

THE IMPACT OF SYRIAN REFUGEES ON TURKISH CHILD LABOR MARKET

A Master's Thesis

by

LORIS GOCKAJ

Department of Economics
İhsan Doğramacı Bilkent University
Ankara
February 2022

to my family



THE IMPACT OF SYRIAN REFUGEES ON TURKISH CHILD LABOR
MARKET

The Graduate School of Economics and Social Sciences
of
İhsan Doğramacı Bilkent University

by

LORIS GOCKAJ

In Partial Fulfillment of the Requirements for the Degree of
MASTER OF ARTS IN ECONOMICS

THE DEPARTMENT OF ECONOMICS
İHSAN DOĞRAMACI BİLKENT UNIVERSITY
ANKARA

February 2022

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assist. Prof. Şaziye Pelin Akyol
Supervisor

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assoc. Prof. Çağla Ökten
Examining Committee Member

I certify that I have read this thesis and have found that it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Arts in Economics.

Assist. Prof. Belgi Turan
Examining Committee Member

Approval of the Graduate School of Economics and Social Sciences

Prof. Dr. Refet S. Gürkaynak

Director

ABSTRACT

THE IMPACT OF SYRIAN REFUGEES ON TURKISH CHILD LABOR MARKET

Gockaj, Loris

M.A., Department of Economics

Supervisor: Assist. Prof. Şaziye Pelin Akyol

February 2022

During the last decade, nearly 3.7 million Syrian found refuge in Turkey, making it the largest refugee host country in the world. Different from other refugee-hosting countries, almost all the refugees live in urban areas, which makes it easier for them to benefit from social and economic opportunities. This paper analyzes the impact of Syrian refugees on young (15-17 years) native's labor market outcomes using Turkish Household Labor Force Surveys from 2004-2018. We employ a difference-in-difference IV methodology, using the variation in refugees to native ratio and a distance instrument. We find a positive effect on native boys' employment and no effect on native girls. In addition, there is no effect on child labor and working hours for both males and females, while there is a positive effect on boys' labor force participation only. Controlling for the heterogeneity of refugee's effect using household head education level, we find a positive effect on native boy's employment and labor force participation when the household head is less educated.

Keywords: Syrian Refugee, Child Worker, Child Labor, Labor Force, Working Hours.

ÖZET

SURİYELİ MÜLTECİLERİN TÜRKİYE’DEKİ ÇOCUK İŞÇİLİĞİNE ETKİLERİ

Gockaj, Loris

Yüksek Lisans, İktisat Bölümü

Tez Danışmanı: Doç. Dr. Şaziye Pelin Akyol

Şubat 2022

Türkiye, son on yılda yaklaşık 3.7 milyon Suriyeli mülteci misafir ederek dünyanın en büyük mülteci barındıran ülkesi oldu. Diğer ülkelerin aksine, neredeyse tamamı kentsel bölgelerde yaşayan mülteciler sosyal ve ekonomik fırsatlardan daha kolay yararlanıyor. Bu çalışmada, 2004-2018 Türkiye Hanehalkı İşgücü Araştırması’nı kullanarak Suriyeli mültecilerin 15-17 yaş aralığındaki yerli nüfusun işgücü piyasası çıktıları üzerindeki etkilerini araştırıyoruz. Mültecilerin göç ettikleri şehirler ile yerleştikleri şehirler arasındaki mesafeyi aracı değişken olarak kullanarak Farkların-Farkı yöntemini uyguladık. Tahmin sonuçlarına göre, genç erkeklerin istihdam oranında artış, genç kızların istihdam oranında ise hiçbir değişiklik bulunmadığını tespit ettik. Çocuk işçiliği ve çalışma saatleri üzerinde herhangi bir etki gözlenmezken, erkek çocukların işgücüne katılımını artırdığını bulduk. Ek olarak, sonuçların hane reisinin eğitim düzeyine göre farklılık gösterdiğini, az eğitilmiş hane reisinin bulunduğu hanelerde erkek çocukların istihdam edilme ve işgücüne katılıma ihtimalinin arttığını gösterdik.

Anahtar Sözcükler: Suriyeli Mülteciler, Çocuk İşçi, Çok İşçiliği, İşgücü, Çalışma Saatleri

ACKNOWLEDGMENTS

First and foremost, I would like to express my utmost gratefulness to my advisor, Assist. Prof. Dr. Pelin Akyol, for accepting me to work under her supervision when I was having a difficult time, and for her guidance and motivation making me enjoy my work and give my best effort. I would like to thank my examining committee members, Assoc. Prof. Dr. Çağla Ökten and Assist. Prof. Dr. Belgi Turan for their valuable comments, and suggestions for further research.

I wish to thank all my dear professors at Bilkent Economics for their guidance during my master's degree. A special thanks to my colleagues Zeynep Yoldaş and Merve Demirel for their support and help. My deepest thanks to my friends, Klajdi Hoxha, Sıla Erikci, Halilcan Kola, Klint Mane, Ridëll Logli, Ani Pole, and Xhulian Liçkollari for their support and help.

I would like to dedicate this thesis to my family, who have always supported me in every aspect of my life. I am forever indebted to my family for always believing in me. Finally, and above all, I cannot begin to express my unfailing gratitude and love to my life partner, Adelina Beqiri, for her unconditional love and support she has given me throughout this process.

TABLE OF CONTENTS

ABSTRACT	iv
ÖZET	v
ACKNOWLEDGMENTS	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	ix
LIST OF FIGURES	xi
CHAPTER 1: INTRODUCTION	1
CHAPTER 2: RELATED LITERATURE	6
CHAPTER 3: BACKGROUND INFORMATION	9
3.1 Syrian Refugees	9
3.2 Child Worker in Turkey	11
CHAPTER 4: DATA AND SUMMARY STATISTICS	14
CHAPTER 5: METHODOLOGY	18
CHAPTER 6: RESULTS	22
6.1 Labor Market Outcomes by Gender	22
6.2 Heterogeneous Effects by Household Head Education	26

6.3	Replication of Cakir et al. (2021) results	30
CHAPTER 7: ROBUSTNESS CHECKS		34
7.1	NUTS-1 Region-Year Effects	34
7.2	New definition of the variable of interest	34
7.3	Controlling for macro level variables	35
7.4	Controlling for birth year and school quality	35
CHAPTER 8: CONCLUSION		37
REFERENCES		39
APPENDIX		42

LIST OF TABLES

1	Refugee to Native Ratio (%)	15
2	Summary Statistics	16
3	Employed Children Summary Statistics	17
4	The effect of Syrian refugees on native boys	24
5	The effect of Syrian refugees on native girls	25
6	The effect of Syrian refugees on native boys by household head's education level, 2SLS Estimates	27
7	The effect of Syrian refugees on native girls by household head's education level, 2SLS Estimates	29
8	Cakir et al. (2021) boys employment replication table	31
9	Cakir et al. (2021) girls employment replication table	32
10	Labor market outcomes using 2004-2015 sample period	33
11	The effect of Syrian Refugees on young native, NUTS-1 Region- Year interaction fixed effects	42
12	The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.02), 2SLS Estimates	43
13	The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.04), 2SLS Estimates	44

14	The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.1), 2SLS Estimates	45
15	The effect of Syrian Refugees on young native with macro-level variables (Unemployment rate and Logarithm of GDP), 2SLS Es- timates	46
16	Controlling for Birth Year, 2SLS Estimates	47
17	Controlling for school quality, 2SLS Estimates	48
18	Placebo Tests	49
19	Placebo Tests by Household Head Education Level (Boys)	50
20	Placebo Tests by Household Head Education Level (Girls)	51

LIST OF FIGURES

1	The distribution of Syrian Refugee among Turkish Provinces . . .	21
---	--	----



CHAPTER 1

INTRODUCTION

The Syrian civil war in 2011 saw one of the world's largest refugee crises in decades. Half of the entire Syrian population was forced to migrate out of their provinces, out of which 50 percent migrated internally, and 50 percent chose to seek refuge in the neighboring countries, Turkey, Lebanon, and Jordan. Currently, Turkey is the largest refugee host country, hosting nearly 3.7 million Syrian refugees by January 2022.¹ Syrian refugees initially were given "Temporary Protection" status, and later in 2016, they were allowed to apply for work permits. Even though very few refugees have received work permits, this has not stopped them from getting jobs in the informal sector. According to Turkish and Syrian Demographic and Health Surveys (TDHS) (2018), 89 percent of married male refugees and 8 percent of married female refugees are employed.² In addition, refugees, on average, are younger and less educated than natives (TDHS, 2018). Hence, we would expect a negative impact of refugees on the native informal sector. This paper aims to analyze the impact of Syrian refugees on young (15-17 years) natives' labor market outcomes.

A sizeable literature on refugees studies the impact on native labor market outcomes. Most studies (Card, 1990; Hunt, 1992; Friedberg, 2001; Dustmann, Glitz, and Frattini, 2008; Borjas, 2013) find little or no effect on native labor markets,

¹https://data2.unhcr.org/en/situations/syria#_ga=2.205760275.1205729204.1642419709-832500934.1642419709

²In 2018 Hacettepe University Institute of Population Studies Ankara, Turkey conducted the Demographic and Health Survey for both Turkish citizens and Syrian refugees.

while Glitz (2012), Aydemir and Kırdar (2017), and Dustman et al. (2017) find a negative impact of refugees on natives. Hence, studying the effect of Syrian refugees on Turkish natives' labor markets is of great interest, especially given the size of the influx and the data availability. Akgunduz et al. (2015) and Cengiz and Tekguc (2021) find no effect on the native labor markets, while del Carpio and Wagner (2015), Ceritoglu et al. (2017) and Aksu et al. (2018) find negative effects. The later studies explore the regional variation in the refugees to native ratio using a difference-in-difference IV methodology to investigate the impact of refugees on natives' labor market outcomes. Different from them, we focus on the effect of refugees on young natives rather than the whole working age sample. In addition, we study the impact of refugees on natives' child labor which we define according to the 2003 Labor Act (No. 4857).³ Child labor in Turkey has been decreasing throughout the years. Currently, there are 720,000 children engaged in economic activity, 80 percent of which are aged between 15-17, and 20 percent are aged between (5-14) years old (ILO, 2021).⁴

According to 2001 ILO's Worst Forms of Child Labor Convention, 1999 (No. 182), working in hazardous jobs is regarded as one of the four worst forms of child labor.⁵ Children working longer hours than authorized by the Governmental Laws are considered to work in a hazardous job. We define child labor as working more than 40 hours per week or 10 hours per week if the child is attending school. According to Turkish Household Labor Force Survey (THLFS) surveys, nearly 17 percent of natives aged between 15 to 17 years are employed, and the majority (70 percent) of employed children are male. In addition, 71 percent of employed females and 86 percent of employed males work in hazardous jobs. The share of young natives employed in the informal sector is higher than the percentage of

³<https://www.ilo.org/dyn/natlex/docs/ELECTRONIC/64083/77276/%20F75317864/TUR64083%20English.pdf>

⁴https://www.ilo.org/ankara/areas-of-work/child-labour/WCMS_774757/lang--en/index.htm

⁵https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::N0::P12100_ILO_CODE:C182

adult natives, 85% compared to 42%, respectively.

We believe the impact of refugees on young natives and child labor to be ambiguous for the following two reasons. Firstly, we would expect refugees to affect young natives negatively by substituting them in the informal sector, as refugees could work at lower wage rates. In addition, Tumen (2018) argues that refugees have a positive impact on native children's high school enrollment level. Consequently, refugees might reduce natives' child labor. Secondly, from the literature (Kofol and Nejad, 2017) we know that children's employment is negatively related to household income. Refugees may affect natives' employment levels negatively in the informal sector (del Carpio and Wagner, 2015; Ceritoglu et al., 2017; Aksu et al., 2018). Hence, we would expect more children engaged in economic activity due to the negative impact of refugees on adults' employment in the informal sector. Moreover, children might extend their working hours to compete with Syrian refugees, which might lead to an increase in native child labor.

