that is, to introduce a degree of nonparallel evolution in outcomes between states in the absence of a treatment effect.”(p. 598). In my analysis, to relax the strict common trend assumption, I add 81 provinces and 11 years in the analysis²². Furthermore, I expand the baseline model with different specifications other than province and year fixed effects. These are 5-region²³ linear time trends, NUTS1 linear time trends, 5-region year fixed effects, and NUTS1 year fixed effects.²⁴

Figure 3 illustrates the trends of crime rates. The blue lines are the treated groups and the red lines are the control groups. The treated groups include the provinces which have more than 5% refugee density in 2015 and the control group includes the other provinces. The graphs show that before 2012, there were similar trends between the treated and control groups in the all crime type. Thus, the common trend assumption is substantially satisfied in this analysis.

²²See *Mastering 'Metrics: The Path from Cause to Effect* for further detail regarding the relaxing common trend assumption.

²³Region 1(Istanbul, West Marmara, Aegean, East Marmara), Region 2(West Anatolia, Mediterranean), Region 3(Central Anatolia), Region 4(West Black Sea, East Black Sea), Region 5(Northeast Anatolia, Central East Anatolia, Southeast Anatolia)

²⁴See Appendix C for detailed information about NUTS1, and NUTS2 regions.



Figure 3. Trends of the crime rates

Another problem with this empirical methodology could be the endogeneity. It assumes the treatment can be treated as a natural experiment. Thus, if Syrian refugees determine where to live in Turkey according to the crime rates of the provinces, the results from the model would be biased. However, it is not reasonable for Syrian refugees to determine where to live according to the crime rates of the provinces. We know that Syrian refugees live close to the southern border and in the metropolitan cities.

CHAPTER 6

RESULTS

This section displays and examines the estimated impact of the inflow of Syrian refugees on crime and discuss these results. I exercise the analysis to predict the effect of share of Syrian refugees to province-level crime rates. Tables 7 to 12 present the results of my regression analyses. The crime types included in this analysis are all, homicide, assault, sexual crimes, kidnapping, defamation, firearms and knives, robbery, smuggling, and theft. All regressions in this analysis are weighted by province population and standard errors are clustered at province level.

Tables 7 predicts the impact of Syrian refugees on total population's crime rates. The dependent variables of these regressions are given in the first column of the table. The interest variable is the refugee fraction and column (1) to (5) presents the regression coefficients of the independent variable. Controls are year fixed effect, province fixed effects, 5-region linear time trends, NUTS1 linear time trends, 5-region-year fixed effects, and NUTS1-year fixed effects. As I mentioned before, the reason for adding these controls is to relax the common trend assumption.²⁵ The regressions in column (1) control only year fixed effects. For many dependent variables such as assault, sexual crimes, and defamation, column (1) gives a significant impacts of refugee density on crime rate, however, these results change when controlling other variables. Smuggling is the only outcome variable which gives a consistent significant impact of the refugee density on the crime rates for all controls. Increasing the refugee fraction by one results in an increase in the people convicted of smuggling crime by 16.624 per 100000 when I control for year fixed

²⁵See Mastering Metrics: The Path from Cause to Effect for further detail regarding the relaxing common trend assumption.

effect, province fixed effects, and 5-Region Linear Time Trends. In other words, increasing the refugee fraction by 10 % results in increase the mean of people convicted of smuggling crime to 4.120 from 2.458 per 100000 individuals, which means the mean of people convicted of smuggling crime increase about 68%. The other controls give similar results for smuggling crime.

