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ESSAYS IN APPLIED MICROECONOMICS

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ESSAYS IN APPLIED MICROECONOMICS

A Ph.D. Dissertation

by

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Department of
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Ankara
July 2024

To my family and friends

ESSAYS IN APPLIED MICROECONOMICS

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

by

ZEYNEP YILMAZ

In Partial Fulfillment of the Requirements for the Degree of
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ECONOMICS
İHSAN DOĞRAMACI BİLKENT UNIVERSITY
ANKARA

July 2024

ESSAYS IN APPLIED MICROECONOMICS
by Zeynep Yılmaz

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 Doctor of Philosophy in Economics.

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ABSTRACT

ESSAYS IN APPLIED MICROECONOMICS

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July 2024

This thesis consists of three essays in Applied Microeconomics. The first essay examines the causal effects of grandmothers' geographical proximity on labour supply decisions of married women with young children in Turkey. We show that living in the same neighbourhood as grandmothers increases the probability of labour force participation and the employment rates of women with young children by 18.2 ppt and 16.4 ppt, respectively. The size of the impact gets smaller as the proximity definition indicates a shorter distance.

The second essay investigates several mechanisms to explore the positive effect of grandmothers' proximity on mothers' labor force participation. These channels include childcare, elderly care, and traditional gender norms. While the elderly care channel does not affect our main results, we argue that grandmothers' proximity affects mothers' labor market outcomes through childcare and traditional gender norm channels.

The third essay analyzes the causal effects of the massive Syrian refugee inflow on natives' health outcomes in Turkey. Exploring potential mechanisms behind health effects, the refugee influx positively affects the health of high-skilled and employed native males, while having no significant impact on low-skilled native males or females. Following the refugee inflow, working conditions for high-skilled males improved and job opportunities for low-skilled males declined

Keywords: labor market, instrumental variable, childcare, family proximity, refugees, health, Turkey.

ÖZET

UYGULAMALI MİKROEKONOMİ ÜZERİNE MAKALELER

Yılmaz, Zeynep

Doktora, İktisat Bölümü

Tez Yöneticisi: Yrd. Doç. Dr. Şaziye Pelin Akyol

Temmuz 2024

Bu tez, Uygulamalı Mikroekonomi alanında üç denemeden oluşmaktadır. İlk deneme, büyükannelerin coğrafi yakınlığının, küçük çocukları olan evli kadınların iş gücü arzı kararları üzerindeki nedensel etkilerini incelemektedir. Birden fazla mekanizmayı inceleyerek, büyükannelerle aynı mahallede yaşamanın küçük çocukları olan kadınların iş gücüne katılım olasılığını ve istihdam oranlarını sırasıyla 18,2 yüzde puan ve 16,4 yüzde puan artırdığını tespit ettik. Etkinin büyüklüğü, yakınlık tanımının daha kısa mesafeyi ifade etmesiyle azalmıştır.

İkinci makale, büyükannelerin yakınlığının annelerin iş gücüne katılımı üzerindeki olumlu etkisini araştırmak için çeşitli mekanizmaları incelemektedir. Bu kanallar arasında çocuk bakımı, yaşlı bakımı ve geleneksel toplumsal cinsiyet normları yer almaktadır. Yaşlı bakımı kanalı ana sonuçlarımızı etkilemezken, büyükannelerin yakınlığının annelerin işgücü piyasası sonuçlarını çocuk bakımı ve geleneksel toplumsal cinsiyet normları kanalları aracılığıyla etkilediğini görüyoruz.

Üçüncü makale, büyük çaplı Suriyeli mülteci akınının, Türkiye'deki yerli nüfusun sağlık sonuçları üzerindeki nedensel etkilerini araştırmaktadır. Sağlık etkilerinin arkasındaki potansiyel mekanizmaları araştırarak, mülteci akınının, eğitimli ve çalışmakta olan yerli erkeklerin sağlığını olumlu yönde etkilediğini, eğitimsiz yerli erkekler veya kadınlar üzerinde ise önemli bir etkisi olmadığını tespit ettik. Mülteci akını sonrasında, eğitimli erkeklerin çalışma koşulları iyileşmiş ve düşük eğitimli erkekler için iş fırsatları azalmıştır.

Anahtar Kelimeler: işgücü piyasası, araç değişken, çocuk bakımı, aile yakınlığı, mülteciler, sağlık, Türkiye.

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TABLE OF CONTENTS

ABSTRACT **iii**

ÖZET **v**

ACKNOWLEDGEMENTS **vii**

LIST OF TABLES **xiii**

LIST OF FIGURES **xix**

1 INTRODUCTION **1**

2 EEFECTS OF GRANDMOTHERS' PROXIMITY ON MOTHERS' LABOR FORCE PARTICIPATION **5**

2.1 Introduction 5

2.2 Conceptual Framework 10

2.3 Data 12

2.4 The Empirical Methodology 18

2.5 Results 21

2.5.1 Main Results 21

2.5.2 Is it the Grandmothers' Proximity or Availability? 27

2.6 Heterogeneity of Results 28

2.7 Robustness Checks 32

2.7.1 Violation of the Exclusion Restriction 32

2.7.2 Violation of the Exogeneity Assumption 33

2.7.3 Placebo Exercise 34

2.7.4 Alternative Specifications and Samples 36

2.7.5 Sample Selection 37

2.8 Conclusion 38

3 EEFECTS OF GRANDMOTHERS' PROXIMITY ON MOTHERS' LABOR FORCE PARTICIPATION: RELEVANT CHANNELS 40

3.1 Introduction 40

3.2 Data 45

3.2.1 Characteristics of Compliers 49

3.3 Mechanisms 51

3.3.1 Childcare Provision Channel 51

3.3.2 Traditional Gender Norms Channel 55

3.3.3 Elderly Care Channel 62

3.4 Conclusion 63

4 THE IMPACTS OF SYRIAN REFUGEES ON NATIVES' HEALTH OUTCOMES 65

4.1 Introduction 65

4.2 Background and Data 70

4.3 Conceptual Framework 76

4.4 The Empirical Methodology 77

4.5 Results 79

4.6 Mechanisms 84

4.6.1 Labor Market 84

4.6.2 Overcrowding in the Health System 90

4.7 Robustness Checks 93

4.8 Conclusion 96

5 CONCLUSION **99**

APPENDICES **115**

A ADDITIONAL RESULTS FOR CHAPTER 2 116

A.1 Potential Violation of the Exclusion Restriction 133

B ADDITIONAL RESULTS FOR CHAPTER 3 139

B.1 Elderly Care Channel 148

C ADDITIONAL RESULTS FOR CHAPTER 4 151

LIST OF TABLES

2.1 Descriptive statistics by grandmothers' geographical proximity 17

2.2 Effects of grandmothers' proximity on mothers' labor market outcomes 23

2.3 First-stage estimation results 24

2.4 Effects of grandmothers' proximity on mothers' labor force force participation and employment status for different subgroups 29

3.1 Descriptive statistics by grandmothers' geographical proximity 48

3.2 Effects of grandparents' proximity on labor force participation of women without young children, fathers, and mothers with young children 52

3.3 Effects of grandmothers' proximity on the employment status of women without young children, fathers, and mothers with young children 53

3.4 Effects of grandmothers' proximity on measures of traditionality by childhood region type 57

3.5 Effects of grandmothers' proximity on the indicators of traditionality for different subgroups 61

4.1 Background Characteristics of Syrian Refugees and Natives in Turkey 72

4.2 Descriptive Statistics 74

4.3 Effect of Refugees on the Health Outcomes 80

4.4 Effect of Refugees on the Health Outcomes Among Subgroups of Natives 82

4.5 Effect of Refugees on the Job Loss Probability 85

4.6 Effect of Refugees on the Job Finding Probability 88

4.7 Effect of Refugees on the Overcrowding 92

4.8 Effect of Refugees on the Health Outcomes, Placebo Tests 94

4.9 Effect of Refugees on the Health Outcomes Excluding Istanbul (NUTS-1 Region) 95

A.1 Family Structure Survey Micro Data Set 2016 116

A.2 Effects of the number of alive grandmothers on mothers' labor market outcomes 117

A.3 Traditionality index by childhood region type 117

A.4 Effects of grandmothers' proximity on mothers' labor force participation and employment status if unpaid family workers are included in the paid labor force and employment 118

A.5 Descriptive statistics by the number of alive grandmothers 119

A.6 Effects of grandmothers' proximity on mothers' labor force participation and employment status 120

A.7 Effects of grandmothers' proximity on mothers' labor market outcomes 121

A.8 Effects of grandmothers' proximity on mothers' labor force participation 122

A.9 Effects of grandmothers' proximity on mothers' employment status . 123

A.10 Effect of mothers' and mothers-in-law's proximity on their daughters' labor market outcomes 124

A.11 Effects of grandmothers' proximity on the health status of the youngest or oldest child in the household 125

A.12 Effects of grandmothers' proximity on labor market outcomes for different samples 126

A.13 Differential effects of grandmothers' proximity on mothers' labor force participation and employment status 127

A.14 Effects of mother's labor force participation on the later death of the grandmother 128

A.15 Differential effect of the number of grandmothers alive on non-college-educated daughters 128

A.16 Effects of grandmothers' proximity on mother's labor market outcomes after dropping potentially endogenous variables 129

A.17 Effects of grandmothers' proximity on mothers' labor force participation and employment status for different sample specifications 130

A.18 Effects of grandmothers' proximity on mothers' labor force participation and employment status using different instrumented and instrumental variables 131

A.19 Effects of grandmothers' proximity on having a young child in the household 132

B.1 Descriptive statistics by the number of alive grandmothers 139

B.2 Descriptive statistics for the complier and non-complier subpopulations 140

B.3 First-stage regression for various subgroups 141

B.4 Effects of the number of alive grandparents on mothers' and fathers' labor market outcomes 143

B.5 Effects of grandmothers' proximity on stating childcare and household chores as a reason for not working 144

B.6 Traditionality index by childhood region type 144

B.7 Differential effects of mothers and mothers in law's proximity on measures of traditionality 145

B.8 Effects of grandmothers' proximity on the indicators of traditionality for different sample specifications in terms of the age of the youngest child in the household 146

B.9 Effects of grandmothers' proximity on labor market status for the subgroup of women who do not reside with their parents 147

B.10 Differential effects of grandmothers' proximity on mothers' labor force participation and employment status for the group of women with sisters or sisters-in-law 150

C.1 First Stage Estimation Results 153

C.2 Table: Effect of Refugees on the Health Outcomes Among Subgroups of Natives when Standard Errors Clustered by the NUTS-1 Region-Treatment Year 154

C.3 Table: Effect of Refugees on the Overcrowding when Standard Errors Clustered by the NUTS-1 Region-Treatment Year 155

C.4 Table: Effect of Refugees on Labor Market Outcomes when Standard Errors Clustered by the NUTS-1 Region-Treatment Year 156

C.5 Effects of Refugees on the Health Outcomes 157

C.6 Effect of Refugees on the Health Outcomes Among Subgroups of Natives if unpaid workers are not included in the employment 158

C.7 Table: Effect of Refugees on the Health Outcomes Among Subgroups of Natives 159