To estimate the impact of refugees on young natives' labor outcomes, we use the data from 2004-2018 THLFS surveys and the variation in refugee to native ratio across NUTS-2 regions. The shock to Syrian refugees is random, therefore we can argue that the Syrians migrating to Turkey is not related to the social and economic development in Turkey at that specific year. However, the settlement of the refugees might not be exogenous. Initially, refugees settled across the provinces close to the border. Later, we observe that a significant share of refugees has moved to the Western region, which could be due to the social and economic opportunities that western provinces provide. Hence, this is a potential threat to our identification, and we employ an IV approach using a distance instrument similar to Aksu et al. (2018).

We find that Syrian refugees have a positive effect on young native male employ-

ment levels. The arrival of 10 Syrian refugees drives one boy into employment and does not affect female employment levels. We implement two definitions of child labor based on children’s usual working hours and the hours worked during the reference week. The results show that refugees do not affect native male and female child labor. In addition, we estimate the effect of refugees on children’s hours worked per week and labor force participation. Again, we implement two definitions for hours worked per week based on the usual hours worked per week and during the reference week. There is no effect on hours worked per week for both definitions, while there is a positive effect on male labor force participation only, which supports the findings on young male employment. Next, we control for the heterogeneity of refugee effects and find that boys who come from households with less-educated household heads are positively affected by refugees, and there is no effect on girls and boys who live in households where household heads are more educated. Regarding other outcomes, there is supporting evidence, which shows a positive effect of refugees on male labor force participation who live in households with less-educated household heads.

In a recent and concurrent work to ours, Cakir et al. (2021) study the impact of Syrian refugees on young natives’ employment level and educational attainment. We focus on the same young natives, 15-17 years old, and use the Aksu et al. (2021) methodology. We have a larger sample period, and the data on Syrian refugees differ from their paper as they use UNHCR data. While our data is similar to the Directorate General of Migration Management (DGMM) data.⁶ In addition, their outcomes of interest are school attendance and child workers, while ours are child labor and child worker. Cakir et al. (2021) analyze the impact of Syrian refugees on young natives’ labor market outcomes, using the same method and instrument. We replicate their estimation on young male and female employment levels for the 2004-2015 period (excluding 2012) and find negative

⁶UNHCR and DGMM provide different values on the number of registered Syrian refugees in Turkey for each year. <https://en.goc.gov.tr/temporary-protection27>

effects on all our outcomes. Due to differences in the main variables of interest, we do not find the exact magnitude for the employment coefficients. They find that the arrival of 10 refugees drives seven boys and five girls out of employment, while our results show that the arrival of 10 refugees pushes four boys and three girls out of employment.

The outline of the paper is as follows. In Chapter 2, we discuss the literary review. Chapter 3 provides background information regarding Syrian refugees and child employment in Turkey. Next, Chapter 4 describes the data, variables, and summary statistics. In Chapter 5, we present the methodology and the solutions for threats of identification. Chapter 6 presents the results on the effect of refugees on children's labor outcomes, their distribution among household heads' education level, and replication results of Cakir et al. (2021). Chapter 7 presents different robustness checks, and Chapter 8 concludes.

CHAPTER 2

RELATED LITERATURE

To examine the impact of refugees or migration on natives' labor market outcomes, a large share of the literature has relied on quasi-experiments, which study the non-voluntary movement of refugees caused by political events or civil wars (Card, 1990; Altonji and Card, 1991; Hunt, 1992; Carrington and de Lima, 1996; Friedberg, 2001; Mansour, 2010; Glitz, 2012; Aydemir and Kirdar, 2017; Dustman et al., 2017). The main problem that these analyses face is the endogeneity problem that refugees may choose to locate into a more developed and industrialized area.

Ruiz and Vargas-Silva (2015; 2016) study the impact of forced migration on Tanzania, where they find a negative effect of refugees on native employees. They use the inverse logarithm of distance from Tanzanian provinces to Rwanda and Burundi provinces to account for the endogeneity problem. Del Carpio and Wagner (2015) studies the impact of Syrian refugees on Turkish natives' labor market outcomes and find negative (positive) effects on natives' informal (formal) employment level. The decrease in female informal employment is more significant and larger than males. While the increase in males formal employment is larger and more significant than in females. To account for the endogeneity issue they use a distance-based instrument which depends on the total number of Syrian refugees in Turkey registered in a year, the fraction of the Syrian population that lived in each governorate in 2010, and distance between 26 Turkish NUTS-2 regions and 13 Syrian provinces. Ceritoglu et al. (2017) use a difference-in-

difference methodology to show that Syrian refugees decrease (increase) informal (formal) natives' employment level and that the effect is larger for females than males.

Aydemir and Kirdar (2017) use the ratio of earlier repatriates to non-repatriates in the labor force in 1980 as an instrument to deal with the endogeneity problem. They find an increased unemployment rate of native men and a negative effect of repatriates on female labor force participation and employment. Araci et al. (2021) use a synthetic control method, in which they control for the development level of the hosting areas. They find that impact of refugees on natives' labor market outcomes become significantly less adverse as regional development level rise. Aksu et al. (2018) use a difference in difference IV methodology which is the same approach that we will use. Their instrument is different from Carpio and Wagner (2015) as it gives less weight to provinces that are further away from the Turkish-Syrian border. They find no effect of refugees in men employment level and negative effect in female employment. There is a fall in males informal employment and an increase in males formal employment, which zeros the effect on males. Our paper differs from most of the above literature in the methodology and instrument applied. It differs from Aksu et al.'s (2018) paper in four ways. Firstly, we use an extended period of data, THLFS 2004-2018 data, while they use THLFS data from 2004-2015 excluding 2012. Secondly, we focus on young native workers, 15-17 years old, while they focus on 18-64 years old individuals. Thirdly, our data on Syrian Refugees are different.⁷ Lastly, we focus on the effect of refugees on different outcome variables such as natives' child labor and labor force participation.

Several papers focus on the impact of refugees on natives' youth labor market outcomes. Winter-Ebmer and Zweimuller (1999) study the immigration influx

⁷Aksu et al. (2018) use the data provided by UNHCR, while we our data is similar to DGMM.

in Austria and find no effect of refugees on young natives' labor markets. Glitz (2012) finds a negative impact on German youth employment while analyzing the immigration of Germans living in Eastern Europe and the Soviet Union after the fall of Berlin's Wall. Smith (2012) shows that the increase in the population of less-educated immigrants has had a considerably more negative effect on employment outcomes for native youth than for native adults. Ceritoglu et al. (2017), Aydemir and Kirdar (2017) find a negative impact of refugees on the youth labor market. Cakir et al. (2021) study the effect of Syrian refugees on young natives' employment level and educational attainment. We focus on the same young natives, 15-17 years old, and employ the methodology of Aksu et al. (2018). In addition, different from their paper, we focus on child labor, working hours, and labor force participation.

There is a large literature on child labor, however little do we know about the impact of refugees on child labor. Dayioglu and Kirdar (2020) focus on the effect of 1997 the Turkish Education Reform, which changed mandatory education from 5 years to 8 years. They find that the reform reduces child labor by 4.8 percentage points for 12-17-year-olds and 1.7 percentage points for 7-11-year-olds. Dayioglu et al. (2021) examine the child labor among Syrian refugees and find that 17 percent of 12-14 and 45 percent of 15-17 years old refugees are engaged in paid employment. Although most of the papers focus on child labor among the refugees, less work is done on the impact of refugees on natives' child labor. To the best of our knowledge, only Kofol and Nejad (2017) studies the impact of refugees on natives' child labor. They analyze the Rwanda and Burundi refugee influx in Tanzania, Kagera region. They construct a theoretical model which implies that households' income is a key indicator of child labor supply, and find negative impacts on native child labor. We contribute to this literature by providing evidence from Turkey.

CHAPTER 3

BACKGROUND INFORMATION

3.1 Syrian Refugees

The civil war in Syria started with the Arab Spring protest in 2011. A decade has passed since the conflict began, and around 13.4 million Syrians need protection assistance in Syria. From 13.4 million individuals, nearly 6.7 million persons sought protection in Syria's neighboring countries. As of 2021, Turkey is the largest refugee host country, with 3,7 million Syrian refugees, which makes up to 67 percent of total Syrian refugees. The rest of the Syrians who migrated sought refuge in Lebanon (844,056), Jordan (672,804), Iraq (250,419), Egypt (135,239), and some other countries (42,578). In 2011, only a small number of refugees (8000) arrived in Turkey. In the next few years, the number started growing by reaching 224,655 in 2013, 1.5 million in 2014, 2.5 million in 2015, 3.4 million in 2017, and 3.7 million by now. From the beginning, the majority of Syrian refugees in Turkey lived in urban areas, and a small share of them lived in camps. Currently, a small number of refugees (51,603) live in camps. According to DGMM, the most populated province (as a share of total refugees) are Istanbul (14%), Gaziantep (12%), Hatay (12%), Sanliurfa (12%), Adana (7%), Mersin (6.5%), Bursa (5%), Izmir (4%), Konya (3%), Kilis (3%), Other (21.5%).

The main reason that most of the Syrian refugees left Syria is due to security reasons, and they chose to settle in Turkey due to the ease of transportation (Aksu et al., 2018). Hence, the majority of the refugees are from Syrian provinces close

to the border like Aleppo, Idlib, Ar Raqqa, Latakia, Hassakeh, and Hims, and they chose to live in the provinces close to the Turkish-Syrian borders. They decided to live close to the border as they were supposed to be in Turkey for a temporary period, and they are closer to their relatives in Syria. Currently, a large number of refugees live in Western provinces. Ten years is not a short period as most of the refugees' assets have been utilized, and they live in poverty which explains the movement towards more industrialized provinces which provide more employment opportunities. In addition, moving closer to the West of Turkey means closer opportunities to migrate to European countries. Syrian refugees obtained temporary protection status in October 2011 (Araci et al. 2021). It made it possible for them to use the health and education services that the Turkish Government provided them. In 2014-2015 Turkish government allowed Syrian students to enroll in Turkish public education, while temporary education centers were operating inside and out of the camps.

Syrian refugee households differ from Turkish Households in many demographic aspects such as household members, education level, age, school attendance, employment. On average, Syrian households in Turkey have six members, and 10% of households are female-headed, whereas Turkish households have 3.5 members and 16% of the households are female-headed (TDHS, 2018). In addition, refugees are, on average, younger than natives as the age average for refugees is 22.6 years compared to 32.4 years for natives (Refugee Association, RASAS).⁸ On average, Syrian refugees are less-educated than natives, female and male natives have 4.8 and 7.1 years of education completed, compared to refugee females and males who have 4.5 and 5.5 years, respectively (TDHS, 2018). The school attendance is higher among natives than refugees, 94.2% of natives aged 6-13 attend primary or secondary school, while only 75.8% of refugees attend (TDHS, 2018). The net attendance ratio drops in high school as 77.3% of natives aged 14-17 attend high

⁸<https://multeciler.org.tr/eng/>

school, compared to 13.9% of refugees (TDHS, 2018). The employment rate of currently married Turkish females aged 15-49 is 32%, and 94% for their husbands, compared to 8% of currently married refugee females and 89% of their husbands. In 2016, the Turkish Government decided to issue work permits to refugees under temporary protection. Currently, 116,000 work permits have been issued (Refugee Association), which is nearly 5% of the Syrian refugee working-age population. Hence, most of the refugees are working in the informal sector.

3.2 Child Worker in Turkey

In this section, we discuss the key policies and decisions taken by the Turkish Government regarding child employment and provide an overview of the situation throughout time. Initially, the minimum working age has been 12 years and 15 years in some specific sectors (industry) (Dayioglu and Kirdir 2020). However, children under the minimum working age have been working. 4.4% of all and 8.3% of rural 7 to 11 years old children were employed in 1994, and 3.9% of 12 to 14 years old boys living in urban areas in 1994 worked in Industry (Dayioglu and Kirdir 2020). In 1998 Turkey ratified the Minimum Age Convention, 1973 (No. 138), and in 2001 ILO's Worst Forms of Child Labor Convention, 1999 (No. 182). In 2003 the Labor Act (No. 4857) of Turkey stopped the employment of children who have not completed the age of 15 unless it is a 'light work' and the child has completed the age of 14 and the primary education. According to the labor act, children who have completed their basic education and are no longer attending school may work up to 7 hours per day, 35 hours per week which can be increased to 40 hours per week. While children who attend school may work up to 2 hours per day, 10 hours per week, and when the schools are closed, they may work the same number of hours as the children who are not attending school.