Table 7. Impact of Refugees on Crime - Full Sample - DID Estimates

Dependent Variable	(1)	(2)	(3)	(4)	(5)	Mean
All	18.832 (85.658)	-31.313 (73.076)	36.510 (63.419)	-28.021 (76.446)	58.517 (72.783)	159.377
Homicide	-1.185 (6.752)	-3.105 (6.466)	-0.416 (5.660)	-3.218 (6.821)	0.556 (6.032)	6.455
Assault	-27.253* (14.851)	-21.497 (14.389)	-1.913 (11.815)	-22.356 (14.395)	-3.051 (11.609)	19.784
Sexual Crimes	-10.959* (6.006)	-5.409 (4.794)	-1.792 (4.146)	-5.206 (5.336)	-0.829 (4.902)	3.293
Kidnapping	-6.150* (3.127)	-4.827** (2.385)	-2.478 (1.582)	-5.215** (2.614)	-2.384 (1.659)	1.778
Defamation	-5.945** (2.807)	-4.137 (2.487)	-1.612 (2.305)	-3.948 (2.825)	-0.895 (2.923)	2.739
Firearms and knives	1.791 (1.726)	0.162 (2.797)	4.116* (2.405)	-0.744 (2.688)	3.882*** (1.249)	5.646
Robbery	-4.446 (10.062)	-0.299 (8.902)	-2.455 (9.532)	1.485 (9.273)	-0.734 (11.537)	5.632
Smuggling	21.202*** (7.763)	16.624** (6.451)	18.874*** (5.056)	16.503** (7.445)	21.189*** (5.991)	2.458
Theft	-27.515 (23.618)	-31.617 (22.061)	-21.530 (20.481)	-30.882 (25.626)	-17.858 (26.426)	19.686
<i>Controls for</i>						
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	
5-Region Linear Time Trends	No	Yes	No	No	No	
NUTS1 Linear Time Trends	No	No	Yes	No	No	
5-Region-Year Fixed Effects	No	No	No	Yes	No	
NUTS1-Year Fixed Effects	No	No	No	No	Yes	

Note: Each cell indicates a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. All regressions are weighted by province population. The clustered standard errors at province level are in parentheses. A *, **, or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last column is the mean of the convicted people for the particular crime type per 100000 population.

Table 8 illustrates the effects of Syrian refugee fraction on males and females separately. The results of the male are consistent with the previous table, which include overall convicted population since the majority of the convicted people are male. However, the results for female are notably different from the results of the overall population. First of all, in the Table 7, an increase in the refugee fraction does not have a significant result in all crimes, the sum of all convicted people, however, in Table 8, an increase in the refugee fraction have a negative significant result in all crimes in columns (6)-(9). Additionally, an increase in the refugee fraction has a negative significant result in assault crime for all control variables. Increasing the refugee fraction by one results in a decrease in the women convicted of assault crime by 1.152 per 100000 when I control for year fixed effect, province fixed effects, and NUTS-1 year fixed effects. In other words, increasing the refugee fraction by 10 % results in decrease the mean of women convicted of assault crime to 0.403 from 0.518 per 100000 individuals, which means the mean of women convicted of assault crime decrease about 22%. The other controls give similar results for the assault crime among women.

Table 8. Impact of Refugees on Crime - By Gender - DID Estimates

Dependent Variable	MEN					WOMEN				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
All	8.471 (110.698)	-49.110 (68.178)	54.721 (61.881)	-60.326 (83.554)	99.952 (94.165)	151.359 (110.698)	-7.750** (3.754)	-8.780** (3.432)	-5.786** (2.879)	-7.685** (3.286)
Assault	-25.308* (14.460)	-20.039 (14.051)	-0.579 (11.552)	-21.127 (14.102)	-1.900 (11.332)	21.557 (11.332)	-1.945*** (0.462)	-1.458*** (0.425)	-1.334*** (0.347)	-1.229*** (0.433)
Firearms and knives	1.921 (1.728)	0.218 (2.824)	4.137* (2.467)	-0.653 (2.688)	3.924*** (1.316)	5.094 (1.316)	-0.130 (0.088)	-0.056 (0.094)	-0.021 (0.106)	-0.091 (0.091)
Homicide	-0.994 (6.651)	-2.828 (6.398)	-0.217 (5.601)	-2.942 (6.759)	0.734 (5.967)	6.452 (5.967)	-0.190 (0.159)	-0.277** (0.127)	-0.198 (0.127)	-0.276** (0.136)
Robbery	-4.262 (9.807)	-0.254 (8.734)	-2.471 (9.398)	1.455 (9.118)	-0.812 (11.446)	3.918 (11.446)	-0.184 (0.347)	-0.045 (0.270)	0.016 (0.265)	0.030 (0.255)
Smuggling	21.149*** (7.742)	16.732** (6.461)	18.995*** (5.079)	16.622** (7.456)	21.339*** (6.012)	2.834 (6.012)	0.053 (0.143)	-0.108 (0.141)	-0.122 (0.149)	-0.120 (0.113)
Theft	-23.571 (22.256)	-29.391 (21.050)	-19.983 (19.695)	-28.880 (24.368)	-16.634 (25.372)	15.625 (25.372)	-3.943*** (1.551)	-2.226* (1.328)	-1.547 (1.335)	-2.002 (1.648)
Sexual Crimes	-10.826* (5.953)	-5.289 (4.741)	-1.699 (4.089)	-5.104 (5.281)	-0.750 (4.839)	3.610 (4.839)	-0.133 (0.110)	-0.119 (0.098)	-0.093 (0.103)	-0.102 (0.097)
Kidnapping	-5.817* (2.986)	-4.558** (2.250)	-2.272 (1.467)	-4.928** (2.473)	-2.155 (1.533)	2.018 (1.533)	-0.334* (0.178)	-0.268 (0.173)	-0.207 (0.156)	-0.287 (0.196)
Defamation	-5.370** (2.621)	-3.610 (2.294)	-1.180 (2.130)	-3.386 (2.576)	-0.428 (2.677)	3.144 (2.677)	-0.574** (0.242)	-0.528** (0.234)	-0.432* (0.236)	-0.563* (0.294)
<i>Controls for</i>										
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5-Region Linear Time Trends	No	Yes	No	No	No	No	Yes	No	No	No
NUTS1 Linear Time Trends	No	No	Yes	No	No	No	No	Yes	No	No
5-Region-Year Fixed Effects	No	No	No	Yes	No	No	No	No	Yes	No
NUTS1-Year Fixed Effects	No	No	No	No	Yes	No	No	No	No	Yes