C.8 Table: Effect of Refugees on the Abstract Intensity 159

C.9 Table: Effect of Refugees on Labor Market Outcomes among Natives 160

C.10 Table: Effect of Refugees on Labor Market Outcomes Among Male Natives . . . 161

C.11 Table: Effect of Refugees on Labor Market Outcomes Among Male Natives . . . 162

C.12 Table: Effect of Refugees on Health Outcomes Among Male Natives . 163

C.13 Table: Effect of Refugees on the Overcrowding . . . 163

C.14 Table: Effect of Refugees on the Overcrowding . . . 164

C.15 Effect of Refugees on the Health Outcomes with an Alternative Instrument (Del Carpio & Wagner 2015) . . . 165

C.16 Effect of Refugees on the Health Outcomes Among Subgroups of Natives with an Alternative Instrument (Del Carpio & Wagner 2015) . . 166

C.17 Effect of Refugees on the Health Outcomes with an Alternative Instrument (Altındağ et al. 2020) . . . 167

C.18 Effect of Refugees on the Health Outcomes Among Subgroups of Natives with an Alternative Instrument (Altındağ et al. 2020) . . . 168

LIST OF FIGURES

4.1 Syrian refugees in Turkey, 2013, 2016 and 2019 75

A.1 Female labor force participation in OECD countries by years 116

A.2 Plausibly exogenous technique (LFP) 137

A.3 Plausibly exogenous technique (Employment) 138

C.1 Geographic Distribution of Syrian Refugees Across Regions at the NUTS-1 Level 151

C.2 Trends in Share of Refugees and Natives' Health Outcomes. 2011-2019 152

CHAPTER 1

INTRODUCTION

The labor market dynamics in Turkey present a unique case among OECD countries due to its pronounced socioeconomic isolation. This phenomenon is characterized by the significant separation of individuals and groups based on their socioeconomic status, which affects their opportunities for interaction, mobility, and economic advancement. In Turkey, the labor market is marked by a higher degree of socioeconomic isolation compared to other OECD countries. This isolation manifests in several ways. Workers from lower socioeconomic backgrounds in Turkey often face substantial barriers that prevent them from advancing to higher economic strata. These barriers include limited access to quality education, fewer professional networks, and inadequate social support systems. As a result, individuals from disadvantaged backgrounds remain confined to lower-paying and less secure jobs, with restricted prospects for upward mobility. The disparity in access to education and vocational training exacerbates the socioeconomic divide in Turkey. Individuals from lower-income families often have limited opportunities to acquire the skills and qualifications necessary for higher-paying jobs. This educational gap perpetuates the cycle of poverty and limits social mobility, further isolating these groups within the labor market. Socioeconomic isolation in Turkey is also influenced by regional disparities. Rural areas and less developed regions tend to have higher rates of poverty and unemployment compared to urban centers. Workers in these regions often face additional challenges in accessing quality education, healthcare, and employment opportunities, contributing to their socioeconomic isolation.

There is a vast amount of literature that argues that one of the most important determinants of low female labor force participation in Turkey is education (Tansel 2002, Başlevent & Onaran 2003, Dayıoğlu & Kırdar 2010). In addition, social norms and cultural factors play an important role in the formation of female labor force participation (Uraz et al. 2010, Akyol & Ökten 2022). Some attempt to identify this by focusing on religiosity/conservatism (Göksel 2013, Guner & Uysal 2014, Atasoy 2017), while others attribute the observed low participation rates in Turkey to the prevailing societal view that predominantly associates women with caregiving and housework. (İlkkaracan 2012, O'Neil & Bilgin 2013, Gedikli 2014, Dildar 2015).

In the first chapter, we investigate the causal effects of grandmothers' geographical proximity on the labor supply decisions of married women with young children by leveraging a novel data set from Turkey. We deal with reverse causality and endogeneity problems. arising from mothers' and grandmothers' joint location and labor supply decisions by implementing a two-stage least squares estimation method using the number of alive grandmothers as an instrument. We argue that grandmothers' proximity can increase. mothers' labor supply through their free and flexible childcare services. On the other On the other hand, geographically close grandmothers can reduce mothers' labor supply by imposing the traditional gender norms prevalent in Turkey or requiring them to take on the elderly caregiving duties. The overall effect depends on the relative size of these opposing factors. Our findings suggest that living in the same neighborhood as grandmothers increases the probability of labor force participation and the employment rates of women with young children.

In the second chapter of this thesis, we investigate the positive impact of grandparental proximity on their daughters' labor market outcomes in Turkey, emphasizing childcare, elderly care, and traditional gender norms as possible channels. We argue that grandmothers' proximity can increase mothers' labour supply through their free and flexible childcare services. On the other hand, geographically close grandmothers can reduce mothers' labour supply by imposing the traditional gender norms prevalent in Turkey or requiring them to take on elderly caregiving duties. Our findings reveal that while grandmothers' proximity affects mothers' labour market outcomes through childcare and traditional gender norm channels, we report no evidence of the elderly care channel. These results highlight the complexity of the effects of the availability of grandparents at a geographically close distance.

In the third chapter, we examine the causal effects of the massive Syrian refugee inflow on natives' health outcomes using data from the Turkish Income and Living Conditions Survey. We address endogeneity issues raised by refugees' location preferences by implementing a two-stage least squares estimation method using a distance-based instrument. We find that the refugee inflow improved the health of high-skilled and employed males, whereas the effects on low-skilled native males are insignificant. We find no evidence of a significant health effect on females. We also investigate the potential channels through which refugees can affect natives' health outcomes and show evidence that the improvements in high-skilled males' working conditions and reduced probability of finding a job for low-skilled males drive our results.

In this study, we highlight the need for policies that promotes labor force participation of women who are at risk of withdrawing from the labour market. Addressing gender inequality in labor force participation in Turkey requires a focus on providing affordable, high-quality, and accessible childcare services through both formal and informal institutions. Our research contributes to the literature on the determinants of female labor force participation in Turkey, particularly highlighting the role of geographically proximate grandparents who can offer free and flexible childcare. Additionally, we explore how grandparents may influence women's labor participation by monitoring behavior, imposing traditional gender roles, and necessitating intergenerational transfers of time for elder care. We also consider the impact of socioeconomic background characteristics alongside external factors. The thesis further demonstrates that the massive Syrian refugee inflow has varied health impacts on people with different backgrounds. Hence, it is crucial to address the issue of socioeconomic isolation in Turkey's labor market and demography and implement comprehensive policy interventions.

CHAPTER 2

EEFECTS OF GRANDMOTHERS' PROXIMITY ON MOTHERS' LABOR FORCE PARTICIPATION

2.1. Introduction

Female labor force participation has important implications for women and the economies they live in. It improves women's bargaining and decision-power within the household (Anderson & Eswaran 2009, Majlesi 2016). It is also an important driver of growth and development (Verick 2018, Klasen 2019). Yet, in many countries, such as India, Turkey, Saudi Arabia, and Mexico, female labor force participation rates stay low. Several factors, such as education level, gender norms, culture, fertility rates, and childcare facilities, affect female labor force participation decisions (Leibowitz & Klerman 1995, Vuri 2016, Akyol & Ökten 2022). In this chapter, we investigate the effect of grandmothers' geographical proximity on the labor supply decisions of married women with young children by using the 2016 Turkish Family Structure Survey.

In Turkey, as of 2019, women's labor force participation was 38.7%, which is below the OECD average of 65% (see Figure A.1).[1] According to the 2016 TFSS,

[1] There is a vast amount of literature that argues that one of the most important determinants of low female labor force participation in Turkey is education (Tansel 2002, Başlevent & Onaran 2003,

75% of women state that they are not working because they do household chores, elderly care, or child-rearing (see Table A.1). Especially the unskilled group of women that constitutes a large share of women in Turkey opts to leave the labor market due to the combination of low market wages and high reservation wages (Dayıoğlu & Kırdar 2010). Another important determinant of female labor force participation is the presence of a young child, which discourages women from entering the labor market, in part due to the absence of available and/or affordable formal childcare services. A recent report by the World Bank (2015) presents that there is a lack of affordable and quality childcare service providers to satisfy the needs of full-time working parents in Turkey. The most affordable childcare services, such as publicly provided daycare, offer a half-day service that is incompatible with full-time working mothers' needs. Additionally, the lack of childcare centers nearby can lead to exhausting drop-off and pick-up routines, or it may hinder working mothers' ability to respond promptly to unexpected childcare needs. As a result, many women are left with the choice of either caring for their children themselves or relying on free childcare offered by relatives. Therefore, understanding the causal relationship between women's decision to work and grandmothers' proximity, along with the potential mechanisms through which grandmothers' proximity may affect mothers' labor market outcomes, has important policy implications.

Examining the causal relationship between grandmothers' geographical proximity and mothers' labor force participation decisions is empirically challenging, as mothers' labor supply decisions and grandmothers' or mothers'

Dayıoğlu & Kırdar 2010). In addition, social norms and cultural factors play an important role in the formation of female labor force participation (Uraz et al. 2010, Akyol & Ökten 2022). Some attempt to identify this by focusing on religiosity/conservatism (Göksel 2013, Guner & Uysal 2014, Atasoy 2017), while others attribute the observed low participation rates in Turkey to the prevailing societal view that predominantly associates women with caregiving and housework (İlkkaracan 2012, O'Neil & Bilgin 2013, Gedikli 2014, Dildar 2015).

residential choices might be made simultaneously. Besides, unobserved factors can affect both work decisions and residential preferences. In particular, those who have grown up in more traditional families are more likely to stay closer to their mothers or mothers-in-law (Aytaç 1998, Aykan & Wolf 2000), and they are less likely to work (Göksel 2013, Dildar 2015, Atasoy 2017). In this chapter, we employ the instrumental variable estimation method, utilizing the number of alive grandmothers as an instrument for the grandmothers' geographical proximity, to address the issues of endogeneity and reverse causality associated with the grandmothers' geographical proximity.

We first show that the number of alive grandmothers is a strong predictor of having at least one grandmother residing at a close distance.[2] Our results show that living in the same neighborhood or closer to a mother or mother-in-law leads to an 18.2 and 16.4 percentage points (ppt) increase in labor force participation and employment probabilities of married women with young children, respectively. When we define proximity as living in the same town with at least one grandmother, we find a 13.6 ppt and 12.3 ppt increase in the mothers' labor force participation and employment probabilities. Our estimates have slightly decreased, as expected, to 13.2 ppt and 11.9 ppt when we define close geographical proximity as living in the same city.

After establishing the effect of proximity on mothers' labor market outcomes, we implement heterogeneity analyses. We observe a significant and positive impact of grandmothers' proximity on labor market outcomes for mothers who have grown up in city or town centers (non-village). Conversely, the effects for mothers who

[2] 'Close distance' refers to a relatively small distance between the location of the mother and the location of at least one grandmother. The term 'Close proximity' has three distinct definitions, each of which implies having a grandmother living within certain distance thresholds: (i) in the same neighborhood/district/village or closer; (ii) in the same town or closer; and (iii) in the same city or closer. If no grandmothers residing nearby or within these defined proximity thresholds, the proximity variable is set to zero.

have grown up in villages are small and statistically insignificant. In a separate heterogeneity analysis, we divide our sample into conservative and non-conservative groups according to our constructed traditionality index.[3] Our results show that grandmothers' proximity affects labor market outcomes positively and significantly only in the non-conservative group. Further heterogeneity analysis reveals that the results are driven by less educated women whose reservation wage would be more sensitive to the cost of formal childcare. Similarly, the results are much stronger for women who do not own a house, which can indicate low income levels. We also show that the main results are driven by the effect of the mother rather than the mother-in-law. Finally, we check our results' robustness and show that they are not sensitive to different sample specifications.