According to the results of THLFS 2020, the labor force participation rate at the age group of 15-17 was 16.2% (600 thousand). The labor force participation rate

for boys is 23.4%, and 8.6% for girls. There are 720 thousand children engaged in economic activity in Turkey, where the majority of them (70%) are males. Nearly 80% of them are children aged between 15-17, 16% between 12-14, and 4% are between 5-11 years old. The main sectors of employment are agriculture (31%), manufacturing (24%), and services (45%). However, the employment sector varies across age intervals, where 61% of children aged 5-14 work in the agriculture sector and 51% of children aged 15-17 in the service sector. 66% of the children engaged in economic activity attend school, where the attendance is higher for females (66%) than males (57%). The main reasons for working are: assist household economic activity (36%), learn how to trade and acquire occupation (35%), contribute to household income (23%), and meet their own needs (6%). According to ILO, the number of children engaged in economic activity in Turkey has been decreasing through the years. Around 2.3 million children engaged in economic activity in 1994, which is about 15% of the children. The number drops to nearly 1 million (6%) and 720,000 children (4.4%) in 2006 and 2019, respectively. There has been a sharp decrease from 1994 until 2006 in the number of children engaged in economic activity.

From 2006 to 2012, we observe a decrease in child workers, with the share of child workers remaining 6%. In 1997 compulsory schooling was changed from 5 to 8 years, meaning that apart from primary education, even secondary education became mandatory. Dayoglu and Kirdir (2020) argue that the 1997 compulsory schooling reform has a positive and significant effect on reducing child labor. In 2012, The Grand National Assembly of Turkey passed Law No. 6287, which extended the years of compulsory schooling from 8 years to 12 years, and the structure became 4+4+4: primary school, secondary school, high school. According to 2011 THLFS, the school attendance rate was 71% before the reform and the influx of Syrian refugees. While in 2013, the school attendance was nearly 78%. Hence, the reform might have a significant effect. However, it is

worth noting that in 2004, 2012, and 2018 the attendance was 58%, 74%, and 82%, respectively. Hence, it could be that this increase is more of a trend than an effect of the reform. Since the refugees arrived the year before the reform, they might be affected by the reform. Dayioglu et al. (2021) argue that refugee children arriving at an older age are more likely to join child labor, while younger children are less likely as they can adapt faster.



CHAPTER 4

DATA AND SUMMARY STATISTICS

We use the data from 2004-2018 Turkish Household Labor Force Surveys (THLFS) conducted by the Turkish Statistical Institute (TURKSTAT). The type of data is repeated cross-sectional surveys. They are represented at the country level and across the NUTS-1 and NUTS-2 regions. We use the data from 2004-2018 to keep track of the trends and the events that have occurred, which may affect child labor through time. We focus on 15-17 years old individuals as the THLFS does not provide any information about 6-14 years old employment levels. The THLFS is released annually and contains a large number of observations at regional levels (NUTS-1 and NUTS-2 levels). Each survey provides information regarding the demographic characteristics and the labor market outcomes of each individual. The main variables that we are going to use are: age, gender, birth year, highest level of education completed, school attendance, employment, labor force participation, unemployment, and weekly hours worked. In addition, we use household control variables such as household size, household head gender, age, education. Finally, we control for school quality by including variables on the number of students per division, teacher, and classroom for primary and secondary school education, respectively.

Our variable of interest is the refugee to the native ratio, which we construct by using the data on Syrian refugees and the population of each Turkish province from 2012 until 2018. The data on the Syrian refugees is similar to the numbers provided by the DGMM. We aggregate the numbers of Syrian refugees to NUTS-1

and NUTS-2 regions as the data provides the number for the 81 provinces only. Therefore, we can calculate the ratio of refugees to natives at all region levels. Table 1 above shows the refugee ratio across all the NUTS-2 regions from 2012 to 2018. Adana, Diyarbakir, Gaziantep, Hatay, and Siirt are the regions that have the highest number of refugees per native individual. Finally, we use a distance instrument which is also used by Aksu et al. (2018).

Table 1: Refugee to Native Ratio (%)

NUTS-2	Codes\Year	2012	2013	2014	2015	2016	2017	2018
1- Istanbul	1	0,00	0,00	1,30	2,39	2,95	3,56	3,63
2- Edirne	2	0,00	0,00	0,47	0,76	0,86	1,02	0,95
3- Balıkesir	3	0,00	0,00	0,09	0,26	0,32	0,49	0,55
4- Izmir	4	0,00	0,01	1,66	1,98	2,39	3,09	3,35
5- Denizli	5	0,00	0,00	0,28	0,63	0,80	1,16	1,17
6- Manisa	6	0,00	0,00	0,11	0,28	0,39	0,59	0,74
7- Bursa	7	0,00	0,01	2,25	2,17	2,72	3,53	4,26
8- Kocaeli	8	0,00	0,01	0,33	0,65	1,08	1,78	2,08
9- Ankara	9	0,00	0,01	0,56	0,96	1,26	1,73	1,61
10- Konya	10	0,00	0,01	0,75	2,04	3,02	4,28	4,48
11- Antalya	11	0,00	0,00	0,05	0,29	0,48	0,52	0,57
12- Adana	12	0,00	0,31	4,60	6,63	7,37	9,19	11,01
13- Hatay	13	0,02	1,71	10,02	15,24	16,26	19,31	18,38
14- Nevşehir	14	0,00	0,01	0,22	0,49	0,77	1,15	1,31
15- Kayseri	15	0,00	0,01	0,93	1,78	2,56	3,31	3,61
16- Zonguldak	16	0,00	0,00	0,02	0,04	0,07	0,11	0,15
17- Kastamonu	17	0,00	0,00	0,05	0,09	0,15	0,25	0,26
18- Samsun	18	0,00	0,00	0,08	0,15	0,24	0,35	0,37
19- Trabzon	19	0,00	0,00	0,04	0,08	0,14	0,18	0,19
20- Erzurum	20	0,00	0,00	0,03	0,05	0,07	0,11	0,11
21- Kars	21	0,00	0,00	0,04	0,09	0,10	0,13	0,12
22- Malatya	22	0,00	0,41	0,47	1,25	1,57	2,12	2,50
23- Van	23	0,00	0,00	0,07	0,16	0,19	0,47	0,45
24- Gaziantep	24	0,53	3,70	9,46	17,84	17,29	18,67	20,41
25- Diyarbakir	25	0,00	1,55	7,35	11,27	11,96	13,34	12,85
26- Siirt	26	0,00	0,14	3,24	5,84	5,92	5,83	5,80
Total		0,02	0,29	1,96	3,20	3,59	4,30	4,50

Note: Data source is from TURKSTAT and DGMM

Panel A, in Table 2, shows the summary statistics regarding young natives for each gender group. There is a balanced distribution between male and female individuals in each age group. Most of the individuals, 81.7% of females and

Table 2: Summary Statistics

Panel A: Child Statistics			Panel B: Household Head Statistics		
	Female	Male		Female	Male
Age Groups			Age Groups		
15 years old	33.3%	33.3%	15-24	1.6%	0.6%
16 years old	33.4%	33.3%	25-34	5.2%	1.8%
17 years old	33.3%	33.4%	35-44	43.5%	41.2%
			45-54	28.6%	42.0%
Education Level			55-64	21.0%	14.3%
Less than Primary	12.2%	7.6%	Education Level		
Primary	2.0%	1.6%	Less than Primary	42.3%	11.2%
Secondary	81.7%	87.0%	Primary	40.2%	54.6%
High school and above	4.2%	3.9%	Secondary	5.4%	11.8%
School Attendance			High school	4.8%	7.5%
Not Attending	32.5%	26.5%	University Degree	3.1%	6.5%
Attending	67.5%	73.5%	Master Degree and above	4.2%	8.3%
Working Status			Working Status		
Working	10.2%	22.7%	Working	28.5%	77.0%
Unemployed	1.4%	4.2%	Unemployed	3.9%	6.3%
Not in Labor Force	88.4%	73.1%	Not in Labor Force	67.6%	16.8%
HH Relationship			Marital Status		
Household Head	0.1%	0.1%	Single	2.1%	0.5%
Partner	1.9%	0.0%	Married	37.7%	98.0%
Child	91.6%	93.4%	Divorced	18.1%	0.4%
Grandchild	4.5%	4.6%	Widowed	42.0%	1.1%
Other	2.0%	1.9%			
N	207,460	210,501		43,068	374,893

Note: Data sources are from the Turkish Household Labor Force Survey 2004-2018.

87% of males, have completed secondary school, while 12.2% of females and 7.6% of males have not completed any level of education. Males attend school more than females, 73.5% compared to 67.5%. Even though females attend school less, 22.7% of males are employed compared to 10.2% of females. The large share of females being out of the labor force and out of school implies that more females do not attend school and work compared to males. Panel B, in Table 2, shows the summary statistics for the household heads for each gender group. The majority of household heads are male, and only 10% are females. The household head is female, mostly when they are divorced or widowed. Only 28.5% of female household heads are working compared to 77% of male household heads. The majority of female (82.5%) and male household heads (65.8%) education is less than sec-

Table 3: Employed Children Summary Statistics

Child Worker Statistics		
	Female	Male
Job Formality		
Formal	16.2%	14.1%
Informal	83.8%	85.9%
Job Type		
Full-time	66.2%	81.1%
Part-time	33.8%	18.9%
Hazardous Job		
No	28.9%	13.9%
Yes	71.1%	86.1%
Workplace		
Field/Garden	56.7%	29.1%
Regular place	41.4%	63.5%
Other	2.0%	7.4%
Employment Type		
Paid	51.5%	66.3%
Unpaid	48.5%	33.7%
N	21,219	48,000

Note: Data sources are from the Turkish Household Labor Force Survey 2004-2018.

ondary school. Table 3 shows child worker summary statistics for each gender group. According to the data, 70% of child workers are males, which exhibits a pattern similar to the household head employment rates. Most child workers are working in the informal sector and full-time jobs. A hazardous job, which is one of the worst forms of child labor, is more common in this age group, and we observe that 71.1% of female and 86.1% of male child workers are working in hazardous jobs. Majority of boys are employed in paid employment, while girls are equally divided among paid and unpaid employment. Finally, the majority of females are working in the field or garden, while the majority of males are working in a regular workplace.

CHAPTER 5

METHODOLOGY

The method that we employ in our analysis is the difference-in-difference IV methodology. We estimate the following baseline equation, which is similar to Aksu et al. (2018):

$$y_{ijt} = \alpha + \beta R_{jt} + \zeta X_{ijt} + \lambda HH_{ijt} + \gamma Z_{jt} + \delta_j + \delta_t + \theta_{jt} + S_{jt} + u_{it} \quad (5.1)$$

where y_{ijt} denotes the child worker, child labor, working hours, and out of labor force outcomes for individual i in the region j at time t . Since we are studying 15-17 years old individuals, we define the child worker as a variable taking value one if the child is engaged in economic activity paid or unpaid and zero otherwise. Child labor is a dummy variable taking value one if a child works more than 40 hours per week or 10 hours per week while attending school, and zero otherwise. We have the average child working hours for a usual week and the reference week, and we use both. Working hours are reported only for children engaged in economic activity, therefore we assign zero to the working hours of unemployed children and out of labor. Out of labor force is a dummy variable taking value one if the children are out of labor force and zero if they are employed or unemployed.