Note: Each cell corresponds to a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. All regressions are weighted by province population. The columns (1) to (5) are the regression results for male and the columns (6) to (10) are the regression results for female. The clustered standard errors at province level are in parentheses. A *, **, or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last columns for Men and Women are the mean of the convicted men and women for particular crime type per 100000 population, respectively.

I add additional control variables for robustness check. Tables 9 predicts the impact of Syrian refugees on total population's crime rates with additional controls. These controls are the female fraction, male 1539, three education categories, and total age dependency rate. The detailed information about these additional control variables are given in the Appendix D. With these additional controls, Table 9 gives similar results to Table 7, however, the magnitude of the coefficients of the interest variable for smuggling crime reduce. For instance, in Table 7 increasing the refugee fraction by one results in an increase in the people convicted of smuggling crime by 21.189 per 100000 when I control for year fixed effect, province fixed effects, and NUTS-1 year fixed effects, and the number becomes 15.552 with adding additional control variables. Table 10 illustrates the effects of Syrian refugee fraction with additional controls on males and females separately. Again, the results of Table 8 and Table 10 are similar with only one important difference. The magnitude of the interest variable's coefficient for most of the crime type decrease in the regressions with additional controls.

Table 9. Impact of Refugees on Crime - Full Sample with Additional Controls - DID Estimates

Dependent Variable	(1)	(2)	(3)	(4)	(5)	Mean
All	45.495 (52.697)	-12.081 (61.343)	49.273 (65.348)	-0.983 (53.420)	66.413 (55.862)	159.377
Homicide	-0.415 (6.107)	-2.416 (6.107)	0.411 (5.131)	-2.066 (6.282)	0.846 (5.292)	6.455
Assault	-15.658 (11.689)	-16.285 (12.287)	0.966 (12.538)	-16.106 (11.699)	-4.008 (10.744)	19.784
Sexual Crimes	-7.880 (4.802)	-3.609 (4.562)	-0.144 (4.192)	-4.130 (4.788)	-1.061 (4.561)	3.293
Kidnapping	-4.035 (2.460)	-3.726 (2.312)	-1.213 (1.443)	-3.741* (2.235)	-1.310 (1.361)	1.778
Defamation	-4.532** (1.896)	-3.250 (2.289)	-0.352 (2.545)	-3.537 (2.427)	-1.221 (2.730)	2.739
Firearms and knives	1.933 (1.776)	0.542 (2.330)	3.034 (2.140)	-0.428 (2.508)	2.938* (1.677)	5.646
Robbery	-2.335 (8.682)	1.751 (8.145)	-0.661 (9.078)	2.555 (8.311)	0.295 (10.139)	5.632
Smuggling	17.815*** (6.122)	10.924** (5.483)	13.444*** (3.794)	12.309** (6.026)	15.552*** (4.462)	2.458
Theft	-17.386 (17.653)	-27.264 (22.154)	-19.281 (22.287)	-25.504 (22.959)	-16.403 (24.553)	19.686
<i>Controls for</i>						
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	
5-Region Linear Time Trends	No	Yes	No	No	No	
NUTS1 Linear Time Trends	No	No	Yes	No	No	
5-Region-Year Fixed Effects	No	No	No	Yes	No	
NUTS1-Year Fixed Effects	No	No	No	No	Yes	

Note: Each cell corresponds to a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. Other control variables are female fraction, male1539, three education categories, and the total age dependency rate. All regressions are weighted by province population. The clustered standard errors at province level are in parentheses. A *, **, or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last column is the mean of the total convicted people for the particular crime type per 100000 population.