This chapter, firstly, is related to the literature that investigates the effects of family structure on women's labor market outcomes. The literature shows that co-residence with elderly parents has a significant positive effect on married women's labor market outcomes in Japan (Ogawa & Ermisch 1996, Sasaki 2002) and in China (Maurer-Fazio et al. 2011), and (Shen et al. 2016). Shen et al. (2016) also show that the positive impacts of this living arrangement are more prominent in urban areas than in rural areas, which is also consistent with our results. Two recent papers examine effects of co-residing grandmothers' deaths on mothers' employment and labor force participation. Khanna & Pandey (2021) find that a mother-in-law's death reduces her daughter-in-law's labor force participation in the Indian context, and Marcos (2023) finds that the deaths of co-residing grandmothers reduce mothers' employment rate in the Mexican context.[4] Conversely, Dhanaraj & Mahambare (2019) examine co-residing family members in

[3] Those with a traditionality index above the median are defined as conservative, and the rest are considered as non-conservative.

[4] Our reduced form results presented in Table A.2, where we investigate the effect of the number of alive grandmothers on mothers' labor force participation rate, are consistent with the findings of Khanna & Pandey (2021) and Marcos (2023).

rural India and report decreased non-farm employment, attributed mainly to reduced autonomy for women. Our chapter emphasizes the importance of considering the relationship between family dynamics, cultural factors, and women's employment choices. It underlines the need to recognize and address the intergenerational relationships that can be impediments or facilitators of women's labor force participation and employment.

The chapter is most closely related to Compton & Pollak (2014). Compton & Pollak (2014) show that close geographical distance to mothers or mothers-in-law has a positive impact on the labor supply of married women with young children, and the proximity works through the mechanism of childcare in the U.S. To deal with the endogeneity of grandparents' geographical proximity, they consider a sample of military wives, as their husbands' locations are largely determined by the military. Due to data limitations, they do not observe the geographical distance between the respondent and her mother. Instead, they use the information based on whether the mother lives in her birth state as a proxy for distance to the grandmother in their analysis, accounting for endogeneity. Different from Compton & Pollak (2014), we observe the information on geographical proximity more precisely and solve the endogeneity problem for the whole sample, not just a subsample. We also provide further insight into the subject using alternative measures of proximity.

The organization of the chapter is as follows: In the next section, we propose a simple conceptual framework that explains how grandmothers' proximity can affect mothers' labor market outcomes. Section 2.3 describes the data. We explain the methodology in Section 4.4 and report the main results in Section 4.5. In Section 2.6, we investigate the heterogeneity of our results, and in Section 4.7, we implement several robustness checks to verify the validity of our findings. Section

4.8 concludes the chapter.

2.2. Conceptual Framework

In this section, we consider the relevant conceptual perspectives that depict possible channels through which grandmothers' proximity can affect labor supply decisions of married women with children and review the related empirical literature. Grandmothers' proximity can affect mothers' labor supply decisions through childcare transfers. As Heckman (1974) and Blau & Robins (1988) mention, childcare services can be provided informally, most often by a relative, either unpaid or low-cost in monetary terms. Considering a neoclassical labor supply model, the availability of free/reduced-cost caregiving services would decrease mothers' reservation wages, thereby increasing their labor force participation and employment rates (Cardia & Ng 2003, Belan et al. 2010, Dimova & Wolff 2011). Besides, it is plausible that the probability of receiving help with childcare from grandmothers increases as proximity gets closer. Therefore, we expect that the impact of grandmothers' proximity on mothers' labor supply increases as the geographical distance between mothers and grandmothers gets closer (Garcia-Moran & Kuehn 2017). In addition, the impact of grandparental proximity on mothers' labor supply is expected to vary across women of different earnings capacities. The free childcare transfer by grandmothers would result in a relatively greater reduction in the reservation wage for mothers with lower earnings capacities. Therefore, if we only consider the childcare transfer channel, we expect to observe a larger effect of grandmothers' proximity on the labor force participation rate of women with lower earning capacities. In our empirical specification, we proxy earning capacity with education level and house ownership and investigate the heterogeneity of our results.

Contrary to the childcare transfer mechanism, which contributes to the increased labor supply of women with children, intergenerational transfers may also operate the other way around. Care duties to older relatives in need may hinder women's labor market participation (Ettner 1996, Kolodinsky & Shirey 2000, Pagani & Marenzi 2008, Maurer-Fazio et al. 2011). Especially in traditional families with strong family ties and gender norms, home production in the form of elderly care or childcare is mainly performed by women (Alesina & Giuliano 2010).[5] Therefore, we expect upward time transfers to be a constraint for women who have grown up in more traditional family environments. As the proximity between grandmothers and mothers gets closer, this channel is more likely to work in the opposite direction to decrease mothers' labor supply. Therefore, we will also investigate our results for women who have grown up in more traditional areas, which we proxy by whether they were raised in a village or not.[6] We investigate the effects of the elderly care channel on our results by excluding individuals in co-residency from our analysis since, in the literature, informal caregiving to an older person is typically proxied by co-residency (see Pezzin & Schone (1999)).[7]

Apart from intergenerational transfers of time in the form of grandparenting or elder care, geographically close grandmothers can also impose traditional gender norms and reduce women's employment by restricting women's decision-making authority or access to resources, such as education and information (Debnath 2015, Dhanaraj & Mahambare 2019, Khanna & Pandey 2021). We expect this reduction to be more pronounced among women raised in villages, who have a comparative advantage in household production and are exposed to more traditional gender

[5]Similar patterns are observed in Turkey. According to the 2016 Research on Family Structure Survey data set, the Ministry of Family, Labor and Social Services (Turkey) reports that daughters-in-law and daughters are the main providers of care to the elderly (27.8% and 23.1%, respectively).

[6]Table A.3 shows that among the women raised in villages, traditionality or religiosity is more prevalent.

[7]We cannot analyze the sample of women co-residing with elderly parents as we only have 388 observations.

norms. Similarly, as grandmothers' proximity gets closer, it is easier for them to monitor mothers' behaviors. Therefore, the probability of imposing restrictive gender norms may increase as grandmothers' geographical distance gets closer.

Considering these channels, predicting the overall impact of grandmothers' proximity on mothers' labor force participation is challenging. Subsidizing a grandparent's time may raise labor supply (Cardia & Ng 2003). However, if there are strong gender norms against women's employment or an increase in daughters' provision of caregiving to their elderly parents, such a policy may backfire. Therefore, it requires an empirical investigation to understand the direction of the effect.

2.3. Data

In this chapter, we use the 2016 Turkish Family Structure Survey (TFSS), which was conducted by the Turkish Statistical Institute and the Ministry of Family and Social Policies. The TFSS is collected to understand the changes in family structures and lifestyles in Turkey. The survey was conducted between June 1 to September 26, 2016 among 35,475 individuals in 17,239 households. It is representative at the NUTS-1 level and in three major provinces (İstanbul, İzmir, Ankara). The survey consists of Individual and Household questionnaires. The Individual questionnaires cover all individuals over 15 years old who live in a household and contain information on demographics, family structure, labor market outcomes, and a unique identifier that helps us match with their partners, if available. It also consists of questions about the proximity of residence of the mother and the mother-in-law. More specifically, it includes the questions: "What is the proximity of residence of your mother?" and "What is the proximity of residence of your mother-in-law?" The possible answers are: non-existent, dead, same house, same building, same neighborhood/district/village, same city and same town, same city but a different town, different city, abroad. We use these variables to determine whether grandmothers are alive and whether they live close by. Household questionnaires collect data on all the individuals in a household, including children under 15 years old, and contain information about household resources.

We also construct four different outcome variables to measure levels of traditionality and religiosity: i) Son Preference, ii) Finding Women's Working Inappropriate, iii) Not Approving of Interdenominational Marriages, and iv) Traditionality Index. We use two survey questions to construct the 'Son Preference' variable. The survey respondents are asked whether they totally disagree, disagree, partially agree, agree, or strongly agree with the following statements: "A son makes a mother more respectable." and "Only a son can ensure the continuation of the family bloodline." If the respondent agrees or strongly agrees with any of these statements, the 'Son Preference' variable is coded as one, and zero otherwise.

Our second key variable, 'Finding Women's Working Inappropriate,' is constructed by using the survey question "Do you find women's working appropriate?" If the answer to this question is "No," we code it as one, and zero otherwise.

We also construct a 'Not Approving Interdenominational Marriages' variable by using the survey question that asks respondents whether they totally disagree, disagree, partially agree, agree, or strongly agree with the statement, "People from different religious sects can marry each other." We define it as one if the respondent disagrees or totally disagrees with the statement, and zero otherwise. Finally, we construct an index for conservatism, which is the first principal component of the four variables used for constructing the three traditionality and religiosity variables.

In this chapter, we investigate the role of grandmothers' geographical distance on mothers' labor market outcomes. Therefore, we restrict our sample to married mothers aged 18–50 who live in a co-habiting union with *at least one child ten years old or younger*.[8,9,10] We exclude single mothers, as our data do not include information on husbands unless they live in the same household. After dropping observations with missing values, the sample consists of 3,542 observations of a relatively homogenous group of women.[11]

We define two labor market outcomes: (1) labor force participation (LFP), a variable taking the value of one if the mother is employed or looking for a job and zero otherwise; and (2) employment, which is equal to one if she worked at least an hour during the reference period and zero otherwise. To focus on paid and formal employment in the form of a regular employee, casual employee, employer, or self-employed worker, LFP and employment measures are set to zero if the mother works as an unpaid worker.[12,13,14]

[8] In Turkey, primary education includes two four-year levels. Children aged 6 to 9 attend the first level of primary education and attend the second level when they turn 10.

[9] Our results are robust to using 40 or 45 as an age cut-off for mothers.

[10] We show that our results are robust to using different age thresholds for children in Section 4.7.

[11] The proportion of single mothers is only 6% in the nationally representative sample survey (TFSS, 2016).

[12] The effects of grandmothers' proximity on mothers' LFP and employment are not expected to be the same ex-ante for at least two reasons. There might be discrimination against women with children in the labor market and/or having children might have changed mothers' preferences about job characteristics, such as flexibility or close location. Assuming that grandmothers' proximity does not affect the degree of discrimination against women with children and mothers' preferences about job characteristics, grandmothers' proximity is expected to have a smaller impact on mothers' employment rates. Therefore, to get a better sense of the impact of grandmothers' proximity, we consider both supply and demand-side factors by focusing on both labor force participation and the employment status of women as outcome variables.