R_{jt} is the refugee to the native ratio in region j at time t . β is our key parameter of interest, which shows the effect of increasing the refugee to native ratio from 0 to 1 on the labor market outcomes of children. We control for individual,

household, and macro-level effects. Our individual-level control variables (X_{ijt}) includes age, gender, school attendance, highest level of education completed: (i) illiterate or literate with no diploma, (ii) primary school graduates, (iii) secondary school graduates, (iv) high school graduates and more. Household-level control variables (HH_{ijt}) consist of household head control variables such as household head age, gender, education, and household size. Z_{jt} stands for macro-level control variables at the NUTS-1 region-year level. The variables we include are unemployment level and the logarithm of GDP in the Turkish Lira. S_{jt} stands for school quality control variables at the NUTS-2 region-year level. The variables we are going to use are the number of students per division, teacher, and classroom at primary and secondary school education, respectively. Since our sample includes a large sample period, many events have occurred as the Great Recession, Turkish education reform in 2012, and minimum wage increases. Hence, we control for the region and time-fixed effects.

In equation (5.1), δ_j corresponds to the region (NUTS-2 Region) fixed effect, δ_t year fixed effects, and u_{it} to the error term. Aksu et al. (2018) show that the common-trend assumptions fail for certain outcome variables. In the appendix, Table 18, presents the results on placebo tests. We move the refugee to native ratio of years 2013, 2014, and 2015 to the pre-treatment years 2009, 2010, and 2011, respectively. If the common-trend assumptions are to hold we should not find any significant impact in the baseline model. However the results show that the key identification assumption fail for all outcomes when we do not control for time trends. While, the key identification assumption holds for majority of the outcomes when we include region-year time trends.⁹ Hence, we including three region-year time trends (θ_{jt}) similar to them: (i) time trends for five regions (East, West, North, South, and Central), (ii) time trends for 12 NUTS-1 regions, and (iii) the interactions of 5-region and year-fixed effects. We define

⁹The key identification assumption fails for boys out of labor force outcome and girls child labor definition 1.

the five regions according to Aksu et al. (2018) where each region consists of the following NUTS-1 regions: West (1-4), Central (5 and 7), South (6), North (8 and 9), and East (10-12).

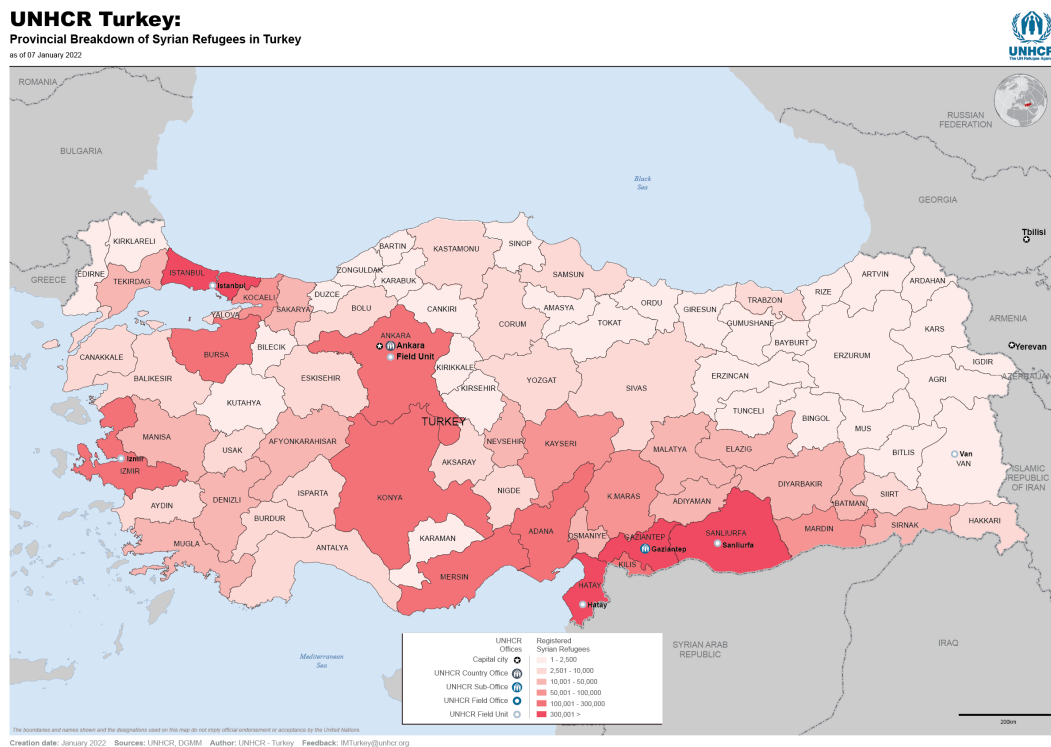
According to del Carpio and Wagner (2015) and Aksu et al. (2018), our variable of interest refugee to native ratio might be prone to endogeneity issues if the variation is correlated with the Turkish economic conditions across regions or time. The beginning of the Syrian influx is related to the civil war in Syria rather than Turkish economic conditions. The majority of refugees argue that they migrated to Turkey due to security reasons and ease of transportation. However, when it comes to their residence in Turkey, initially, they resided close to the border. The majority of the refugees moved to urban areas, and only a few lived in camps. They had access to healthcare and education services in the provinces where they lived. Figure 1 shows that the majority of the refugees continue living in the regions close to the border. In addition, we observe that a large share of refugees lives in the Western provinces. Western provinces are more industrialized and economically developed than the South-East provinces. The first waves of influx might have been exogenous, as refugees thought they would be in Turkey temporarily. However, nearly a decade has passed, and roughly 3.7 million refugees still live in Turkey, and the spread of refugees is different from what it was in the beginning. Hence, we might have a network effect that makes our variable endogenous as the newcomers migrate to regions where their relatives and jobs opportunities are waiting for them since a large share of Syrian male refugees works in the informal sector. To deal with the endogeneity problem, we use the Aksu et al. (2018) distance instrument, which is an extension of del Carpio and Wagner’s (2015) instrument. The instrument is defined as follows:

$$I_{jt} = \sum_{s=1}^{13} (\pi_s * M_t) / d_{js} \quad (5.2)$$

where π_s is the fraction of Syrians in Turkey in 2015 who originated from province

s in Syria, M_t is the number of Syrians in Turkey in year t , and d_{js} is the distance between the major cities of NUTS-2 region j in Turkey and province s in Syria. According to Aksu et al. (2018), the instrument first calculates the number of migrants from each of the 13 provinces of Syria for each year, and for each Turkish region at time t , it weights this number inversely with the distance variable and sums these weighted values over the 13 provinces in Syria. In other words, the instrument is a proxy for the expected total number of Syrian refugees across their provinces for each Turkish NUTS-2 region at time t . Aksu et al. (2018) and del Carpio and Wagner (2015) provide the first stage results of 2SLS estimates and show that the instrument is not weak.

Figure 1: The distribution of Syrian Refugee among Turkish Provinces



Note: Image is taken from UNHCR, January 2022.

CHAPTER 6

RESULTS

In this section, we discuss the results of our estimations. We first present the results of the effect of refugees on native boys' and girls' labor market outcomes separately. Next, we estimate the same model by gender, and we also check the robustness of our results by including household heads' education levels. We use secondary school educational level as the threshold level. Finally, we replicate the analysis of Cakir et al. (2021) on natives' employment. We use three variants: (i) the individual and household head level specific variables used in Cakir et al. (2021), (ii) our individual and household head-level control variables, and (iii) include the 2012 data in our analysis. In each table, we report the first-stage regression and find that our instrument is very strong.

6.1 Labor Market Outcomes by Gender

Table 4 presents an analysis of the impact of refugees on native boys' labor market outcomes. Panel A and B in Table 4 show the estimation results of OLS and 2SLS estimates, respectively. We do the same for native females in Table 5, similar to Table 4. Each panel has four columns where each column has different specification controls. In both panels, we include the NUTS-2 region and year-fixed effects, while in columns (2) and (3), we control for five-region and NUTS-1 region time trends. In addition, we include the interaction of 5-region and year fixed effects similar to Aksu et al. (2018). We focus on the analysis of

2SLS estimation, specifically on the (2) and (3) columns. Similar to Aksu et al. (2018), our preferred estimation is the one that uses NUTS-1 region time trends as it is more flexible.

According to Table 4, we find a positive and significant effect of refugees on native boys' employment level in all 2SLS estimations. The estimates in columns (2) and (3) show that the arrival of 10 Syrian refugees makes it possible for one native boy to get employed. The results we find are different from the literature that suggests a negative impact of refugees on the employment level of young natives. However, different from the literature, we have a larger sample size, and we show it by replicating the results of Cakir et al. (2021) in section 6.3. Table 4, reports the estimations on child labor. We implement two definitions of child labor and working hours. In the first definition, we use the hours worked per week that an individual usually works, while in the second one, we use hours worked per week during the reference week. The result of estimates (2) and (3) show that there is no impact of refugees on male child labor.

Next, we focus on the effect of refugees on native boys working hours and labor force participation. The estimates (1) and (4), in Table 4, show a positive and significant effect of refugees on boys working hours for both definitions. However, our preferred estimations (2) and (3) are positive but insignificant. Since the share of unemployed girls and boys is small, we expect to find supporting results while estimating the effect of refugees on boys' and girls' labor force participation. Hence, the results of the estimates show that refugees have a positive impact on native boys' labor force participation, which supports our findings in male employment. The arrival of 10 Syrian refugees drives on average 1 native boy in the labor force. Thus, it is consistent with our results on the impact of refugees on boys' employment levels.

Table 4: The effect of Syrian refugees on native boys

	A. OLS				B. 2SLS			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.087** (0.035)	0.050 (0.039)	0.046 (0.048)	0.117*** (0.041)	0.145*** (0.038)	0.082* (0.042)	0.116** (0.053)	0.164*** (0.044)
Child Labor defn. 1	0.004 (0.034)	-0.045 (0.039)	0.005 (0.048)	0.002 (0.041)	0.077** (0.037)	-0.008 (0.042)	0.063 (0.052)	0.050 (0.044)
Child Labor defn. 2	0.028 (0.034)	-0.023 (0.038)	0.025 (0.048)	0.025 (0.041)	0.103*** (0.037)	0.015 (0.041)	0.077 (0.052)	0.076* (0.043)
Hours/Week defn. 1	6.153*** (1.855)	2.542 (2.090)	0.275 (2.591)	4.451** (2.214)	9.280*** (2.011)	3.272 (2.261)	3.155 (2.816)	5.784** (2.363)
Hours/Week defn. 2	6.242*** (1.826)	2.306 (2.058)	0.168 (2.551)	4.205* (2.180)	9.513*** (1.980)	2.990 (2.226)	2.647 (2.773)	5.826** (2.326)
Out of Labor Force	-0.163*** (0.034)	-0.137*** (0.039)	-0.053 (0.048)	-0.239*** (0.041)	-0.207*** (0.037)	-0.152*** (0.042)	-0.120** (0.052)	-0.276*** (0.044)
First-Stage					0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared					0.930	0.947	0.963	0.960
F-Statistic					52928	65351	86256	46266
N	210,503	210,503	210,503	210,503	210,503	210,503	210,503	210,503
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the male individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the OLS regression analysis, and Panel B, columns 1-4, reports 2SLS regression analysis for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 5 shows the results for native girls. Different from the results we find for native boys' employment, there is no effect of refugees on native girls' employment in estimation (2) and (3). The magnitude of the coefficients is small, and the sign is negative. Next, we find no impact of refugees on female child labor for both definitions. The results in estimation (1) are significantly similar to employment

Table 5: The effect of Syrian refugees on native girls

	A. OLS				B. 2SLS			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.216*** (0.028)	0.035 (0.032)	0.003 (0.039)	0.080** (0.034)	0.262*** (0.031)	-0.007 (0.034)	-0.047 (0.043)	0.051 (0.036)
Child Labor defn. 1	0.112*** (0.025)	0.000 (0.028)	-0.062* (0.035)	0.054* (0.029)	0.165*** (0.027)	-0.009 (0.030)	-0.062 (0.038)	0.048 (0.031)
Child Labor defn. 2	0.103*** (0.024)	0.007 (0.027)	-0.054 (0.034)	0.056* (0.029)	0.151*** (0.026)	0.000 (0.029)	-0.056 (0.037)	0.055* (0.031)
Hours/Week defn. 1	10.942*** (1.308)	2.106 (1.469)	-3.288* (1.824)	4.091*** (1.557)	14.285*** (1.420)	0.938 (1.591)	-4.228** (1.984)	3.143* (1.662)
Hours/Week defn. 2	10.122*** (1.270)	1.771 (1.427)	-3.142* (1.771)	3.530** (1.512)	13.420*** (1.379)	0.694 (1.545)	-4.164** (1.927)	2.804* (1.615)
Out of Labor Force	-0.223*** (0.030)	-0.051 (0.033)	-0.008 (0.041)	-0.104*** (0.035)	-0.276*** (0.032)	-0.014 (0.036)	0.033 (0.045)	-0.082** (0.038)
First-Stage					0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared					0.927	0.944	0.962	0.959
F-Statistic					50031	61894	82236	43998
N	207,461	207,461	207,461	207,461	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the female individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the OLS regression analysis, and Panel B, columns 1-4, reports 2SLS regression analysis for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

level, while the coefficients of estimates (2) and (3) are very small, negative, and insignificant. Opposite to the boys, we find a negative and significant effect of refugees on female working hours in our preferred estimation. However, there is no effect on the second estimate, and similar to Aksu et al. (2018), we claim to have a significant impact if the coefficients of estimates (2) and (3) are statisti-

cally significant. Since there is no effect on girls' employment level, we find no effect on female labor force participation. Finally, on average, the results show a significant impact of refugees on the (1) and (4) estimates for all native boys and girls labor market outcomes.