Table 10. Impact of Refugees on Crime - By Gender with Additional Controls - DID Estimates

Dependent Variable	MEN					WOMEN						
	(1)	(2)	(3)	(4)	(5)	Mean	(6)	(7)	(8)	(9)	(10)	Mean
All	53.191 (49.758)	-4.459 (59.261)	53.881 (63.650)	6.210 (51.204)	70.825 (54.081)	151.359	-7.696** (3.584)	-7.622*** (2.796)	-4.609*** (2.258)	-7.193** (2.807)	-4.411* (2.275)	5.577
Assault	-13.981 (11.413)	-14.877 (12.014)	2.344 (12.343)	-14.978 (11.462)	-2.861 (10.518)	21.557	-1.677*** (0.391)	-1.408*** (0.392)	-1.378*** (0.365)	-1.128*** (0.363)	-1.147*** (0.351)	0.518
Firearms and knives	1.998 (1.775)	0.585 (2.314)	3.031 (2.166)	-0.383 (2.471)	2.940* (1.663)	5.094	-0.065 (0.109)	-0.042 (0.102)	0.003 (0.104)	-0.045 (0.106)	-0.002 (0.112)	0.045
Homicide	-0.123 (6.023)	-2.093 (6.074)	0.628 (5.118)	-1.709 (6.239)	1.133 (5.261)	6.452	-0.292 (0.202)	-0.323* (0.173)	-0.217 (0.209)	-0.357* (0.188)	-0.287 (0.205)	0.200
Robbery	-2.304 (8.509)	1.594 (8.039)	-0.875 (9.013)	2.402 (8.190)	0.108 (10.070)	3.918	-0.031 (0.301)	0.157 (0.241)	0.215 (0.223)	0.153 (0.239)	0.187 (0.243)	0.118
Smuggling	17.802*** (6.121)	11.107*** (5.464)	13.655*** (3.748)	12.474*** (6.036)	15.772*** (4.470)	2.834	0.013 (0.169)	-0.183 (0.191)	-0.211 (0.214)	-0.165 (0.148)	-0.221 (0.160)	0.029
Theft	-14.230 (16.636)	-25.543 (21.173)	-18.320 (21.402)	-23.571 (21.768)	-14.938 (23.364)	15.625	-3.156** (1.312)	-1.721 (1.320)	-0.961 (1.484)	-1.933 (1.502)	-1.466 (1.817)	1.028
Sexual Crimes	-7.775 (4.766)	-3.516 (4.508)	-0.058 (4.122)	-4.049 (4.739)	-0.984 (4.503)	3.610	-0.105 (0.093)	-0.092 (0.093)	-0.086 (0.104)	-0.081 (0.087)	-0.077 (0.094)	0.047
Kidnapping	-3.743 (2.318)	-3.442 (2.178)	-0.972 (1.345)	-3.454 (2.111)	-1.044 (1.263)	2.018	-0.292 (0.181)	-0.285 (0.180)	-0.241 (0.167)	-0.287 (0.191)	-0.266 (0.204)	0.107
Defamation	-4.086** (1.738)	-2.693 (2.079)	0.159 (2.371)	-2.993 (2.180)	-0.724 (2.475)	3.144	-0.445** (0.220)	-0.556* (0.281)	-0.511 (0.312)	-0.545* (0.311)	-0.497 (0.374)	0.144
Controls for												
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	
5-Region Linear Time Trends	No	Yes	No	No	No		No	Yes	No	No	No	
NUTS1 Linear Time Trends	No	No	Yes	No	No		No	No	Yes	No	No	
5-Region-Year Fixed Effects	No	No	No	Yes	No		No	No	No	No	No	
NUTS1-Year Fixed Effects	No	No	No	No	Yes		No	No	No	No	Yes	

Note: Each cell corresponds to a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. Other control variables, female fraction, male fraction, three education categories, and the total age dependency rate, are added into these regressions. All regressions are weighted by province population. The clustered standard errors at province level are in parentheses. A *, ** or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last columns for Men and Women are the mean of the convicted men and women for particular crime type per 100000 population, respectively.