[13] The results of the analysis are unchanged if unpaid family workers are included in the paid labor force and employment. These results are presented in Table A.4.

[14] We also exclude individuals continuing their education or those who are retired or disabled from our analysis.

We construct three different variables for the geographical proximity of grandmothers. Each variable is equal to one if at *least one* of the grandmothers lives (i) *in the same neighborhood/village/ district or closer*, (ii) *in the same town or closer*, or (iii) *in the same city or closer, and zero otherwise.*[15] We label the first proximity measure as 'District,' the second one as 'Town,' and the last one as 'City.' Note that the proximity variable 'District' denotes the shortest distance, 'Town' denotes the medium distance, and 'City' denotes the longest distance.

Table 2.1 reports the summary statistics by the proximity of the grandmothers' residence for each proximity definition. According to Table 2.1, mothers who live at a geographically close distance to their mothers or mothers-in-law are more likely to have a primary education but less likely to complete tertiary education. We observe a similar pattern in their partners' education. Women who live close to either their mother or mother-in-law have a weaker labor force attachment, tend to have younger children, are less likely to have older children, and have more traditional gender views. These statistics highlight the fact that there is selection in these groups (i.e., residential location choice depends on the observed and unobserved characteristics of mothers). Therefore, we address the endogeneity problem in our empirical strategy using the IV strategy, employing IV estimation method by using the number of alive grandmothers as an instrument for proximity.

In Table A.5, we present descriptive statistics by the number of available grandmothers, our instrument. In addition to differences in educational outcomes

[15] In the survey we use in the chapter, proximity measures are ordered in the following way: i) Same house, ii) Same building, iii) Same neighborhood/district/village, iv) Same city, same town, v) Same city, different town, vi) Different city, and vii) Abroad. The smallest administrative units are neighborhoods, followed by districts and villages. A 'district' refers to a smaller urban administrative unit, similar to neighborhoods within a city. 'Villages' are grouped together within a town, and several villages may be part of the same town. A 'town' refers to a larger administrative unit that encompasses both urban and rural areas. It is generally larger in scale compared to 'district' and may have more developed infrastructure and services. The term 'city' refers to large urban areas or metropolitan centers in Turkey. Cities are higher-level administrative units encompassing multiple neighborhoods, districts, and towns.

and the number of children, there is a substantial difference in mothers' average age across the groups. In our estimation, we address this problem by controlling for age fixed effects.

Table 2.1: Descriptive statistics by grandmothers' geographical proximity

	District		**Town**		**City**	
	Distant	Close	Distant	Close	Distant	Close
Labor force participation	0.273	0.209	0.265	0.242	0.269	0.245
	(0.446)	(0.407)	(0.441)	(0.428)	(0.444)	(0.430)
Employment	0.259	0.199	0.255	0.228	0.256	0.232
	(0.438)	(0.399)	(0.436)	(0.420)	(0.437)	(0.422)
Age	34.090	32.792	34.658	33.072	34.782	33.296
	(6.303)	(6.194)	(6.489)	(6.119)	(6.637)	(6.157)
Primary school or less	0.430	0.544	0.435	0.490	0.431	0.482
	(0.495)	(0.498)	(0.496)	(0.500)	(0.496)	(0.500)
Primary education	0.169	0.198	0.164	0.187	0.160	0.185
	(0.375)	(0.398)	(0.370)	(0.390)	(0.367)	(0.388)
Secondary education	0.190	0.159	0.180	0.178	0.165	0.183
	(0.392)	(0.366)	(0.384)	(0.383)	(0.371)	(0.386)
Tertiary education	0.212	0.100	0.221	0.145	0.244	0.151
	(0.409)	(0.299)	(0.415)	(0.352)	(0.430)	(0.358)
Primary school or less (husband)	0.309	0.426	0.312	0.372	0.314	0.362
	(0.462)	(0.495)	(0.464)	(0.484)	(0.465)	(0.481)
Primary education (husband)	0.140	0.203	0.124	0.183	0.116	0.176
	(0.347)	(0.402)	(0.329)	(0.387)	(0.32)	(0.381)
Secondary education (husband)	0.241	0.239	0.209	0.257	0.183	0.256
	(0.428)	(0.426)	(0.407)	(0.437)	(0.387)	(0.437)
Tertiary education (husband)	0.310	0.132	0.355	0.188	0.387	0.206
	(0.463)	(0.339)	(0.479)	(0.391)	(0.487)	(0.405)
Employed (husband)	0.932	0.886	0.927	0.909	0.932	0.910
	(0.252)	(0.318)	(0.260)	(0.288)	(0.251)	(0.286)
Childhood region: City center	0.398	0.318	0.348	0.380	0.355	0.373
	(0.490)	(0.466)	(0.477)	(0.486)	(0.479)	(0.484)
Childhood region: Town center	0.322	0.269	0.324	0.291	0.321	0.298
	(0.467)	(0.444)	(0.468)	(0.454)	(0.467)	(0.457)
Childhood region: Village	0.280	0.413	0.328	0.328	0.325	0.329
	(0.449)	(0.493)	(0.470)	(0.470)	(0.469)	(0.470)
Child aged 0–5 in the household	0.653	0.678	0.626	0.681	0.606	0.677
	(0.476)	(0.467)	(0.484)	(0.466)	(0.489)	(0.468)
Child aged 15 and above	0.216	0.210	0.244	0.198	0.257	0.202
	(0.412)	(0.407)	(0.430)	(0.399)	(0.437)	(0.402)
Number of young children	1.523	1.657	1.510	1.604	1.481	1.597
	(0.692)	(0.796)	(0.687)	(0.756)	(0.677)	(0.748)
Son preference	0.296	0.410	0.314	0.349	0.332	0.338
	(0.456)	(0.492)	(0.465)	(0.477)	(0.471)	(0.473)
Finding women's working inappropriate	0.082	0.088	0.081	0.086	0.083	0.084
	(0.274)	(0.283)	(0.273)	(0.280)	(0.276)	(0.278)
Interdenominational marriage is not allowed	0.490	0.554	0.502	0.520	0.506	0.516
	(0.500)	(0.497)	(0.500)	(0.500)	(0.500)	(0.500)
Traditionality index	0.420	0.541	0.434	0.480	0.456	0.466
	(0.453)	(0.501)	(0.452)	(0.485)	(0.476)	(0.474)
Lives in childhood region	0.628	0.814	0.474	0.812	0.308	0.803
	(0.484)	(0.389)	(0.500)	(0.391)	(0.462)	(0.398)
Husband childhood region	0.656	0.847	0.512	0.838	0.357	0.828
	(0.475)	(0.36)	(0.500)	(0.369)	(0.479)	(0.378)
Only one grandmother alive	0.221	0.152	0.247	0.169	0.248	0.181
	(0.415)	(0.359)	(0.432)	(0.375)	(0.432)	(0.385)
Both grandmothers alive	0.738	0.848	0.677	0.831	0.632	0.819
	(0.440)	(0.359)	(0.468)	(0.375)	(0.482)	(0.385)
Only one grandfather alive	0.324	0.341	0.337	0.327	0.345	0.326
	(0.468)	(0.474)	(0.473)	(0.469)	(0.476)	(0.469)
Both grandfathers alive	0.576	0.559	0.543	0.584	0.522	0.583
	(0.494)	(0.497)	(0.498)	(0.493)	(0.500)	(0.493)
Observations	2,256	1,286	1,221	2,321	770	2,772

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

2.4. The Empirical Methodology

We estimate the impact of grandmothers' proximity on mothers' labor force participation and employment decisions using an instrumental variable approach as the residential choice is endogenous. Grandmothers' choice of residence and mothers' labor supply decisions might affect each other. A woman who is already working may have her mother or mother-in-law relocate nearby to help with childcare and housework, which would lead to a positive bias in a basic linear probability model. On the other hand, family structure and labor force participation are related. In more traditional families, there is a lower probability that women will participate in the labor market and a higher likelihood that they will prefer to stay close to their mothers or mothers-in-law, which will generate a negative bias. Therefore, the overall direction of the bias is ambiguous.

We examine the impact of grandmothers' proximity using the following model:

$$L_{igr} = \psi + \alpha P_i + \gamma_g + \phi_r + {X_{igr}}'\beta + \epsilon_{igr} \, , \tag{2.1}$$

where L_{igr} is the labor market outcome of the individual i at age g and raised in childhood region r. P_i is a binary variable that takes a value of one if individual i's mother and/or in-law lives close, as defined in the previous section. γ_g is age fixed effects and ϕ_r stands for childhood region (region in which the individual lived longest until the age of 15) fixed effects. X_{igr} is a vector of all other control variables in the model, including education category fixed effects for both spouses, whether the spouse works, the current region fixed effects, type of the childhood settlement fixed effects, whether the self or the spouse has a chronic illness, presence of preschoolers in the household, presence of an older child, and the number of children aged 10 years or younger.[16] The coefficient α captures the effect of the grandmother's proximity on the mother's labor market outcome, and ϵ_{igr} represents the error term.

In our analysis, we use the number of grandmothers alive as an instrument for grandparents' proximity. To account for any dependence at the regional level, we cluster standard errors at the region of childhood residence (NUTS-2, 26 Regions) by age level.[17]

Education is defined as four dummy variables representing primary education, secondary education, tertiary education, and a baseline category that corresponds to primary school or less.[18] The husband's income and employment status tend to be correlated with labor supply decisions of married women through assortative mating or the income effect. The rising income of the spouse might generate an income effect and motivate household members to withdraw from the labor market; therefore, we include the husband's educational attainment level as a proxy for his income (Maurer-Fazio et al. 2011).

Older women tend to have deceased parents and a weak labor force attachment because of severe health diseases. If the woman's age is not controlled properly, our instrument may not satisfy the exclusion restriction assumption. Therefore, we include women's age fixed effects as controls in our estimation. Similarly, by using

[16]Our main results are robust to controlling for age at first marriage, age of the youngest child in the family, or close proximity to a sister or a sister-in-law.

[17]Furthermore, we cluster standard errors at the current region (NUTS-1 level) by age level as an alternative specification of the model and present results in Table A.6, which are very similar to our baseline results. As an additional robustness exercise, we cluster standard errors at both the regional level (26 clusters) and age level (33 clusters) and present wild bootstrap cluster p-values in Table A.7.

[18]Primary education refers to the completion of junior high school, vocational junior high school, or primary education. The secondary education dummy indicates whether the individual completed high school, vocational or technical high school. Tertiary education is a dummy variable capturing whether the individual completed at least two years of higher education.

a set of dummy variables for women's childhood region (NUTS-2 level) and type of childhood settlement (province center, town center, or village), we aim to capture differences in family structure and attitudes towards women's employment across regions. In order to control for the differences in labor market opportunities and availability of childcare providers, dummy variables for the region of residence (NUTS-1 level) are included in the analysis.[19]

There is also a possibility that grandmothers may live close to offer care to their daughters or sons experiencing health issues. To take this channel into account, we use a dummy variable indicating whether the woman or her spouse has a chronic illness. Finally, we include an indicator variable for the presence of a child aged 15 and above in the household who might share the burden of childcare duties and two additional variables measuring childcare cost (e.g., the number of children ten years old or below, and whether the youngest one is under 6). We further discuss the validity of our instrument and the robustness of our results when there is a relaxation of the exclusion restriction in Section 4.7.