6.2 Heterogeneous Effects by Household Head Education

In the previous section, we analyzed the results on the effect of refugees on native children's labor market outcomes. In this section, we conduct the same estimations to observe the distribution of the refugee effect, on young natives, based on the household head's education level. We create two representative samples, by dividing the household head education into two groups. The first sample consists of household heads whose education level is less than secondary school and the second sample consists of household heads whose education level is higher or equal to secondary school. In Table 6, Panel A and Panel B present the analysis of 2SLS estimates on native boys if the household head's education level is less than secondary school and higher or equal to secondary school, respectively. Table 7 represents the results on native girls similar to Table 6. We focus only on the 2SLS estimates, and as before the (2) and (3), estimations are our preferred estimates.

In Table 6, the estimates present a positive and significant effect of refugees on native boys' employment level when the household education level is less than secondary school. While there is no effect on native boys' whose household head education is greater or equal to secondary school. If we were to find a negative impact on the total sample of native boys, from the literature, we know that the natives whose household heads are more educated are more likely to drive out of employment. Since we found positive effects, the opposite should happen, which is in line with our findings. Native boys whose household heads are less educated

Table 6: The effect of Syrian refugees on native boys by household head's education level, 2SLS Estimates

	A. HH Education < Secondary School				B. HH Education $\geq$ Secondary School			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.185*** (0.048)	0.106** (0.054)	0.139** (0.068)	0.159*** (0.057)	-0.023 (0.058)	-0.083 (0.065)	-0.051 (0.078)	0.051 (0.067)
Child Labor defn. 1	0.105** (0.048)	-0.015 (0.054)	0.061 (0.068)	0.007 (0.056)	-0.018 (0.056)	-0.043 (0.063)	0.003 (0.076)	0.083 (0.065)
Child Labor defn. 2	0.140*** (0.047)	0.011 (0.054)	0.074 (0.067)	0.038 (0.056)	-0.021 (0.056)	-0.037 (0.062)	0.021 (0.075)	0.089 (0.065)
Hours/Week defn. 1	12.067*** (2.613)	4.216 (2.948)	3.850 (3.712)	4.978 (3.097)	1.648 (2.920)	-1.118 (3.247)	-0.811 (3.926)	4.793 (3.368)
Hours/Week defn. 2	12.234*** (2.576)	3.576 (2.906)	2.866 (3.659)	4.751 (3.053)	1.698 (2.863)	-0.659 (3.185)	-0.013 (3.850)	5.132 (3.303)
Out of Labor Force	-0.261*** (0.047)	-0.179*** (0.053)	-0.132** (0.067)	-0.281*** (0.056)	-0.015 (0.060)	0.015 (0.067)	0.026 (0.081)	-0.152** (0.069)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.936	0.950	0.965	0.963	0.920	0.941	0.960	0.955
F-Statistic	43179	51928	66921	35444	16436	21086	28027	14084
N	141,826	141,826	141,826	141,826	68,677	68,677	68,677	68,677
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the male individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis if household head education is less than secondary school and Panel B, columns 1-4, reports 2SLS regression analysis if household head education is more or equal to secondary school, for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household head level controls used are, age, gender, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

are more likely to be employed. Hence, we can argue that the variation in the total sample of native boys comes from the native boys whose household heads are less educated. Similar to the full sample, we find that the arrival of 10 Syrian refugees drives one native boy in employment. The estimates (2) and (3) in both

panels show that, no matter what the household head education level is, there is no effect on native boys' child labor. Once again, refugees do not affect native boys working hours. However, the coefficient is positive and larger for the (2) and (3) estimates when the household head has fewer years of education, while the coefficient is smaller and negative when the household head is more educated. Finally, we find a positive effect on native boys' labor force participation when the household head has fewer years of education and a negative effect when the household head has more years.

In Table 7, panels A and B, the estimates (2) and (3) show a negative and a positive effect on native females whose household head education level is less than secondary and higher or equal, respectively. In panel A, only the estimate (3) is significant at a 10% significance level, hence we do not claim to have any effect. Opposite to native boys, we observe a negative impact on native girls' child labor when the household head education level is less than secondary school and a positive effect when the household head education level is higher.¹⁰ The estimate (3), in panel A, is significant at a 1% significance level, while estimate (2), in panel B, is significant at a 5% significance level. Hence, the estimates offset each other, which explains the effect in the total sample. The impact of refugees on girls working hours is negative when the household head is less educated and is positive when he is more. This result is different from the distribution of boys' working hours, where we found an opposite sign for the two samples. Only the estimate (3) in panel A is negative and significant at a 1% significance level, and the value of the coefficient is larger. While in panel B, estimate (2) is positive and significant at a 5% significance level. However, it might be that the significant effect in the (2) column, panel B, is driven by the sample size, which is smaller

¹⁰In the appendix, Table 19 and 20 provide the placebo tests for boys and girls by household head education level, respectively. The results show that our key identification holds for boys for both samples for the majority of the outcomes. While, it fails to hold for most of the outcomes in girls sample, mostly in the sample with household head education level equal or greater than secondary school. Hence the results we find in Table 7 could be biased.

compared to the sample in Panel A and the total sample. Lastly, we observe no effect on girls' labor force participation in both panels, which coincides with our findings on girls' employment outcomes.

Table 7: The effect of Syrian refugees on native girls by household head's education level, 2SLS Estimates

	A. HH Education < Secondary School				B. HH Education $\geq$ Secondary School			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.274*** (0.040)	-0.058 (0.045)	-0.110* (0.056)	0.006 (0.047)	0.159*** (0.042)	0.075 (0.048)	0.068 (0.057)	0.120** (0.050)
Child Labor defn. 1	0.164*** (0.035)	-0.052 (0.039)	-0.140*** (0.049)	0.018 (0.041)	0.138*** (0.039)	0.088** (0.044)	0.085 (0.053)	0.128*** (0.046)
Child Labor defn. 2	0.146*** (0.034)	-0.043 (0.038)	-0.132*** (0.048)	0.027 (0.040)	0.131*** (0.039)	0.092** (0.043)	0.084 (0.052)	0.125*** (0.045)
Hours/Week defn. 1	15.385*** (1.871)	-0.766 (2.094)	-7.845*** (2.649)	2.042 (2.193)	9.637*** (1.840)	4.856** (2.058)	3.335 (2.464)	6.351*** (2.145)
Hours/Week defn. 2	14.390*** (1.817)	-1.055 (2.034)	-7.576*** (2.573)	1.660 (2.130)	9.074*** (1.788)	4.707** (2.000)	3.017 (2.395)	6.082*** (2.085)
Out of Labor Force	-0.290*** (0.042)	0.030 (0.047)	0.089 (0.059)	-0.048 (0.049)	-0.162*** (0.046)	-0.073 (0.051)	-0.058 (0.061)	-0.128** (0.053)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.935	0.949	0.965	0.962	0.913	0.936	0.957	0.952
F-Statistic	41820	50485	65490	34302	14675	18762	25163	12719
N	140,443	140,443	140,443	140,443	67,018	67,018	67,018	67,018
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the female individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis if household head education is less than secondary school and Panel B, columns 1-4, reports 2SLS regression analysis if household head education is more or equal to secondary school, for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household head level controls used are, age, gender, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

6.3 Replication of Cakir et al. (2021) results

In this section, we replicate Cakir et al. (2021) estimations on native children's labor market outcomes using our data on the distribution of Syrian refugees. The data Cakir et al. (2021) uses starts from 2004 until 2015, excluding 2012, as the data they use does not provide the distribution of the Syrian refugees among Turkish provinces in 2012. In Table 8, Panel A and B, present the results of OLS and 2SLS estimates on native boys' employment, respectively. Table 9 presents the same analysis for native girls. We conduct three different estimations: (i) the effect of refugees on native children employment using the 2004-2015 (excluding 2012) sample period and similar variables that Cakir et al. (2021) use, (ii) estimate (i) using our individual and household head-level control variables, (iii) estimate (ii) where we include 2012 in our sample period. We follow 2SLS estimation and our preferred estimates are (2) and (3).

Cakir et al. (2021) find that the arrival of 10 Syrian refugees drives about seven native boys and five native females out of employment. In Table 8, estimates (2) and (3) in Panel B show that refugees have a negative and significant effect on boys' employment levels. The arrival of 10 refugees drives about four native boys out of employment, which is half of what Cakir et al. (2021) find. The only difference between our variables is the refugee to native ratio. We use data on the distribution of Syrian refugees, which is consistent with the numbers provided by DGMM. In the (ii) and (iii) estimations, estimates (2) and (3) show that refugees have adverse effects on native boys, and the value of the coefficient drops slightly. In Table 9, Panel B, estimates (2) and (3) show a negative effect on native girls' employment for all three estimations. The arrival of 10 Syrian refugees drives 2-3 females out of employment.

Table 10 presents the estimation results of native children's other labor market outcomes such as child labor, working hours, and labor force participation. Esti-

Table 8: Cakir et al. (2021) boys employment replication table

	A. OLS				B. 2SLS			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker (i)	-0.073 (0.064)	-0.338*** (0.070)	-0.275*** (0.082)	-0.323*** (0.076)	-0.058 (0.069)	-0.392*** (0.075)	-0.346*** (0.089)	-0.348*** (0.081)
Child Worker (ii)	-0.120** (0.056)	-0.263*** (0.062)	-0.246*** (0.073)	-0.230*** (0.067)	-0.086 (0.061)	-0.302*** (0.066)	-0.269*** (0.078)	-0.248*** (0.071)
Child Worker (iii)	-0.128** (0.056)	-0.254*** (0.060)	-0.233*** (0.069)	-0.231*** (0.066)	-0.098 (0.060)	-0.284*** (0.065)	-0.254*** (0.074)	-0.258*** (0.070)
First-Stage					0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared					0.920	0.934	0.953	0.954
F-Statistic					36470	41800	52068	36445
N	155,500	155,500	155,500	155,500	155,500	155,500	155,500	155,500
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the male individuals aged 15-17 in the 2004-2015 Turkish Household Labor Force Survey (excluding the year 2012 for the first two estimations 1, 2). Panel A, columns 1-4, reports the OLS regression analysis, and Panel B, columns 1-4, reports 2SLS regression analysis. Each cell shows the coefficient for each dependent variable under each column specification. For Child Worker (i) we use similar individual and household head level control variables to Cakir et al. (2021). The individuals level control variables used in the first-row estimation are age groups and relationship to household head dummies. The household heads' level control variables used for the first-row estimation are 5 age group dummies, 15-24, 25-34, 35-44, 45-54, 55-64, and 65+ and six education group levels. For the second estimation Child Worker (ii) the individual level control variables used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. For the third estimation, we include 2012 in our sample, while the specific individual and household head's level control variables are similar to the second estimation. The number of native boys for the 2004-2015 period is 169,957. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

mates (2) and (3), show a negative effect on native male and female child labor. For the arrival of 10 refugees, on average, three native boys and 2-3 native girls drop out of child labor for both definitions. In addition, refugees have adverse effects on hours workers for both genders. However, the impact on hours worked is larger for males than females. Finally, the estimate in columns (2) and (3) show that refugees negatively affect both boys' and girls' labor force participation. This finding is consistent with the results that we find regarding employment estima-