I have also carried out a robustness test similar to Akgunduz et al. (2015) exercise in their analysis. Robustness checks results are presented in Table 11 and 12. I check robustness by dropping Istanbul from the sample as Akgunduz et al. (2015) did in their study. They drop Istanbul from their sample since, after the inflow of Syrian refugees in Turkey, they relocated to the larger cities in the west part of Turkey and Istanbul hosts most part of these refugees.²⁶

Table 11 indicates the impact of refugees on crime with excluding Istanbul from the sample. Excluding Istanbul from the sample does not change the outcome significantly. The positive significant correlation between the refugee fraction and the crime of smuggling remains the same. Table 12 illustrates the effects of Syrian refugee fraction on males and females separately when I exclude Istanbul from the sample. The results of males are almost the same as the overall populations result in Table 10. The results for females show that the positive impact of the refugee fraction on the crime of assault remains significant for females with the exclusion of Istanbul from the sample. The reason for the outcome could be refugee womens involving less assault crime compared to native women.

²⁶See Akgunduz et al. (2015) for further detail.

Table 11. Impact of Refugees on Crime -Excluding Istanbul-DID Estimates

Dependent Variable	(1)	(2)	(3)	(4)	(5)	Mean
All	5.475 (92.098)	9.705 (60.920)	39.398 (60.843)	8.730 (66.231)	58.517 (72.338)	159.377
Homicide	-1.630 (6.887)	-1.800 (6.483)	-0.395 (5.734)	-1.667 (6.728)	0.556 (5.995)	6.455
Assault	-30.417* (15.467)	-12.628 (12.519)	-1.716 (11.357)	-14.574 (12.877)	-3.051 (11.538)	19.784
Sexual Crimes	-11.702* (6.341)	-3.058 (4.086)	-1.762 (4.179)	-2.366 (4.333)	-0.829 (4.872)	3.293
Kidnapping	-6.738** (3.243)	-3.352* (1.903)	-2.468 (1.621)	-3.408* (1.880)	-2.384 (1.649)	1.778
Defamation	-6.399** (2.987)	-2.730 (2.122)	-1.577 (2.286)	-2.436 (2.434)	-0.895 (2.906)	2.739
Firearms and knives	1.223 (1.832)	1.570 (2.339)	4.214* (2.273)	0.073 (2.419)	3.882*** (1.241)	5.646
Robbery	-3.413 (9.619)	-0.013 (8.806)	-2.026 (9.376)	1.312 (9.404)	-0.734 (11.466)	5.632
Smuggling	20.531** (7.808)	17.589*** (6.456)	18.770*** (5.119)	17.790** (7.376)	21.189*** (5.954)	2.458
Theft	-30.897 (25.006)	-20.979 (19.455)	-21.517 (20.589)	-17.991 (22.210)	-17.858 (26.264)	19.686
<i>Controls for</i>						
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	
5-Region Linear Time Trends	No	Yes	No	No	No	
NUTS1 Linear Time Trends	No	No	Yes	No	No	
5-Region-Year Fixed Effects	No	No	No	Yes	No	
NUTS1-Year Fixed Effects	No	No	No	No	Yes	

Note: Each cell corresponds to a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. Other control variables are female fraction, male1539, three education categories, and lastly the total age dependency rate. All regressions are weighted by province population. From the sample of these regressions, Istanbul is dropped for robustness check. All regressions are weighted by province population. The clustered standard errors at province level are in parentheses. A *, **, or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last column is the mean of the convicted people for the particular crime type per 100000 population.