In our analysis, IV estimates capture the local average treatment effect (LATE) for women whose proximity to grandparents depends on the existence of grandmothers (compliers), while the OLS estimates capture the association between short-distance grandparents and the labor market outcomes of mothers. Living close to the mother or mother-in-law is a joint decision of the mothers and grandmothers. Therefore, it is hard to expect that the proximity to the grandmothers, the treatment variable, is randomly assigned. First, mothers with higher socioeconomic status might have preferences that lead them to prefer living further away from their mothers or in-laws, and they may never use grandparental childcare (never takers). Second, compliers are mothers who live close to a

[19] The information on the current region of residence is only available at the NUTS-1 level.

grandmother when the grandmother is alive and do not live close to her if the grandparent is not alive. Always takers and defiers do not exist in our setting. Therefore, LATE equals the average treatment effect on the treated (ATT). Another important comparison we have to make is between the LATE and the average treatment effect (ATE) for the population. However, this requires us to understand how compliers' characteristics differ from the characteristics of the overall population.[20]

2.5. Results

2.5.1. Main Results

We estimate equation (2.1) separately for each definition of proximity variable, 'District,' 'Town,' and 'City,' and present the results in Table 2.2. In columns (1) and (3), we present ordinary least squares estimation results where the outcome variables are labor force participation and employment, respectively. These results show that when proximity is defined as 'City,' the longest distance definition, there is a positive and marginally significant association between proximity and the labor force participation rate and employment of married women with young children, and the size is around 2—3 ppt. However, the size of the association gets smaller and insignificant as the proximity variable indicates a shorter distance.

As we mentioned earlier, OLS results may be biased due to endogeneity and reverse causality problems; therefore, these estimates may not provide any causal relationship. In order to get the causal effect of grandmothers' geographical proximity on the mother's labor market outcome, we use the number of alive

[20] In Chapter 3, we present the characteristics of compliers and the overall population. Then, we discuss the relationship between LATE and ATE.

grandmothers, 0, 1, or 2, as an instrument for their geographical proximity. In Table 2.3, we present the first-stage results. As Table 2.3 shows, the number of alive grandmothers is a strong predictor of grandparents' proximity for each of its definitions. F-statistics are far larger than the acceptable threshold of ten (Staiger & Stock 1997), which assures us that our instrument is strongly correlated with the endogenous variable, grandmothers' geographical proximity. While our first-stage F-statistic exceeds the threshold recommended by Staiger & Stock (1997), recent work by Lee et al. (2022) and Keane & Neal (2023) suggests that caution should be exercised when interpreting the significance and inference of the endogenous variable. Specifically, Lee et al. (2022) recommend a first-stage F-statistic threshold of 104.7. To address this concern, we conduct additional checks on the sensitivity of the second-stage results using the Anderson-Rubin (AR) test (Keane & Neal 2023) and the tF-procedure described in Lee et al. (2022). These tests are conducted in a just-identified setting with one endogenous regressor.

Table 2.2: Effects of grandmothers' proximity on mothers' labor market outcomes

	Dependent Variables			
	LFP		**Employment**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.001	0.182**	0.004	0.164**
	(0.013)	(0.080)	(0.013)	(0.079)
AR confidence set (95%)		*[0.032, 0.343]*		*[0.016, 0.324]*
tF confidence interval		*[0.024, 0.339]*		*[0.008, 0.320]*
F statistic:		121.126		121.126
Same town or closer				
Proximity	0.026**	0.136**	0.020	0.123**
	(0.013)	(0.060)	(0.013)	(0.060)
AR confidence set (95%)		*[0.024, 0.257]*		*[0.012, 0.243]*
tF confidence interval		*[0.018, 0.254]*		*[0.006, 0.239]*
F statistic:		186.531		186.531
Same city or closer				
Proximity	0.030*	0.132**	0.030*	0.119**
	(0.015)	(0.059)	(0.016)	(0.058)
AR confidence set (95%)		*[0.023, 0.251]*		*[0.011, 0.236]*
tF confidence interval		*[0.017, 0.247]*		*[0.005, 0.233]*
F statistic:		213.617		213.617
Observations		3,542		

Notes: $^*p<0.1$ $^{**}p<0.05$ $^{***}p<0.01$. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean LFP and Employment is 0.250 (0.433) and 0.237 (0.426). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least one child aged 0–5, whether there is an older sibling, and the number of young children in the household. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. In columns 2, 4, and 6, the number of alive grandmothers used as an instrument. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table 2.3: First-stage estimation results

	Dependent variable: *Grandparent's proximity*		
	District	Town	City
Number of grandmothers alive	0.168***	0.225***	0.232***
	(0.015)	(0.016)	(0.016)
Primary education	-0.018	-0.024	-0.014
	(0.026)	(0.025)	(0.021)
Secondary education	-0.015	-0.020	-0.006
	(0.026)	(0.024)	(0.020)
Tertiary education	-0.033	-0.006	-0.037
	(0.029)	(0.030)	(0.028)
Primary education (husband)	-0.002	0.012	0.016
	(0.025)	(0.021)	(0.018)
Secondary education (husband)	-0.078***	-0.047**	-0.012
	(0.023)	(0.021)	(0.016)
Tertiary education (husband)	-0.223***	-0.264***	-0.198***
	(0.028)	(0.026)	(0.025)
Employment (husband)	-0.104***	-0.033	-0.035*
	(0.028)	(0.025)	(0.021)
Town center	-0.007	-0.042**	-0.014
	(0.020)	(0.019)	(0.016)
Village	0.095***	-0.042**	-0.003
	(0.021)	(0.020)	(0.017)
Chronic illness	-0.001	0.012	0.015
	(0.020)	(0.020)	(0.016)
At least one child aged 0–5	-0.018	0.012	0.025
	(0.020)	(0.019)	(0.016)
At least one child aged 15 and above	0.039	-0.002	-0.013
	(0.024)	(0.023)	(0.020)
Number of young children	0.028**	0.003	0.005
	(0.013)	(0.011)	(0.010)
Observations	3,542	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least one child aged 0–5, whether there is an older sibling, and the number of young children in the household. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. The independent variable is the number of alive grandmothers. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10. Age fixed effects, the current region of residence (NUTS-1 level) and the childhood region (NUTS-2 level) fixed effects are not presented for space considerations.

We present the IV results in the second and fourth columns of Table 2.2.[21] These results suggest that grandmothers' proximity has a positive and significant causal impact on mothers' labor market outcomes. It increases the labor force participation and employment rates of mothers with young children by 18.2 ppt and 16.4 ppt, respectively, if the mother or in-law resides in the same neighborhood/district/village or closer. The effect diminishes as the distance from grandmothers increases. Our estimates are statistically significant even in the presence of weak instruments.[22] According to these results, OLS estimates seem to underestimate the impact of grandmothers' geographical proximity on women's labor force participation and employment.

We also present the reduced-form effect of the number of alive grandmothers on the labor force participation and employment probabilities of women with young children in Table A.2. These estimates imply that women whose mother or in-law is alive are around 3 ppt more likely to participate in the labor market and be employed. The estimate increases to 6 ppt if both of the grandmothers are alive. These results are slightly lower than the findings of Khanna & Pandey (2021) and Marcos (2023) who focus on co-residing mothers and grandmothers. Here, as our focus is on all mothers and grandmothers, a smaller effect is expected.[23]

We also investigate whether proximity to own mother or mother-in-law have similar effects on mothers' labor market outcomes. Table A.10 presents these results. In the first two columns, we present the results regarding the effects of own mothers' proximity, and in the third and fourth columns, we present the results

[21] In Tables A.8 and A.9, we present the coefficients of other control variables for labor force participation and employment, respectively.

[22] For all the single-instrument IV models estimated in the chapter with significant coefficients, we present the 95% and 90% tF confidence intervals unless the first-stage F-statistic reaches around 104.7. We also report AR confidence intervals, independent of the size of the first-stage F-statistic. The same is true of the other IV results presented in the chapter.

[23] We cannot analyze the sample of co-residing mothers or mothers-in-law as they constitute only 10% of our sample.

regarding the effects of mothers-in-law's proximity on labor market outcomes of women with young children. We find a relatively strong effect for the group of mothers living close to their own mothers. This might be because mothers are more likely to receive childcare transfers from their mothers than from mothers-in-law, or their own mothers might be less likely to impose restrictive norms.

We primarily focus on maternal labor market outcomes; grandparents also play varied roles in their grandchildren's lives. When children are raised by their grandmothers, it exerts discernible influences on children's psychological and physical well-being. They might shape children's dietary health and eating behaviors or promote a safe environment. Besides, children raised by grandmothers might exhibit a specific pattern of behavioral challenges, including anxiety, depression, and social challenges.[24] Before proceeding to the heterogeneity of our results, we investigate the effect of grandmothers' proximity on the general health status of children. The data set we use in this chapter (TFSS) includes a question that extracts information about the general health status of all children in the household. The possible answers include very good, good, neither good nor bad, bad, and very bad. We define the dependent variable as the general health status of the youngest child in the household that is equal to one if his/her health status is, in general, very good.[25] We use our main regression specification to examine the effects of grandmothers' proximity on the general health of the youngest and oldest child in the household. Table A.11 shows that the impact of grandparents' proximity on the general health status of either the youngest or oldest children is insignificant and very close to zero. Therefore, grandmothers' proximity does not seem to have any effect on the health of children.

[24] See Pulgaron et al. (2016) and Sadruddin et al. (2019) for a discussion of grandparents' health effects on their grandchildren.

[25] As 96% of children are reported to have good or very good health, we chose to define the dependent variable as having very good health.

2.5.2. Is it the Grandmothers' Proximity or Availability?

In the previous section, we show that grandmothers' proximity improves labor market outcomes of women with young children. However, one may argue that our results capture the grandmothers' availability rather than proximity. We check this hypothesis by computing sample-split estimates.[26] We construct three different samples. In the first sample, we only keep individuals whose mothers and/or mothers-in-law are living in the same district or a different city. In the second sample, we keep individuals whose mothers and/or mothers-in-law are living in the same town or different city (i.e., we dropped individuals living in the same district and same city with their mother or mothers-in-law). Finally, in the third sample, we keep individuals whose mothers and/or mothers-in-law are living in the same city or a different city. We illustrate which groups are included in each sample in the following table.

	Treatment Group			**Control Group**
	Same District	Same Town	Same City	Another City
Sample 1	X			X
Sample 2		X		X
Sample 3			X	X

Our proximity variable equals one if the mother or mother-in-law live in the same district (town, city), and zero otherwise. In each case, our control group is the same, those living in different cities than their mother and/or mother-in-law. The results for these samples are presented in different panels of Table A.12. The first panel shows that those women who live in the same district as their mothers and/or mothers-in-law, compared to those living in a different city, are significantly more likely to be in the labor force or employed. On the other hand, for the women whose mothers or mothers-in-law live in the same town but in a different district

[26] We would like to thank an anonymous referee for suggesting this analysis.