Table 9: Cakir et al. (2021) girls employment replication table

	A. OLS				B. 2SLS			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker1	0.047 (0.048)	-0.202*** (0.053)	-0.222*** (0.062)	-0.155*** (0.057)	0.072 (0.052)	-0.273*** (0.057)	-0.308*** (0.067)	-0.220*** (0.061)
Child Worker2	0.049 (0.047)	-0.231*** (0.051)	-0.252*** (0.060)	-0.177*** (0.055)	0.120** (0.050)	-0.279*** (0.055)	-0.315*** (0.065)	-0.230*** (0.059)
Child Worker3	0.053 (0.046)	-0.195*** (0.050)	-0.183*** (0.057)	-0.162*** (0.055)	0.119** (0.050)	-0.228*** (0.053)	-0.237*** (0.061)	-0.218*** (0.058)
First-Stage					0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared					0.918	0.933	0.952	0.953
F-Statistic					35432	40246	50672	35077
N	154,393	154,393	154,393	154,393	154,393	154,393	154,393	154,393
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the female individuals aged 15-17 in the 2004-2015 Turkish Household Labor Force Survey (excluding the year 2012 for the first two estimations 1, 2). Panel A, columns 1-4, reports the OLS regression analysis, and Panel B, columns 1-4, reports 2SLS regression analysis. Each cell shows the coefficient for each dependent variable under each column specification. For Child Worker (i) we use similar individual and household head level control variables to Cakir et al. (2021). The individuals level control variables used in the first-row estimation are age groups and relationship to household head dummies. The household heads' level control variables used for the first-row estimation are 5 age group dummies, 15-24, 25-34, 35-44, 45-54, 55-64, and 65+ and six education group levels. For the second estimation Child Worker (ii) the individual level control variables used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. For the third estimation, we include 2012 in our sample, while the specific individual and household head's level control variables are similar to the second estimation. The number of native girls for the 2004-2015 period is 168,366. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

tions. The arrival of 10 refugees reduces native boys labor force participation by 2-3 boys and native girls labor force participation by three girls.

Table 10: Labor market outcomes using 2004-2015 sample period

VARIABLES	A. Males				B. Females			
	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Labor defn. 1	-0.113* (0.060)	-0.320*** (0.066)	-0.287*** (0.077)	-0.258*** (0.071)	0.031 (0.044)	-0.203*** (0.048)	-0.318*** (0.057)	-0.066 (0.051)
Child Labor defn. 2	-0.076 (0.060)	-0.291*** (0.066)	-0.251*** (0.077)	-0.230*** (0.070)	0.039 (0.043)	-0.175*** (0.047)	-0.287*** (0.055)	-0.052 (0.050)
Hours/Week defn. 1	0.333 (3.365)	-12.899*** (3.667)	-12.557*** (4.318)	-12.888*** (3.937)	10.966*** (2.425)	-6.175** (2.633)	-13.066*** (3.102)	-1.838 (2.818)
Hours/Week defn. 2	1.614 (3.314)	-12.839*** (3.612)	-12.206*** (4.253)	-12.962*** (3.878)	10.927*** (2.355)	-5.727** (2.557)	-12.117*** (3.012)	-1.864 (2.737)
Out of Labor Force	-0.017 (0.060)	0.224*** (0.065)	0.257*** (0.077)	0.097 (0.070)	-0.115** (0.053)	0.283*** (0.058)	0.328*** (0.068)	0.218*** (0.062)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.920	0.934	0.953	0.954	0.918	0.933	0.952	0.953
F-Statistic	36470	41800	52068	36445	35432	40246	50672	35077
N	155,500	155,500	155,500	155,500	154,393	154,393	154,393	154,393
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all young individuals aged 15-17 in the 2004-2015 Turkish Household Labor Force Survey (excluding the year 2012). Panel A, columns 1-4, reports the 2SLS regression analysis for males, and Panel B, columns 1-4, reports 2SLS regression analysis for females. Each cell shows the coefficient for each dependent variable under each column specification. The individual-level control variables used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. The number of native individuals for the 2004-2015 period is 338,323. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

CHAPTER 7

ROBUSTNESS CHECKS

7.1 NUTS-1 Region-Year Effects

To find other variables that can account for the difference between control and treatment regions, we include the interaction between the NUTS-1 region and year-fixed effects. Aksu et al. (2018) argue that this variable is very flexible, and there is a potential danger since very flexible estimation might capture the total effect of the refugees. However, NUTS-1 regions consist of one or more NUTS-2 regions, and having different NUTS-2 regions with separate shares of refugees makes it necessary to study the variation that remained in the refugee ratio in NUTS-1 regions. In the appendix, Table 11, Panel A and B present the 2SLS estimates for males and females, respectively. Column (5) shows the effect of refugees on native children's labor market outcomes, and its impact is significant for all native boys' outcomes and insignificant for native girls. The results are consistent with previous findings, as can be observed in Table 11, while the magnitude of the coefficient is higher for this estimate.

7.2 New definition of the variable of interest

Initially, the refugees settled in the provinces close to the Turkish-Syrian border. However, a large number of refugees moved to more industrialized and economically developed areas such as the western provinces. Since the majority of the individuals resided close to the border provinces at first, they are residents of

those provinces. However, some refugees may not be living in those provinces, which could lead to measurement error in our variable of interest. To deal with this problem, we construct a treatment variable, which is a dummy variable, taking value one if the refugee to native ratio is above a certain threshold level and zero otherwise. Hence, we run three different analyses, where we set the threshold level at 0.02, 0.04, and 0.1, in Table 12, 13, and 14, in the appendix, respectively. We focus only on 2SLS estimates by gender, and the results show that the previous findings continue to hold under new definitions. However, the coefficients drop compared to prior results.

7.3 Controlling for macro level variables

Comparing a treatment region with a control region is not always easy. Consider two regions, where one of them is a treatment region and the other a control region, several factors differ between the regions. Hence, we cannot claim that the difference between the two regions is due to refugees, as the regions should be identical. Hence, there could be potential bias in our estimates, and to deal with such potential bias, we add the macro-level control variables such as unemployment rate and the logarithm of GDP at the NUTS-1 region level. Since the data regarding macro variables starts from 2006, we focus on the 2006-2018 sample period. In the appendix, Table 15, Panel A and B, we present the results of 2SLS estimates for native boys and girls, respectively. The estimates in Table 15 show that our key findings continue to hold for both native boys and girls. The coefficients are larger compared to prior results.

7.4 Controlling for birth year and school quality

In 2012 The Grand National Assembly of Turkey passed Law No. 6287, which extended the years of compulsory schooling from 8 to 12 years. From Dayioglu

and Kirdar (2020) paper we know that the 1997 Turkish Education Reform had significant effect on child labor. To control for the 2012 education reform, we use children birth year, since the reform would affect all the children born after January 1998. Hence, we construct a dummy variable taking value one if the child is born in year 1998 and after, and zero otherwise. In the appendix, Table 16, we present the results of 2SLS estimates for native boys and girls. The result show that our key findings continue to hold even when we control for children birth year.

Tumen (2018) finds that the arrival of Syrian refugees increases the high-school enrollment of young natives. In 2014-2015 Turkey granted full access to young Syrian refugees to attend public education. Since nearly 45% of the total number of Syrian refugees in Turkey is under the age of 18, there might be a crowding effect. Tumen (2019) find that the enrollment of 31.6 refugee children in public school drives 1 native into private education. Due to the enrollment of Syrian refugees in public education and the increase of students per class, Turkish parents might decide not to send their children in schools, and they might contribute to household economic activity or learn a new occupation. Hence, we use school quality to control for this. The data we use are the 2006-2018 National Education Statistics Formal Education provided by Turkish Statistical Institute (TSI) at NUTS2 region level. The variables we use to account for school quality are: number of children per division, teacher and classroom for both primary and secondary education, respectively. In the appendix, Table 17, presents the results of 2SLS estimates for native boys and girls. Our main findings continue to hold even when we control for school quality. The magnitude of coefficients is larger compared to the main estimates.

CHAPTER 8

CONCLUSION

In this paper, we examine the impact of Syrian refugees on young native labor market outcomes such as employment, working hours, labor force participation, and child labor. To define child labor, we use children working in hazardous jobs, which is one of the four worst forms of child labor. We use a difference in difference IV method and the variation in migrant to native ratio at the regional level to study the impact of refugees. However, there is evidence that our variable of interest could be endogenous since the refugees might choose to settle in more socially and economically developed provinces. Hence, to deal with the endogeneity issue, we use a distance instrument that is commonly used in this literature. Lastly, from the literature, we learn that the common-trend assumption does not hold for all outcome variables. Therefore, we employ region-year time trend controls in all our estimations.

We find that refugees have a positive effect on young male natives. The arrival of 10 Syrian refugees drives one boy into employment. In addition, we do not find any impact on girls. Next, the results show that refugees do not affect child labor and working hours. Since we found a positive effect on the employment of native boys, we expect a positive impact on boys' labor force participation. Hence, we find a positive effect on boys' labor force participation which shows consistency in our results. From the literature, we know that there is heterogeneity in the refugee effect and control for it. We show that the positive impact of refugees on boys' employment is driven by the boys whose household heads' education level

is less than secondary school. We do the same analysis for all other outcomes and both gender and find no effect on all of them apart from the labor force participation of boys who live with a household head who are less educated, as we would expect. We replicate the results of Cakir et al. (2021) and similar effects but different coefficients due to our differences in the variable of interest. Lastly, we show that our results continue to hold under different robustness checks.



REFERENCES

- Akgündüz, Yusuf and van den Berg, Marcel and Hassink, Wolter H.J., The Impact of Refugee Crises on Host Labor Markets: The Case of the Syrian Refugee Crisis in Turkey. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.2564974>
- Aksu, Ege; Erzan, Refik; Kırdar, Murat Güray (2018) : The impact of mass migration of Syrians on the Turkish labor market, Working Paper, No. 1815, Koç UniversityTÜSİAD Economic Research Forum (ERF), Istanbul
- Altonji, J. G., Card, D. (2018). The effects of immigration on the labor market outcomes of less-skilled natives (pp. 137-170). Routledge.
- Aracı, Doğu and Demirci, Murat and Demirci, Murat and Kırdar, Murat G. (2021), Development Level of Hosting Areas and the Impact of Refugees on Natives' Labor Market Outcomes. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3823634>
- Aydemir, A.B. and Kırdar, M.G. (2017). Quasi-experimental impact estimates of immi- grant labor supply shocks: The role of treatment and comparison group matching and relative skill composition. European Economic Review 98, 282-315.
- Borjas, G.J. The analytics of the wage effect of immigration. IZA J Migration 2, 22 (2013). <https://doi.org/10.1186/2193-9039-2-22>
- Card, D. (1990). The impact of the Mariel boatlift on the Miami labor market. ILR Review, 43(2), 245-257.
- Cengiz, D., Tekgüç, H. (2021). Is It Merely a Labor Supply Shock? Impacts of Syrian Migrants on Local Economies in Turkey. ILR Review. <https://doi.org/10.1177/0019793920978365>