Table 12. Impact of Refugees on Crime By Gender-Excluding Istanbul-DID Estimates

Dependent Variable	MEN					WOMEN						
	(1)	(2)	(3)	(4)	(5)	Mean	(6)	(7)	(8)	(9)	(10)	Mean
All	14.061 (88.410)	16.283 (58.605)	45.104 (58.535)	14.461 (64.009)	62.583 (69.903)	151.359	-8.586** (3.991)	-6.578** (2.691)	-5.707** (2.767)	-5.731** (2.633)	-4.065 (2.750)	5.577
Assault	-28.362* (15.072)	-11.420 (12.242)	-0.366 (11.104)	-13.616 (12.633)	-1.900 (11.262)	6.452	-2.055*** (0.464)	-1.209*** (0.375)	-1.350*** (0.340)	-0.958** (0.404)	-1.152*** (0.373)	0.518
Firearms and knives	1.357 (1.832)	1.622 (2.365)	4.234* (2.338)	0.162 (2.416)	3.924*** (1.308)	5.094	-0.134 (0.088)	-0.052 (0.094)	-0.020 (0.107)	-0.089 (0.091)	-0.042 (0.117)	0.045
Homicide	-1.462 (6.790)	-1.525 (6.417)	-0.209 (5.685)	-1.335 (6.656)	0.734 (5.931)	6.452	-0.169 (0.149)	-0.275** (0.124)	-0.186 (0.122)	-0.332*** (0.132)	-0.178 (0.134)	0.200
Robbery	-3.220 (9.359)	-0.022 (8.645)	-2.045 (9.250)	1.241 (9.248)	-0.812 (11.376)	3.918	-0.193 (0.350)	0.009 (0.255)	0.019 (0.261)	0.071 (0.247)	0.079 (0.258)	0.118
Smuggling	20.481** (7.788)	17.693*** (6.462)	18.888*** (5.141)	17.904** (7.383)	21.339*** (5.976)	2.834	0.050 (0.143)	-0.104 (0.141)	-0.118 (0.148)	-0.114 (0.114)	-0.150 (0.119)	0.029
Theft	-26.653 (23.571)	-19.525 (18.613)	-19.889 (19.781)	-17.014 (21.185)	-16.634 (25.216)	15.625	-4.244*** (1.623)	-1.453 (1.211)	-1.629 (1.343)	-0.978 (1.499)	-1.223 (1.850)	1.028
Sexual Crimes	-11.557* (6.277)	-2.967 (4.033)	-1.667 (4.122)	-2.296 (4.278)	-0.750 (4.809)	3.610	-0.145 (0.118)	-0.091 (0.098)	-0.095 (0.103)	-0.070 (0.096)	-0.079 (0.102)	0.047
Kidnapping	-6.374** (3.105)	-3.144* (1.786)	-2.258 (1.507)	-3.193* (1.756)	-2.155 (1.523)	2.018	-0.364** (0.178)	-0.208 (0.158)	-0.209 (0.157)	-0.215 (0.182)	-0.229 (0.196)	0.107
Defamation	-5.797** (2.797)	-2.263 (1.954)	-1.139 (2.107)	-1.938 (2.221)	-0.428 (2.661)	3.144	-0.602*** (0.248)	-0.467** (0.216)	-0.438* (0.238)	-0.498* (0.275)	-0.467 (0.336)	0.144
Controls for												
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5-Region Linear Time Trends	No	Yes	No	No	No	No	No	Yes	No	No	No	No
NUTS1 Linear Time Trends	No	No	Yes	No	No	No	No	No	Yes	No	No	No
5-Region-Year Fixed Effects	No	No	No	Yes	No	No	No	No	No	No	No	No
NUTS1-Year Fixed Effects	No	No	No	No	Yes	Yes	No	No	No	Yes	No	Yes

Note: Each cell corresponds to a separate regression, where the dependent variables are regressed on refugee fraction conditional on control variables as indicated above. Other control variables are female fraction, male fraction, three education categories, and the total age dependency rate. From the sample of these regressions, Istanbul is dropped for robustness check. The columns (1) to (5) are the regression results for male and the columns (6) to (10) are the regression results for female. All regressions are weighted by province population. The clustered standard errors at province level are in parentheses. A *, **, or *** indicates significance at the 90%, 95% or 99% levels, respectively. The last columns for Men and Women are the mean of the convicted men and women for particular crime type per 100000 population, respectively.

CHAPTER 7

SUMMARY AND CONCLUSION

A common apprehension is that immigration raises crime rates. Yet, existing academic research has revealed no such outcome. Historical and present study discovers that at the individual level, immigrants are not more prone to involve in criminal activities than the native-born. Notwithstanding general criticism claiming a linkage between migration and crime, empirical research examining this relationship is inadequate, particularly at the macro-level. To address these matters, this study examines the link between immigration and crime rates across Turkey's provinces with the Differences-and-Differences methodology.