(same city but different town), the coefficients are insignificant and relatively small. If grandmothers being available (i.e., alive) or not available (i.e., not alive) drive our results, rather than their proximity, we would observe coefficients in the same magnitude across different samples. Therefore, we argue that proximity to grandmothers drives our results.

2.6. Heterogeneity of Results

Having established the causal relationship between grandmothers' geographical proximity and mothers' labor market outcomes, we would like to investigate the heterogeneity of our results. We first divide our sample according to the type of childhood region, village or non-village. We expect to find that women who grew up in village areas differ from those who grew up in city or town centers in terms of background characteristics, such as their mother's working status or the culture they were exposed to during their childhood. Table 2.4 shows that proximity to mothers or mothers-in-law has a positive impact on the labor force participation and employment of married women with young children who have grown up in a city or town center.[27] However, the effect is considerably smaller and insignificant for those who have grown up in a village. We attribute this difference to the variation in traditional gender norms mothers have been exposed to if their mothers or mothers-in-law live in close proximity.

Second, we divide our sample into two categories by the presence and age of the youngest child in the household: mothers with a child aged 0 to 5 (i.e., a preschool-aged child) and those with a school-age child, aged 6 to 10. One may expect to find that the childcare impact declines as the child ages; on the other

[27] The p-value of the test for significance of the proximity variable 'District' is 0.11 for the outcome variable 'Employment.' The p-values are 0.12 for other definitions of the proximity variable.

hand, the gender norm cost associated with working for mothers of children aged 0 to 5 might be higher.[28] The results presented in Table 2.4 show that the effect of grandmothers' availability on the labor supply and employment of mothers with children aged 0 to 5 is smaller in size relative to mothers with older children. This might be because school-age children need less intensive childcare, which increases the likelihood of getting grandmothers' help.

Table 2.4: Effects of grandmothers' proximity on mothers' labor force force participation and employment status for different subgroups

Subgroups:	*Dependent Variables*					
Childhood region type: City or town center						
	LFP			**Employment**		
	District	Town	City	District	Town	City
	0.228**	0.159**	0.162**	0.178	0.124	0.127
	(0.112)	(0.078)	(0.081)	(0.113)	(0.079)	(0.081)
F statistic:	64.947	108.175	107.548	64.947	108.175	107.548
AR confidence set (95%)	*[0.020, 0.463]*	*[0.013, 0.323]*	*[0.012, 0.332]*			
tf confidence interval	*[-0.002, 0.459]*					
Mean dependent variable		0.289			0.276	
		(0.453)			(0.447)	
Observations			2,380			
Childhood region type: Village						
	District	Town	City	District	Town	City
	0.110	0.083	0.083	0.134	0.101	0.101
	(0.111)	(0.084)	(0.083)	(0.108)	(0.081)	(0.080)
F statistic:	49.583	94.528	114.823	49.583	94.528	114.823
Mean dependent variable		0.170			0.158	
		(0.375)			(0.365)	
Observations			1,162			
Age of the youngest children: 0–5						
	District	Town	City	District	Town	City
	0.146*	0.116*	0.132*	0.139	0.110	0.125
	(0.087)	(0.068)	(0.079)	(0.086)	(0.068)	(0.078)
F statistic:	68.101	97.917	82.679	68.101	97.917	82.679
AR confidence set (95%)	*[-0.015, 0.328]*	*[-0.017,0.253]*	*[-0.015, 0.297]*			
AR confidence set (90%)	*[0.011, 0.293]*	*[0.005, 0.231]*	*[0.009, 0.270]*			
tf confidence interval	*[-0.031, 0.323]*	*[-0.018, 0.250]*	*[-0.026, 0.289]*			
Mean dependent variable		0.221			0.209	
		(0.415)			(0.407)	
Observations			2,345			
Age of the youngest children: 6–10						
	District	Town	City	District	Town	City
	0.228	0.156	0.129	0.187	0.128	0.106
	(0.147)	(0.099)	(0.082)	(0.143)	(0.096)	(0.079)
F statistic:	45.169	87.755	145.847	45.169	87.755	145.847
Mean dependent variable		0.307			0.292	
		(0.461)			(0.455)	
Observations			1,197			

Third, we investigate the impact of grandmothers' proximity according to the educational attainment of mothers. We divide our sample into two groups: mothers

[28]Reflecting these views, in 2015, the Minister of Health at the time was quoted saying that "Mothers should not put any career other than motherhood at the center of their career." (Akyol & Ökten 2022).

Table 2.4 (cont'd)

Subgroups:	*Dependent Variables*					
Educational Level:	**LFP**			**Employment**		
Secondary school or less	District	Town	City	District	Town	City
	0.207***	0.162***	0.158***	0.181**	0.142**	0.138**
	(0.075)	(0.059)	(0.057)	(0.073)	(0.057)	(0.056)
F statistic:	125.774	188.162	223.951	125.774	188.162	223.951
AR confidence set (95%)	*[0.066, 0.365]*	*[0.053, 0.280]*	*[0.052, 0.273]*	*[0.044, 0.335]*	*[0.035, 0.258]*	*[0.035, 0.251]*
Mean dependent variable		0.165			0.154	
		(0.371)			(0.361)	
Observations			2,936			
Educational Level:						
College or above	District	Town	City	District	Town	City
	–	-0.101	-0.091	–	-0.078	-0.070
		(0.216)	(0.193)		(0.228)	(0.204)
F statistic:	2.249	15.538	19.807	2.249	15.538	19.807
Mean dependent variable		0.662			0.642	
		(0.474)			(0.480)	
Observations			606			
Ownership status of the house:						
Owner	District	Town	City	District	Town	City
	0.099	0.071	0.070	0.065	0.047	0.046
	(0.108)	(0.077)	(0.077)	(0.107)	(0.077)	(0.076)
F statistic:	41.993	59.308	75.185	41.993	59.308	75.185
Mean dependent variable		0.257			0.246	
		(0.437)			(0.431)	
Observations			1,725			
Ownership status of the house:						
Not owner	District	Town	City	District	Town	City
	0.326**	0.244**	0.225**	0.315**	0.235**	0.217**
	(0.139)	(0.104)	(0.097)	(0.136)	(0.102)	(0.094)
F statistic:	41.993	59.308	75.185	41.993	59.308	75.185
AR confidence set (95%)	*[0.068, 0.628]*	*[0.050, 0.470]*	*[0.045, 0.428]*	*[0.062, 0.610]*	*[0.046, 0.456]*	*[0.042, 0.415]*
tf confidence interval	*[0.023, 0.630]*	*[0.028, 0.459]*	*[0.030, 0.420]*	*[0.018, 0.611]*	*[0.024, 0.446]*	*[0.027, 0.407]*
Mean dependent variable		0.243			0.229	
		(0.429)			(0.421)	
Observations			1,817			
Traditionality index:						
Non-conservative	District	Town	City	District	Town	City
	0.229*	0.158*	0.156*	0.197	0.136	0.134
	(0.132)	(0.092)	(0.091)	(0.131)	(0.091)	(0.090)
F statistic :	54.564	88.708	94.026	54.564	88.708	94.026
AR confidence set (95%)	*[-0.018, 0.517]*	*[-0.013, 0.352]*	*[-0.013, 0.347]*			
AR confidence set (90%)	*[0.022, 0.462]*	*[0.014, 0.321]*	*[0.014, 0.316]*			
tf confidence interval	*[-0.050, 0,507]*	*[-0.025, 0.341]*	*[-0.024, 0.335]*			
Mean dependent variable		0.295			0.282	
		(0.456)			(0.450)	
Observations			2,187			
Traditionality Index:						
Conservative	District	Town	City	District	Town	City
	0.129	0.102	0.099	0.123	0.097	0.094
	(0.096)	(0.076)	(0.073)	(0.094)	(0.075)	(0.072)
F statistic:	72.384	110.916	145.524	72.384	110.916	145.524
Mean dependent variable		0.177			0.166	
		(0.382)			(0.372)	
Observations			1,355			

who have (at most) secondary education degrees and those who have at least a college degree. In the previous section, we could not find differential effects of grandmothers' proximity on mothers' traditionality measures by education levels. However, as discussed in Section 2.2, if grandmothers' proximity only affects mothers' labor market outcomes through the childcare transfer, we expect the childcare channel to be stronger for women with lower education levels as free childcare would result in a greater percentage increase in the reservation wage.[29] Therefore, considering these two channels, we expect to find a larger effect for women with lower education. As we expected, Table 2.4 shows that the effect of grandmothers' proximity on labor force participation is pronounced only for women with, at most, secondary education degrees.

We also report the estimated effects of grandmothers' geographical proximity for two different groups, categorized based on the ownership status of the residences where families reside. The first category pertains to individuals who are the 'owner' of the residence, and the second group consists of tenants, lodgers, or those living in lodging, or those who are not the owner of the house but also not paying rent. We see that the effect of proximity is smaller in magnitude and not significant for mothers residing in their own homes, unlike the second category of women who are probably in a lower income group or feel less constrained about switching their residences and prefer to stay close to their mothers or in-laws.

Finally, we check the heterogeneity of the results according to women's traditionality index. We define women with a traditionality index above the median as 'conservative,' and women with a traditionality index equal to or below the median as 'non-conservative.' The results presented in Table 2.4 show that the estimates are larger and significant for the sample of non-conservative women.

[29] In Turkey, less educated women work under unfavorable conditions (Uraz et al. 2010).

These results highlight the importance of traditional gender norms.

We also repeat our heterogeneity analysis using the total sample instead of focusing on different samples by running a regression on the interaction of the group dummy and proximity variable. We present these results in Table A.13. Although the estimates of the interaction terms are less precisely estimated, they are large and in line with the results, as we presented in this section.

2.7. Robustness Checks

In this section, we present several analyses to test the robustness of our results.

2.7.1. Violation of the Exclusion Restriction

As the chapter's main results hinge on the instrument's validity, we test the robustness of our results to violations of the exclusion restriction assumption by using the imperfect instrumental variable (IIV) method proposed by Nevo & Rosen (2012) and the plausible exogeneity test by Conley et al. (2012). We present the details of the implementation of these methods in Online Appendix B. By using the IIV method by Nevo & Rosen (2012), we show that, for all proximity definitions, the IV estimates are located in the confidence intervals generated under the assumption that the instrument is less correlated with the error term than the original endogenous variable. Therefore, our results are robust to violations of the exclusion restriction.

We also apply the plausibly exogenous technique by Conley et al. (2012) to show how large a potential direct effect of the instrument can be to turn the 2SLS estimate of labor force participation and employment outcomes insignificant. We find that our results on labor market outcomes are significant as long as some omitted variable, which is also captured by the number of alive grandmothers, explains less than a quarter of the overall reduced form effect, which we argue is a large enough direct effect to ensure the robustness of our main results.

2.7.2. Violation of the Exogeneity Assumption

In our main analysis, we use the number of alive grandmothers as an instrument for the proximity of grandmothers while examining the labor market outcomes of mothers. However, if the labor market outcomes of mothers have any effect on the later deaths of grandmothers, our instrument would violate the exogeneity assumption. In this subsection, we utilize an alternative dataset, specifically the Turkish Income and Living Conditions Survey Micro data set (SILC), spanning the years 2012–2015, 2013–2016, 2014–2017, and 2015–2018, to investigate whether female labor force participation (FLFP) relates to the subsequent deaths of grandmothers.