- Carrington, W. J., De Lima, P. J. (1996). The impact of 1970s repatriates from Africa on the Portuguese labor market. *ILR Review*, 49(2), 330-347.
- Ceritoglu, E., Yunculer, H., Torun, H. et al. The impact of Syrian refugees on natives' labor market outcomes in Turkey: evidence from a quasi-experimental design. *IZA J Labor Policy* 6, 5 (2017). <https://doi.org/10.1186/s40173-017-0082-4>
- Çakır, S., Erbay, E., Kırdar, M. G. (2021). Syrian Refugees and Human Capital Accumulation of Native Children in Turkey.
- Dayioglu, Meltem and Kırdar, Murat G. (2020), Keeping Kids in School and Out of Work: Compulsory Schooling and Child Labor in Turkey. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3608525>
- Dayioglu, Meltem and Kırdar, Murat G. and Koc, Ismet (2021), The Making of a Lost Generation: Child Labor Among Syrian Refugees in Turkey. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3870197>
- Del Carpio, Ximena V. and Wagner, Mathis Christoph, The Impact of Syrian Refugees on the Turkish Labor Market (August 24, 2015). World Bank Policy Research Working Paper No. 7402, Available at SSRN: <https://ssrn.com/abstract=2650218>
- Dustmann, C., Glitz, A., Frattini, T. (2008). The labour market impact of immigration. *Oxford Review of Economic Policy*, 24(3), 477-494.
- Dustmann, C., Schönberg, U., Stuhler, J. (2017). Labor supply shocks, native wages, and the adjustment of local employment. *The Quarterly Journal of Economics*, 132(1), 435-483.
- Glitz, A. (2012). The labor market impact of immigration: A quasi-experiment exploiting immigrant location rules in Germany. *Journal of Labor Economics*, 30(1), 175-213.
- Hunt, J. (1992). The impact of the 1962 repatriates from Algeria on the French labor market. *ILR Review*, 45(3), 556-572.
- International Labor Organization, (2021, May). ILO's Programme on the Elim-

- ination of Child Labour in Turkey (2021–2025). https://www.ilo.org/wcmsp5/groups/public/---europe/---ro-geneva/---ilo-ankara/documents/publication/wcms_774757.pdf
- Kofol, Chiara and Naghsh Nejad, Maryam (2017), Child Labor and the Arrival of Refugees: Evidence from Tanzania. Available at SSRN: <http://dx.doi.org/10.2139/ssrn.3097360>
- Mansour, H. (2010). The effects of labor supply shocks on labor market outcomes: Evidence from the Israeli–Palestinian conflict. *Labour Economics*, 17(6), 930-939.
- Rachel M. Friedberg, The Impact of Mass Migration on the Israeli Labor Market, *The Quarterly Journal of Economics*, Volume 116, Issue 4, November 2001, Pages 1373–1408, <https://doi.org/10.1162/003355301753265606>
- Ruiz, Isabel, and Carlos Vargas-Silva. 2015. "The Labor Market Impacts of Forced Migration." *American Economic Review*, 105 (5): 581-86. DOI: 10.1257/aer.p20151110
- Ruiz, Isabel and Carlos Vargas-Silva, The labour market consequences of hosting refugees, *Journal of Economic Geography*, Volume 16, Issue 3, May 2016, Pages 667–694, <https://doi.org/10.1093/jeg/lbv019>
- Smith, C. L. (2012). The impact of low-skilled immigration on the youth labor market. *Journal of Labor Economics*, 30(1), 55-89.
- Tumen, S. (2018). The impact of low-skill refugees on youth education. Available at SSRN 3273708.
- Tumen, S. (2019). Refugees and ‘native flight’ from public to private schools. *Economics Letters*, 181, 154-159.
- Winter-Ebmer, R. and Zweimuller, J. (1999). Do immigrants displace young native workers: The Austrian experience. *Journal of Population Economics* 12(2), 327-340.

APPENDIX

Table 11: The effect of Syrian Refugees on young native, NUTS-1 Region-Year interaction fixed effects

	A. Males					B. Females				
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5Region- Year Inter.	(5) NUTS1- Year Inter.	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5Region- Year Inter.	(5) NUTS1- Year Inter.
Child Worker	0.145*** (0.038)	0.082* (0.042)	0.116** (0.053)	0.164*** (0.044)	0.271*** (0.065)	0.262*** (0.031)	-0.007 (0.034)	-0.047 (0.043)	0.051 (0.036)	0.051 (0.053)
Child Labor defn.1	0.077** (0.037)	-0.008 (0.042)	0.063 (0.052)	0.050 (0.044)	0.211*** (0.064)	0.165*** (0.027)	-0.009 (0.030)	-0.062 (0.038)	0.048 (0.031)	0.054 (0.046)
Child Labor defn.2	0.103*** (0.037)	0.015 (0.041)	0.077 (0.052)	0.076* (0.043)	0.222*** (0.064)	0.151*** (0.026)	0.000 (0.029)	-0.056 (0.037)	0.055* (0.031)	0.057 (0.045)
Hours/Week defn.1	9.280*** (2.011)	3.272 (2.261)	3.155 (2.816)	5.784** (2.363)	5.915* (3.487)	14.285*** (1.420)	0.938 (1.591)	-4.228** (1.984)	3.143* (1.662)	-0.933 (2.450)
Hours/Week defn.2	9.513*** (1.980)	2.990 (2.226)	2.647 (2.773)	5.826** (2.326)	5.856* (3.434)	13.420*** (1.379)	0.694 (1.545)	-4.164** (1.927)	2.804* (1.615)	-0.818 (2.380)
Out of Labor Force	-0.207*** (0.037)	-0.152*** (0.042)	-0.120** (0.052)	-0.276*** (0.044)	-0.269*** (0.064)	-0.276*** (0.032)	-0.014 (0.036)	0.033 (0.045)	-0.082** (0.038)	-0.078 (0.055)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.930	0.947	0.963	0.960	0.983	0.927	0.944	0.962	0.959	0.983
F-Statistic	52928	65351	86256	46266	58827	50031	61894	82236	43998	56396
N	210,503	210,503	210,503	210,503	210,503	207,461	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time-trend	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO
NUTS1 time-trend	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	NO	YES	NO
NUTS1-Year FE	NO	NO	NO	NO	YES	NO	NO	NO	NO	YES

Note: The sample includes all the individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for native males, and Panel B, columns 1-4, reports 2SLS regression analysis for native females for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household head level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 12: The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.02), 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.029*** (0.007)	0.016* (0.008)	0.030** (0.013)	0.029*** (0.008)	0.052*** (0.006)	-0.001 (0.007)	-0.012 (0.011)	0.009 (0.006)
Child Labor defn. 1	0.015** (0.007)	-0.001 (0.008)	0.016 (0.013)	0.009 (0.008)	0.033*** (0.005)	-0.002 (0.006)	-0.016 (0.010)	0.008 (0.005)
Child Labor defn. 2	0.021*** (0.007)	0.003 (0.008)	0.020 (0.013)	0.013* (0.008)	0.030*** (0.005)	0.000 (0.006)	-0.015 (0.010)	0.010* (0.005)
Hours/Week defn. 1	1.846*** (0.400)	0.622 (0.430)	0.806 (0.719)	1.009** (0.412)	2.817*** (0.280)	0.178 (0.302)	-1.101** (0.516)	0.546* (0.289)
Hours/Week defn. 2	1.892*** (0.394)	0.569 (0.423)	0.676 (0.708)	1.016** (0.406)	2.646*** (0.272)	0.132 (0.293)	-1.085** (0.502)	0.487* (0.280)
Out of Labor Force	-0.041*** (0.007)	-0.029*** (0.008)	-0.031** (0.013)	-0.048*** (0.008)	-0.055*** (0.006)	-0.003 (0.007)	0.009 (0.012)	-0.014** (0.007)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.624	0.652	0.716	0.703	0.617	0.647	0.715	0.699
F-Statistic	6580	6928	8302	4570	6317	6675	8121	4421
N	210,503	210,503	210,503	210,503	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for males, and Panel B, columns 1-4, reports 2SLS regression analysis for females and each of the 6 dependent variables. The key variable of interest is a treatment dummy that takes value one if the ratio of migrants to natives is greater than 0.02 and zero otherwise. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 13: The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.04), 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.020*** (0.005)	0.013* (0.007)	0.021** (0.009)	0.028*** (0.008)	0.036*** (0.004)	-0.001 (0.005)	-0.008 (0.008)	0.009 (0.006)
Child Labor defn. 1	0.011** (0.005)	-0.001 (0.007)	0.011 (0.009)	0.009 (0.008)	0.023*** (0.004)	-0.001 (0.005)	-0.011 (0.007)	0.008 (0.005)
Child Labor defn. 2	0.014*** (0.005)	0.002 (0.007)	0.014 (0.009)	0.013* (0.007)	0.021*** (0.004)	0.000 (0.005)	-0.010 (0.007)	0.009* (0.005)
Hours/Week defn. 1	1.291*** (0.280)	0.517 (0.357)	0.569 (0.508)	0.999** (0.408)	1.976*** (0.196)	0.147 (0.249)	-0.757** (0.355)	0.538* (0.284)
Hours/Week defn. 2	1.323*** (0.276)	0.472 (0.352)	0.477 (0.500)	1.006** (0.402)	1.856*** (0.191)	0.109 (0.242)	-0.746** (0.345)	0.480* (0.276)
Out of Labor Force	-0.029*** (0.005)	-0.024*** (0.007)	-0.022** (0.009)	-0.048*** (0.008)	-0.038*** (0.004)	-0.002 (0.006)	0.006 (0.008)	-0.014** (0.006)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.735	0.740	0.787	0.781	0.726	0.731	0.780	0.773
F-Statistic	11031	10531	12140	6896	10374	9895	11488	6469
N	210,503	210,503	210,503	210,503	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for males, and Panel B, columns 1-4, reports 2SLS regression analysis for females and each of the 6 dependent variables. The key variable of interest is a treatment dummy that takes value one if the ratio of migrants to natives is greater than 0.04 and zero otherwise. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 14: The effect of Syrian Refugees on young native, Dummy Variable for Treatment Status (Treatment=1 when refugee to native ratio > 0.1), 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.023*** (0.006)	0.013* (0.007)	0.017** (0.008)	0.026*** (0.007)	0.041*** (0.005)	-0.001 (0.005)	-0.007 (0.006)	0.008 (0.006)
Child Labor defn. 1	0.012** (0.006)	-0.001 (0.006)	0.009 (0.008)	0.008 (0.007)	0.026*** (0.004)	-0.001 (0.005)	-0.009 (0.005)	0.008 (0.005)
Child Labor defn. 2	0.016*** (0.006)	0.002 (0.006)	0.011 (0.008)	0.012* (0.007)	0.024*** (0.004)	0.000 (0.005)	-0.008 (0.005)	0.009* (0.005)
Hours/Week defn. 1	1.454*** (0.315)	0.509 (0.351)	0.461 (0.411)	0.914** (0.373)	2.242*** (0.223)	0.145 (0.247)	-0.613** (0.288)	0.493* (0.261)
Hours/Week defn. 2	1.490*** (0.310)	0.465 (0.346)	0.387 (0.405)	0.921** (0.368)	2.106*** (0.216)	0.108 (0.240)	-0.604** (0.279)	0.440* (0.253)
Out of Labor Force	-0.032*** (0.006)	-0.024*** (0.006)	-0.017** (0.008)	-0.044*** (0.007)	-0.043*** (0.005)	-0.002 (0.006)	0.005 (0.007)	-0.013** (0.006)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.800	0.815	0.821	0.851	0.795	0.811	0.817	0.848
F-Statistic	15853	16288	15102	11014	15153	15614	14450	10618
N	210,503	210,503	210,503	210,503	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for males, and Panel B, columns 1-4, reports 2SLS regression analysis for females and each of the 6 dependent variables. The key variable of interest is a treatment dummy that takes value one if the ratio of migrants to natives is greater than 0.1 and zero otherwise. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 15: The effect of Syrian Refugees on young native with macro-level variables (Unemployment rate and Logarithm of GDP), 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.175*** (0.043)	0.182*** (0.050)	0.137** (0.060)	0.230*** (0.054)	0.202*** (0.034)	0.023 (0.040)	-0.021 (0.048)	0.049 (0.043)
Child Labor defn. 1	0.098** (0.042)	0.078 (0.050)	0.082 (0.059)	0.130** (0.053)	0.111*** (0.030)	-0.010 (0.035)	-0.057 (0.042)	0.045 (0.038)
Child Labor defn. 2	0.115*** (0.042)	0.086* (0.049)	0.089 (0.059)	0.140*** (0.053)	0.107*** (0.029)	-0.001 (0.034)	-0.058 (0.041)	0.056 (0.037)
Hours/Week defn. 1	9.079*** (2.258)	6.629** (2.660)	2.711 (3.171)	7.686*** (2.859)	10.008*** (1.548)	0.455 (1.819)	-4.398** (2.169)	1.521 (1.959)
Hours/Week defn. 2	8.937*** (2.223)	5.846** (2.619)	1.923 (3.122)	7.123** (2.815)	9.564*** (1.503)	0.061 (1.766)	-4.855** (2.106)	1.347 (1.902)
Out of Labor Force	-0.157*** (0.042)	-0.179*** (0.050)	-0.105* (0.059)	-0.250*** (0.053)	-0.194*** (0.036)	-0.046 (0.042)	-0.005 (0.050)	-0.081* (0.045)
First-Stage	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
R-Squared	0.938	0.955	0.971	0.968	0.936	0.953	0.970	0.967
F-Statistic	52141	68132	95396	54418	49189	63969	91146	51646
N	182,355	182,355	182,355	182,355	179,019	179,019	179,019	179,019
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the individuals aged 15-17 in the 2006-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for native males, and Panel B, columns 1-4, reports 2SLS regression analysis for native females for 6 dependent variables. The difference between child labor and hours worked per week definitions is that, for the first definition, we use hours worked per week, while in the second definition, we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household head level controls used are, age, gender, six education categories, and household size. The macro-level specific controls are the unemployment rate and the logarithm of GDP which is in the Turkish Lira. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 16: Controlling for Birth Year, 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.145*** (0.038)	0.082* (0.042)	0.116** (0.053)	0.164*** (0.044)	0.262*** (0.031)	-0.007 (0.034)	-0.047 (0.043)	0.051 (0.036)
Child Labor defn. 1	0.077** (0.037)	-0.008 (0.042)	0.063 (0.052)	0.050 (0.044)	0.165*** (0.027)	-0.009 (0.030)	-0.062 (0.038)	0.048 (0.031)
Child Labor defn. 2	0.104*** (0.037)	0.015 (0.041)	0.077 (0.052)	0.076* (0.043)	0.151*** (0.026)	0.000 (0.029)	-0.056 (0.037)	0.055* (0.031)
Hours/Week defn. 1	9.279*** (2.011)	3.271 (2.261)	3.153 (2.816)	5.784** (2.363)	14.286*** (1.420)	0.937 (1.591)	-4.229** (1.984)	3.143* (1.662)
Hours/Week defn. 2	9.512*** (1.980)	2.990 (2.226)	2.646 (2.773)	5.826** (2.326)	13.421*** (1.379)	0.694 (1.545)	-4.165** (1.927)	2.805* (1.615)
Out of Labor force	-0.207*** (0.037)	-0.152*** (0.042)	-0.120** (0.052)	-0.276*** (0.044)	-0.276*** (0.032)	-0.014 (0.036)	0.033 (0.045)	-0.082** (0.038)
N	210,503	210,503	210,503	210,503	207,461	207,461	207,461	207,461
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the native individuals aged 15-17 in the 2004-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for native males, and Panel B, columns 1-4, reports 2SLS regression analysis for native females for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, birth year, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 17: Controlling for school quality, 2SLS Estimates