The Syrian civil war caused more than 5.6 million people fled from their country and as one of the closest neighbor, Turkey received more than 3.5 million Syrian refugees. The increase in the number of refugees in Turkey with Syrian Civil war gives a motivation to examine the effect of immigration on crime in Turkey.

The present study aims to expand the knowledge on the relationship between crime and immigration by addressing the weaknesses of previous studies in the scope. First of all, in the past, research in this area has been imprecise due to its implementation of cross-sectional analyses for a restricted range of geographic areas. This study uses a longitudinal analytical design to evaluate the relationship between the immigration and crime rates. For the present study, I use annual data for Turkey's provinces during the 2006-2016 periods. I draw on the Turkish Statistical Institute (TURKSTAT) data to document the pattern of criminal offenses. Secondly, there are many individual-level studies of immigrant criminality, however, studies on macro-level aspects of immigration on crime rates are sparse. Although individual-level studies tend to prove that immigrants usually engage in less criminal

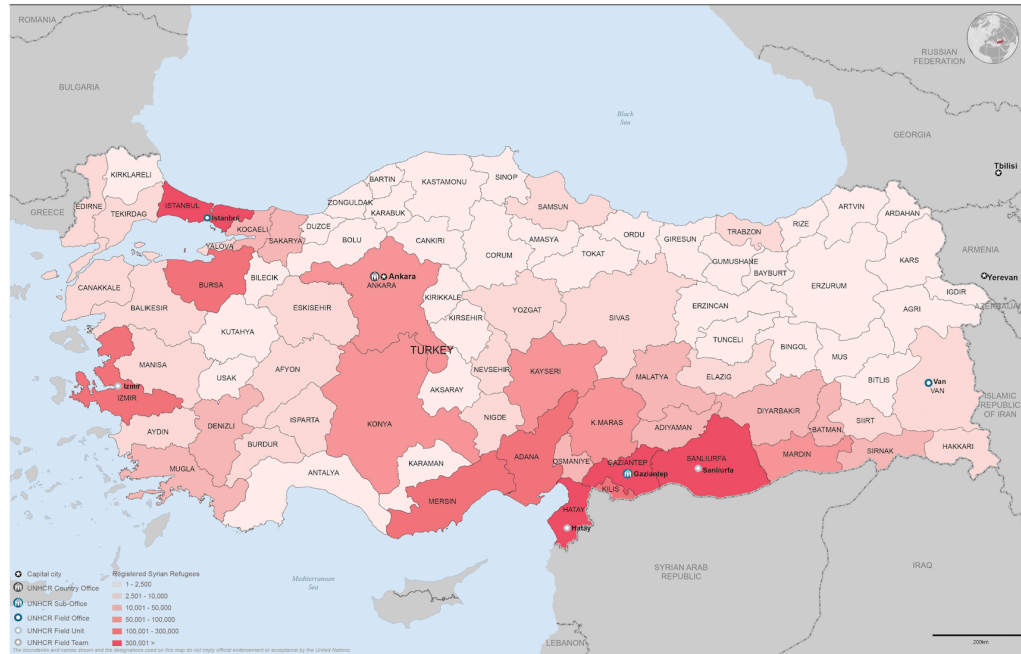
activities compare to their native-born counterparts, the macro-level impact of immigration on crime rates are ambiguous. The present literature on the relationship between immigration and crime at the aggregate level gives inadequate information. For this reason, I assess the macro-level impact of changes in immigration concentration on changes in crime rates in the present study.

Using panel data on Turkey's provinces, this paper presents empirical evidence on the impact of migration on crime. After controlling for the demographic and economic characteristics of Turkey's provinces, I find that immigration does not increase total crime rates. Yet, Syrian refugee density has an increasing impact on the crime of smuggling, which is a crime motivated by financial gains. Because smuggling represents a small part of all crimes, the effect on the overall crime rate is not significant. I also find that there is a significant negative impact of the Syrian refugee density on the fraction of crimes committed by females.