The SILC dataset comprises four separate sets of data, including observations spanning two, three, and four years to assess individuals' living standards. This dataset includes information from various sources: i) Household register form, ii) Personal register form, iii) Household and personal follow-up form, iv) Household questionnaire, and v) Personal questionnaire.

Specifically, we construct a dataset within SILC, focusing on married women aged 18–50 who reside with either their mothers or mothers-in-law and have at least one child aged 0–10, as we only observe information about the respondent's mother or mother-in-law if they share the same household. After excluding observations with missing values for the variables used in our analysis, the sample size is reduced to 3,558 respondents.

To assess the relationship between FLFP and the subsequent deaths of grandmothers, we create two indicator variables: i) whether the respondent is currently active in the labor market, and ii) whether her co-residing mother or mother-in-law passes away in the following year.

We then employ a simple Ordinary Least Squares (OLS) regression, controlling for various factors, including age fixed effects, education categories for both spouses (primary education, secondary education, tertiary education, and less than primary education as the baseline category), the employment status of the spouse, and the presence of a chronic illness in either the respondent or her spouse.[30] We also cluster the standard errors at age level to account for potential correlations within age groups.

The results of our analysis are presented in Table A.14, and they indicate no observed relationship between current labor force participation and the subsequent death of grandmothers. It is also important to note that the coefficient presented in Table A.14 should be interpreted as an upper bound. This is because our analysis focuses on instances where the mother or mother-in-law passed away in the year following the observation, rather than considering the previous years when they were still alive.

2.7.3. Placebo Exercise

In this subsection, we conduct a placebo exercise, following Alsan (2015), to explore the differential effect of grandmothers' availability on subgroups of women

[30] The information on the region of residence, type of childhood settlement, or childhood region (NUTS-2 level) is not available.

with at least a college degree. This choice is motivated by the anticipation that better-educated couples tend to live farther from their parents due to greater variability in earning opportunities and the ability to be selective in job choices, leading to exploration across broader geographical regions (Chan & Ermisch 2015, Amior 2019). Additionally, if adult children with a college education achieve greater success in terms of employment and earnings, time transfers from mothers may be less crucial to them (Compton & Pollak 2015). Therefore, we argue that the availability of grandmothers is less likely to affect the labor market outcomes of mothers with at least a college education through geographical proximity. As a result, the differential effects of the instrument on the labor market outcomes of women with at least a college education capture other potential channels that the instrument may affect, if they exist. We use our original sample and regress labor market outcomes on our instrument –the number of grandmothers alive– and its interaction with a dummy variable indicating less than college-educated mothers. We also include the interaction of this dummy with the covariates in our baseline model. Results are presented in Table A.15. The first column shows the effect of the instrument on labor market outcomes for at least college-educated mothers. The estimate is both insignificant and has a negative sign. The second column of Table A.15 represents the differential effect of the instrument on mothers with less than a college education. Finally, the third column presents the overall effect of the instrument on less-than-college-educated mothers, revealing a significant and positive effect. Overall, these results provide evidence that our instrument does not affect mothers' labor market outcomes through a channel other than proximity.

2.7.4. Alternative Specifications and Samples

In this section, we present additional analysis to check the robustness of our results to alternative specifications and samples. First, we check the robustness of our results by dropping the potentially endogenous variables from our analysis. Particularly, we drop the following variables: i) whether there is at least one child aged 0 to 5, ii) whether there is an older sibling, and iii) the number of young children in the household. We present the results in Table A.16. While the coefficients are slightly smaller in magnitude, our results are robust to the exclusion of the potentially endogenous variables listed above.

Second, we changed our estimation sample by focusing on mothers with children aged 0 to 9 and 0 to 11 to show that our results are robust to the age cutoff. As Table A.17 shows, the effect of proximity is positive and significant across different cut-off age levels.[31,32]

One may argue that the reason why mothers are staying out of the labor market might be their poor health conditions. In that case, they may prefer to stay close to their grandmothers to share the burden of housework or childcare activities, leading to a downward bias in our IV estimates. Therefore, we restrict our sample to mothers without chronic illnesses. Table A.17 shows that, as expected, the coefficients increase slightly relative to the baseline results, and they are all significant.

We further check the robustness of our results by changing the definition of the instrumented and instrumental variables. In the first analysis, we change the

[31] For the subsample of mothers with children aged 0 to 9, for the outcome variable of employment, the p-value of the test for significance of each proximity variable is 0.11.

[32] The estimates for the key variable of interest in the main sample and the subsample of mothers with children aged 0 to 9 are not statistically different.

proximity variable definition to the number of grandmothers within a close distance, while keeping the instrumental variable the same as in the baseline regression (i.e., the number of grandmothers alive). The estimated coefficient and Wald F-statistics are reported in Table A.18. The results show that having either grandmother a short distance away increases the mother's labor force participation and employment probability by 4–12 ppt, almost half of our baseline estimates. In the second analysis, we keep the proximity variable as in the baseline model (i.e., equal to one if at least one grandmother lives close), but we use two different instruments for the proximity variable. We define two different instruments by using the information on whether maternal and paternal grandmothers are alive. The results of this specification are also consistent with our main findings. Having multiple instruments for a single endogenous variable allows one to perform an over-identification test. The joint null hypothesis that the instruments are valid and that the excluded instruments are correctly excluded from the estimated equation is not rejected by Hansen J statistics. In the final analysis, we define proximity as the number of grandmothers in close distance and specify two instruments indicating whether maternal and paternal grandmothers are alive. That is, proximity is defined as in Analysis 1, and the instruments are defined as in Analysis 2. The estimated effects from this specification remain similar to those obtained in the previous analysis, showing that our results are robust to different specifications.

2.7.5. Sample Selection

Another important concern is that women living close to grandmothers might affect women's fertility behavior, resulting in selection into our main analysis sample, which would bias our results. To see if our findings are influenced by sample selection bias, we focus on the sample of all married women and estimate the effects of proximity on having at least one young child (aged 0 to 10). The results presented in the first column of Table A.19 show that the grandmothers' proximity does not significantly affect having at least one young child. We also investigate the effects of grandmothers' proximity on the number of young children in our main estimation sample, married women aged 18 to 50 with at least one young child. The results presented in the second column of Table A.19 show that grandmothers' proximity has no significant effect on the number of young children. Therefore, we can conclude that our results are less likely to suffer from sample selection bias.

2.8. Conclusion

Female labor force participation is an essential driver of women's well-being and the well-being of the economy they live in, yet, in many countries, it remains at low levels. There are several factors, such as access to childcare, education level, and cultural and gender norms, that can affect women's labor supply decisions. In this chapter, we investigate how geographical proximity to grandmothers affects labor supply decisions of women with young children using the Turkish Family Structure Survey data set. We use an instrumental variable approach to address the potential endogeneity that arises if the labor force participation decision of women determines grandmothers' choice of residence or vice versa, and if unobserved family characteristics affect women's decision to work.

We find that living in the same neighborhood or closer to a mother or mother-in-law increases women's labor force participation and employment rate by 18.2 ppt and 16.4 ppt, respectively. We also show that when we extend proximity measures to the same town or closer, and the same city or closer, the effects are reduced to 13.6 ppt and 12.3 ppt for labor force participation, respectively, and reduced to 13.2 ppt and 11.9 ppt for employment outcomes, respectively. We investigate three potential channels –childcare, elderly care, and traditional gender norms channels– that can link grandmothers' proximity to mothers' labor market outcomes.

Our heterogeneity results reveal that our main results are driven by women with, at most, secondary education, and the results are stronger for women who have been raised in non-village areas. Our results suggest that geographical proximity have the potential to increase the labor force participation of women who are at risk of withdrawing from the labor market.

CHAPTER 3

EEFECTS OF GRANDMOTHERS PROXIMITY ON MOTHERS LABOR FORCE PARTICIPATION: RELEVANT CHANNELS

3.1. Introduction

In the exploration of how grandmothers' proximity influences mothers' labor force participation, understanding the possible mechanisms is crucial. In this chapter, we examine these mechanisms, analyzing how the presence of grandmothers impacts mothers' labor market decisions. Grandmothers' proximity affects female labor market participation through three channels. The first channel is the possible help of grandmothers in childcare activities. The literature shows that increased childcare costs hinder women's active participation in the workforce (Heckman 1974, Blau & Robins 1988, Klerman & Leibowitz 1990, Connelly 1992, Ribar 1992, Kimmel 1998). Essentially, the presence of young children in the household increases the reservation wage of women, thereby decreasing their labor supply (Leibowitz & Klerman 1995).[1] Therefore, the availability of grandparents in a geographically close distance who can provide free and flexible childcare can be a

[1] In addition, after the birth of a first child, women may experience a large drop in their earnings (Kleven et al. 2019).

factor that can increase female labor force participation by reducing women's reservation wages. On the other hand, intergenerational transfers may also operate the other way around. Care duties to grandmothers in need of care may discourage women's labor market participation (Ettner 1996, Kolodinsky & Shirey 2000, Pagani & Marenzi 2008, Maurer-Fazio et al. 2011). The third channel we consider is the traditional gender norm channel. Grandmothers living at a close distance can better monitor women's behavior and impose traditional gender roles on women with children. Several studies document the link between women's labor market outcomes and gender norms (Fernández et al. 2004; the survey by Bertrand 2011; Olivetti et al. 2020). Given the prevailing gender norms against women's employment in Turkey,[2] grandmothers in close geographical proximity might reduce the labor market participation rates of married women with young children. Therefore, the effects of grandmothers' proximity on female labor market participation depend on the size of these opposing factors.[3]

To disentangle the effect of grandparental proximity, we first investigate the causal channels through which proximity affects the labor market outcomes of married women with young children, utilizing the conceptual framework outlined in the previous chapter. To check whether grandmothers' childcare provision drives our results, we extend our analysis to include women without young children and men with young children whose decisions of work do not depend on any childcare transfer (İlkkaracan 2010). Applying our methodology to these groups (see Section 2.4), we find that the estimates are insignificant and relatively small in terms of

[2] According to the 2018 World Value Survey, in Turkey, 50% of women and 53% of men state that they agree or strongly agree with the statement that "When a mother works for pay, the children suffer." In addition, according to a survey conducted in a representative sample of adults by the Konda, Research and Consulting company in 2015, 63% of women and 71% of men state that they agree or strongly agree with the statement that "The main responsibility of the woman is to raise children and run a household."

[3] In a similar setting in India, Khanna & Pandey (2021) investigate the role of the co-residing mother-in-law on the daughter-in-law's labor market participation.

size. We further show that the proximity of grandfathers, who typically bear less responsibility in childcare activities, is not a determinant of mothers' labor force participation or employment.