	A. Males				B. Females			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.138*** (0.051)	0.153*** (0.057)	0.120* (0.065)	0.163*** (0.060)	0.055 (0.041)	-0.026 (0.046)	-0.005 (0.052)	-0.012 (0.048)
Child Labor defn. 1	0.071 (0.051)	0.079 (0.056)	0.113* (0.065)	0.074 (0.060)	0.022 (0.036)	-0.046 (0.040)	-0.044 (0.046)	-0.048 (0.042)
Child Labor defn. 2	0.090* (0.050)	0.102* (0.056)	0.134** (0.064)	0.103* (0.059)	0.019 (0.035)	-0.043 (0.039)	-0.055 (0.045)	-0.035 (0.041)
Hours/Week defn. 1	3.070 (2.723)	4.343 (3.030)	2.774 (3.466)	3.661 (3.197)	2.684 (1.864)	-1.593 (2.080)	-3.503 (2.366)	-2.201 (2.199)
Hours/Week defn. 2	3.459 (2.681)	4.469 (2.984)	2.676 (3.413)	4.241 (3.148)	2.525 (1.810)	-1.972 (2.019)	-4.188* (2.297)	-2.147 (2.135)
Out of Labor force	-0.183*** (0.051)	-0.265*** (0.057)	-0.186*** (0.065)	-0.291*** (0.060)	-0.039 (0.043)	-0.001 (0.048)	-0.021 (0.054)	-0.011 (0.051)
N	182,355	182,355	182,355	182,355	179,019	179,019	179,019	179,019
R-squared	0.243	0.243	0.244	0.244	0.094	0.095	0.095	0.096
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the native individuals aged 15-17 in the 2006-2018 Turkish Household Labor Force Survey. Panel A, columns 1-4, reports the 2SLS regression analysis for native males, and Panel B, columns 1-4, reports 2SLS regression analysis for native females for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. The school quality controls are number of students per division, teacher, and classroom, for both primary and secondary school, respectively. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 18: Placebo Tests

	A. Male				B. Female			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.221*** (0.065)	0.024 (0.073)	0.113 (0.087)	0.029 (0.078)	0.345*** (0.054)	0.042 (0.061)	-0.040 (0.073)	0.049 (0.065)
Child Labor defn. 1	0.222*** (0.064)	0.023 (0.072)	0.088 (0.087)	0.058 (0.077)	0.250*** (0.048)	-0.025 (0.053)	-0.133** (0.064)	0.051 (0.057)
Child Labor defn. 2	0.197*** (0.064)	-0.002 (0.072)	0.078 (0.086)	-0.006 (0.077)	0.258*** (0.046)	0.025 (0.052)	-0.068 (0.062)	0.080 (0.056)
Hours/Week defn. 1	11.186*** (3.677)	2.682 (4.146)	7.416 (4.972)	4.433 (4.439)	16.763*** (2.719)	2.211 (3.045)	-4.127 (3.653)	6.029* (3.255)
Hours/Week defn. 2	11.447*** (3.628)	2.320 (4.091)	7.269 (4.906)	2.627 (4.380)	17.371*** (2.642)	4.130 (2.959)	-1.282 (3.550)	6.750** (3.164)
Out of Labor Force	-0.133** (0.063)	0.164** (0.071)	0.064 (0.085)	0.126* (0.076)	-0.348*** (0.057)	-0.007 (0.064)	0.079 (0.077)	-0.035 (0.069)
N	111,332	111,332	111,332	111,332	111,899	111,899	111,899	111,899
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the native individuals aged 15-17 in the 2004-2011 Turkish Household Labor Force Survey. We move refugee to native ratio of years 2013, 2014, and 2015 to years 2009, 2010, and 2011, respectively. Panel A, columns 1-4, reports the 2SLS regression analysis for native males, and Panel B, columns 1-4, reports 2SLS regression analysis for native females for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 19: Placebo Tests by Household Head Education Level (Boys)

	A. HH Education < Secondary Education				B. HH Education $\geq$ Secondary School			
DEP. VARIABLES	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.187** (0.081)	0.036 (0.091)	0.109 (0.110)	-0.007 (0.097)	0.315*** (0.102)	-0.073 (0.116)	-0.006 (0.136)	0.095 (0.122)
Child Labor defn. 1	0.230*** (0.080)	0.074 (0.091)	0.112 (0.110)	0.076 (0.097)	0.244** (0.099)	-0.117 (0.112)	-0.022 (0.132)	0.020 (0.119)
Child Labor defn. 2	0.214*** (0.080)	0.052 (0.090)	0.105 (0.109)	0.002 (0.097)	0.200** (0.099)	-0.147 (0.112)	-0.030 (0.131)	-0.024 (0.118)
Hours/Week defn. 1	11.873** (4.631)	5.597 (5.213)	9.222 (6.301)	4.366 (5.601)	11.703** (5.613)	-5.851 (6.342)	-1.228 (7.459)	5.249 (6.709)
Hours/Week defn. 2	12.885*** (4.571)	5.704 (5.146)	9.576 (6.220)	2.835 (5.529)	9.655* (5.531)	-7.620 (6.250)	-2.255 (7.350)	2.292 (6.611)
Out of Labor Force	-0.093 (0.077)	0.174** (0.087)	0.086 (0.105)	0.177* (0.093)	-0.256** (0.105)	0.161 (0.119)	0.080 (0.139)	0.001 (0.125)
N	77,474	77,474	77,474	77,474	33,858	33,858	33,858	33,858
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the native boys aged 15-17 in the 2004-2011 Turkish Household Labor Force Survey. We move refugee to native ratio of years 2013, 2014, and 2015 to years 2009, 2010, and 2011, respectively. Panel A, columns 1-4, reports the 2SLS regression analysis for boys whose household heads' education is less than secondary school, and Panel B, columns 1-4, reports 2SLS regression analysis for boys whose household heads' education is equal or greater than secondary school for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.

Table 20: Placebo Tests by Household Head Education Level (Girls)

DEP. VARIABLES	A. HH Education < Secondary Education				B. HH Education $\geq$ Secondary School			
	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction	(1) No time trends	(2) 5 Region time trends	(3) NUTS1 time trends	(4) 5 Region- Year Interaction
Child Worker	0.360*** (0.069)	-0.009 (0.077)	-0.162* (0.093)	0.014 (0.083)	0.277*** (0.074)	0.134 (0.084)	0.219** (0.098)	0.093 (0.089)
Child Labor defn. 1	0.261*** (0.060)	-0.085 (0.068)	-0.265*** (0.082)	0.016 (0.072)	0.232*** (0.067)	0.144* (0.076)	0.203** (0.089)	0.152* (0.081)
Child Labor defn. 2	0.271*** (0.059)	-0.032 (0.066)	-0.189** (0.079)	0.037 (0.070)	0.237*** (0.066)	0.184** (0.074)	0.241*** (0.087)	0.197** (0.079)
Hours/Week defn. 1	18.806*** (3.482)	0.373 (3.888)	-9.700** (4.703)	5.407 (4.160)	11.171*** (3.590)	6.384 (4.037)	8.534* (4.739)	6.659 (4.297)
Hours/Week defn. 2	19.558*** (3.383)	2.437 (3.777)	-6.377 (4.570)	5.647 (4.042)	11.374*** (3.502)	7.912** (3.938)	10.191** (4.623)	8.673** (4.191)
Out of Labor Force	-0.341*** (0.072)	0.065 (0.081)	0.234** (0.098)	-0.007 (0.087)	-0.344*** (0.081)	-0.159* (0.092)	-0.267** (0.107)	-0.059 (0.097)
N	78,406	78,406	78,406	78,406	33,493	33,493	33,493	33,493
NUTS2 FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
5 Region time trends	NO	YES	NO	NO	NO	YES	NO	NO
NUTS1 time trends	NO	NO	YES	NO	NO	NO	YES	NO
5 Region-Year FE	NO	NO	NO	YES	NO	NO	NO	YES

Note: The sample includes all the native girls aged 15-17 in the 2004-2011 Turkish Household Labor Force Survey. We move refugee to native ratio of years 2013, 2014, and 2015 to years 2009, 2010, and 2011, respectively. Panel A, columns 1-4, reports the 2SLS regression analysis for girls whose household heads' education is less than secondary school, and Panel B, columns 1-4, reports 2SLS regression analysis for girls whose household heads' education is equal or greater than secondary school for 6 dependent variables. The difference between child labor and hours worked per week definitions is that for the first definition we use hours worked per week, while in the second definition we use hours worked during the reference week. Each cell shows the coefficient for each dependent variable under each column specification. Other specifications used are Individual and household heads' level control. The individual-level controls used are age, four education categories, and school attendance, while the household heads' level controls used are, age, gender, six education categories, and household size. Standard errors are given in parenthesis. *, **, and *** indicate the significance level at 10%, 5%, and 1%, respectively.