APPENDIX A

THE DISTRIBUTION OF SYRIAN REFUGEES IN TURKEY

UNHCR Turkey:
Provincial Breakdown Syrian Refugees in Turkey
as of 07 December 2017



APPENDIX B

CORRELATION MATRIX

	Ratio	Total	Homicide	Assault	Sexual	Kidnapping	Defamation	Theft	Robbery	Smuggling	FireArms
Total	0.1084	1.000									
Homicide	0.1440	0.7398	1.000								
Assault	0.0375	0.8260	0.7351	1.000							
Sexual	0.1085	0.7545	0.7671	0.7980	1.000						
Kidnapping	0.0212	0.6685	0.6857	0.7431	0.7796	1.000					
Defamation	0.0037	0.7559	0.5925	0.8403	0.7077	0.6464	1.000				
Theft	0.1719	0.7914	0.7438	0.7367	0.7939	0.6892	0.6189	1.000			
Robbery	0.2262	0.7071	0.7320	0.6074	0.7104	0.6162	0.4883	0.8483	1.000		
Smuggling	0.4053	0.1982	0.2370	0.1660	0.1962	0.1504	0.0552	0.2764	0.2778	1.000	
FireArms	0.0456	0.4565	0.4702	0.5590	0.3575	0.3397	0.4428	0.3667	0.2934	0.1421	1.000

Note: This table reports the correlation matrix between refugee fraction and the fraction of reported crimes over population, distinguished by type of crime, across the 81 Turkish provinces during the period 2006-2016.

APPENDIX C

NUTS LEVEL REGIONAL DIVISIONS

NUTS-1/Region	NUTS-2/Subregion	NUTS-3/Province
Istanbul	Istanbul	Istanbul
West Marmara	Tekirdag	Tekirdag, Edirne, Kırklareli
	Balıkesir	Balıkesir, Canakkale
	Izmir	Izmir
Aegean	Aydin	Aydin, Denizli, Mugla
	Manisa	Manisa, Afyonkarahisar, Kutahya, Usak
East Marmara	Bursa	Bursa, Eskisehir, Bilecik
	Kocaeli	Kocaeli, Sakarya, Duzce, Bolu, Yalova
West Anatolia	Ankara	Ankara
	Konya	Konya, Karaman
Mediterranean	Antalya	Antalya, Isparta, Burdur
	Adana	Adana, Mersin
	Hatay	Hatay, Kahramanmaraş, Osmaniye
Central Anatolia	Kirikkale	Kirikkale, Nevsehir, Aksaray, Nigde, Kirsehir
	Kayseri	Kayseri, Sivas, Yozgat
West Black Sea	Zonguldak	Zonguldak, Karabuk, Bartin
	Kastamonu	Kastamonu, Cankiri, Sinop
	Samsun	Samsun, Tokat, Corum, Amasya
East Black Sea	Trabzon	Trabzon, Ordu, Giresun Rize, Artvin, Gumushane
Northeast Anatolia	Erzurum	Erzurum, Erzincan, Bayburt
	Agri	Agri, Kars, Igdir, Ardahan
Central East Anatolia	Malatya	Malatya, Elazig, Bingol, Tunceli
	Van	Van, Mus, Bitlis, Hakkari
Southeast Anatolia	Gaziantep	Gaziantep, Adiyaman, Kilis
	Sanliurfa	Sanliurfa, Diyarbakir
	Mardin	Mardin, Siirt, Batman, Sirnak

APPENDIX D

VARIABLES

- Refugee fraction: This is the variable that is used to identify the causal effect of immigration on natives labor market outcomes. It is calculated as the number of Syrian refugees over the total Turkish population for each provinces.
- All: The total number of convicts received into prison per 100000 individuals.
- Homicide: The number of people commits the crime of homicide per 100000 individuals.
- Assault: The number of people commits the crime of assault per 100000 individuals.
- Sexual Crimes: The number of people commits sexual crimes per 100000 individuals.
- Kidnapping: The number of people commits the crime of kidnapping per 100000 individuals.
- Defamation: The number of people commits the crime of defamation per 100000 individuals.
- Firearms and knives: The number of people commits crimes related to firearms and knives per 100000 individuals.
- Robbery: The number of people commits the crime of robbery per 100000 individuals.

- Smuggling: The number of people commits the crime of smuggling per 100000 individuals.
- Theft: The number of people commits the crime of theft per 100000 individuals.
- Female Fraction: The proportion of female in the total population.
- Male1539: The percentage of men aged 15-39 in total population.
- Education: The education categories are low (less than completed primary education), medium (at least completed primary education but no high school completion) and high (high school completion and above)
- Total Age Dependency Rate: The proportion of the population not in the work-force, i.e the ratio of the sum of young and elderly people who are younger than 15 and older than 64, respectively.

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