Our data allows us to investigate the two other channels that can link grandmothers' proximity and mothers' labor market outcomes, namely the traditional gender norm and the elderly care channels. We investigate the effects of grandmothers' proximity on four traditionality and religiosity variables.[4] Our results suggest that grandmothers' proximity does not have a significant effect on traditionality variables for the total sample.[5] However, the results differ substantially for the sample of women who have grown up in village vs. those in non-village areas. Grandmothers' proximity significantly increases mothers' traditionality and religiosity in the village sample, while the results are small and statistically insignificant for the non-village sample. We also do not find any differential effects of the mother's or mother-in-law's proximity on traditionality and religiosity variables.

We finally investigate whether grandmothers' proximity has any effects on mothers' labor market outcomes through the elderly care channel. Our results do not provide any evidence that the elderly care channel has the potential to affect our main results. These findings suggest that the results for labor market outcomes for the village sample reflect the net effect of childcare and traditionality.

The chapter, firstly, contributes to the broad literature that investigates the factors affecting female labor force participation, such as social norms, religiosity, culture (Akerlof & Kranton 2000; Fernandez 2007; Fernández & Fogli 2009; Dildar

[4] These variables are 'Having Son Preference,' 'Finding Women's Working Inappropriate,' 'Not Approving Interdenominational Marriage,' and 'Traditionality Index,' which is the first principal component of all the variables used to construct the three traditionality and religiosity variables.

[5] The only exception is the significant positive effect observed for 'Not Approving Interdenominational Marriage.'

2015; Akyol & Ökten 2022), fertility and motherhood (Angrist & Evans 1998; Aguero & Marks 2008; Cristia 2008; Lundborg et al. 2017 and Kleven et al. 2019), and availability and cost of childcare (Baum 2002; Berlinski & Galiani 2007; Tekin 2007; Fitzpatrick 2010; Berlinski et al. 2011; Brilli et al. 2016; Morrissey 2017; Müller & Wrohlich 2020). We complement this literature by providing evidence that the proximity of the grandmothers can increase women's labor force participation through their childcare provision or impede their labor force participation by imposing prevalent unequal gender norms on women.

This chapter also contributes to the literature that investigates the effect of grandparental childcare on maternal labor force participation. The evidence in the literature shows that having grandparents help with childcare encourages mothers to join the labor market (see Posadas & Vidal-Fernández (2013), Arpino et al. (2014), Bratti et al. (2018), Aparicio-Fenoll & Vidal-Fernandez (2015), Zamarro (2020)).[6,7] Dimova & Wolff (2011) show that frequent childcare provided by maternal grandmothers is positively associated with young mothers' employment probability in ten European countries.[8] Aassve et al. (2012) point out that these results may differ according to the intra-household dynamics in the corresponding country. They find that receiving childcare help from grandparents has a positive and significant impact on mothers' labor supply decisions in France, Germany, Bulgaria, and Hungary. However, in Georgia, Russia, and the Netherlands, no significant effect of informal childcare on mothers' work decisions is observed.

Our findings contribute to a better understanding of gender roles, labor market

[6] For a recent review of the literature on the effect of grandparental childcare on labor supply of women, see Zanella (2017).

[7] Battistin et al. (2014) show that delayed retirement induced by pension reforms decreases the number of hours devoted to childcare by grandparents and has a strong negative effect on their offspring's fertility.

[8] These countries are Austria, Germany, the Netherlands, Sweden, Spain, Italy, Denmark, France, Greece, and Switzerland.

outcomes, and intergenerational family transfers, extending beyond Turkey. They provide insights into challenges and opportunities for women in different cultural contexts where extended family networks play an important caregiving role.

The chapter is most closely related to Compton & Pollak (2014). As clearly explained by Compton & Pollak (2014), different from regular grandparental childcare, focusing on the effect of proximity will include the insurance aspect of childcare to meet irregular or unanticipated needs. The studies in the existing literature do not consider the insurance aspect of grandparents' availability for childcare. This aspect of proximity can be very important in the Turkish setting, as there is a lack of childcare services to satisfy working mothers' needs. On the other hand, having a grandmother (in-law) within a geographically close distance may negatively affect mothers' labor supply decisions, as prevalent gender norms in Turkey are hostile to women's labor market participation. It failed to consider the effect of proximity through the traditional gender norm channel, which we carefully examine and show that it is especially relevant for women raised in villages. These findings are informative from a policy perspective, as increasing public-provided childcare in rural settings may not improve female labor market outcomes. Therefore, more carefully designed policies that interact with traditional gender norms are needed.

The organization of the chapter is as follows: Section 3.2 describes the data and discusses the characteristics of compliers. Section 3.3 investigates the mechanisms through which the proximity of grandmothers affects mothers' labor market outcomes. Section 3.4 concludes the chapter.

3.2. Data

In this chapter, we use the 2016 Turkish Family Structure Survey (TFSS), which was conducted by the Turkish Statistical Institute and the Ministry of Family and Social Policies. The TFSS is collected to understand the changes in family structures and lifestyles in Turkey. The survey was conducted between June 1 to September 26, 2016 among 35,475 individuals in 17,239 households. It is representative at the NUTS-1 level and in three major provinces (İstanbul, İzmir, Ankara). The survey consists of Individual and Household questionnaires. The Individual questionnaires cover all individuals over 15 years old who live in a household and contain information on demographics, family structure, labor market outcomes, and a unique identifier that helps us match with their partners, if available. To examine the childcare provision channel, we construct labor force participation and employment variables for fathers with young children (children 10 years old or younger) in the same way we define them for mothers. We also construct grandfathers' proximity in the same way we construct the grandmothers' proximity.

We also construct four different outcome variables to measure levels of traditionality and religiosity: i) Son Preference, ii) Finding Women's Working Inappropriate, iii) Not Approving of Interdenominational Marriages, and iv) Traditionality Index. We use two survey questions to construct the 'Son Preference' variable. The survey respondents are asked whether they totally disagree, disagree, partially agree, agree, or strongly agree with the following statements: "A son makes a mother more respectable." and "Only a son can ensure the continuation of the family bloodline." If the respondent agrees or strongly agrees with any of these statements, the 'Son Preference' variable is coded as one, and zero otherwise.

Our second key variable, 'Finding Women's Working Inappropriate,' is constructed by using the survey question "Do you find women's working appropriate?" If the answer to this question is "No," we code it as one, and zero otherwise.

We also construct a 'Not Approving Interdenominational Marriages' variable by using the survey question that asks respondents whether they totally disagree, disagree, partially agree, agree, or strongly agree with the statement, "People from different religious sects can marry each other." We define it as one if the respondent disagrees or totally disagrees with the statement, and zero otherwise. Finally, we construct an index for conservatism, which is the first principal component of the four variables used for constructing the three traditionality and religiosity variables.

Table 3.1 reports the summary statistics by the proximity of the grandmothers' residence for each proximity definition. According to Table 3.1, mothers who live at a geographically close distance to their mothers or mothers-in-law are more likely to have more traditional gender views. These statistics highlight the fact that there is selection in these groups (i.e., residential location choice depends on the observed and unobserved characteristics of mothers). Therefore, we address the endogeneity problem in our empirical strategy using the IV strategy, employing IV estimation method by using the number of alive grandmothers as an instrument for proximity.

In Table B.1, we present descriptive statistics of key variables relevant to analyzing the mechanisms through which grandparental proximity affects mothers' labor market decisions. We present them by the number of available grandmothers, our instrument. mothers who live at a geographically close distance to their mothers or mothers-in-law are more likely to have younger children, are less likely to have older children and have more traditional gender views. Additionally, these mothers are more likely to reside in their own or their husbands' childhood regions. These statistics underscore the necessity for a refined analysis to understand the mechanisms behind the positive impact of grandparental proximity.

Table 3.1: Descriptive statistics by grandmothers' geographical proximity

	District		**Town**		**City**	
	Distant	Close	Distant	Close	Distant	Close
Labor force participation	0.273	0.209	0.265	0.242	0.269	0.245
	(0.446)	(0.407)	(0.441)	(0.428)	(0.444)	(0.430)
Employment	0.259	0.199	0.255	0.228	0.256	0.232
	(0.438)	(0.399)	(0.436)	(0.420)	(0.437)	(0.422)
Age	34.090	32.792	34.658	33.072	34.782	33.296
	(6.303)	(6.194)	(6.489)	(6.119)	(6.637)	(6.157)
Primary school or less	0.430	0.544	0.435	0.490	0.431	0.482
	(0.495)	(0.498)	(0.496)	(0.500)	(0.496)	(0.500)
Primary education	0.169	0.198	0.164	0.187	0.160	0.185
	(0.375)	(0.398)	(0.370)	(0.390)	(0.367)	(0.388)
Secondary education	0.190	0.159	0.180	0.178	0.165	0.183
	(0.392)	(0.366)	(0.384)	(0.383)	(0.371)	(0.386)
Tertiary education	0.212	0.100	0.221	0.145	0.244	0.151
	(0.409)	(0.299)	(0.415)	(0.352)	(0.430)	(0.358)
Primary school or less (husband)	0.309	0.426	0.312	0.372	0.314	0.362
	(0.462)	(0.495)	(0.464)	(0.484)	(0.465)	(0.481)
Primary education (husband)	0.140	0.203	0.124	0.183	0.116	0.176
	(0.347)	(0.402)	(0.329)	(0.387)	(0.32)	(0.381)
Secondary education (husband)	0.241	0.239	0.209	0.257	0.183	0.256
	(0.428)	(0.426)	(0.407)	(0.437)	(0.387)	(0.437)
Tertiary education (husband)	0.310	0.132	0.355	0.188	0.387	0.206
	(0.463)	(0.339)	(0.479)	(0.391)	(0.487)	(0.405)
Employed (husband)	0.932	0.886	0.927	0.909	0.932	0.910
	(0.252)	(0.318)	(0.260)	(0.288)	(0.251)	(0.286)
Childhood region: City center	0.398	0.318	0.348	0.380	0.355	0.373
	(0.490)	(0.466)	(0.477)	(0.486)	(0.479)	(0.484)
Childhood region: Town center	0.322	0.269	0.324	0.291	0.321	0.298
	(0.467)	(0.444)	(0.468)	(0.454)	(0.467)	(0.457)
Childhood region: Village	0.280	0.413	0.328	0.328	0.325	0.329
	(0.449)	(0.493)	(0.470)	(0.470)	(0.469)	(0.470)
Child aged 0–5 in the household	0.653	0.678	0.626	0.681	0.606	0.677
	(0.476)	(0.467)	(0.484)	(0.466)	(0.489)	(0.468)
Child aged 15 and above	0.216	0.210	0.244	0.198	0.257	0.202
	(0.412)	(0.407)	(0.430)	(0.399)	(0.437)	(0.402)
Number of young children	1.523	1.657	1.510	1.604	1.481	1.597
	(0.692)	(0.796)	(0.687)	(0.756)	(0.677)	(0.748)
Son preference	0.296	0.410	0.314	0.349	0.332	0.338
	(0.456)	(0.492)	(0.465)	(0.477)	(0.471)	(0.473)
Finding women's working inappropriate	0.082	0.088	0.081	0.086	0.083	0.084
	(0.274)	(0.283)	(0.273)	(0.280)	(0.276)	(0.278)
Interdenominational marriage is not allowed	0.490	0.554	0.502	0.520	0.506	0.516
	(0.500)	(0.497)	(0.500)	(0.500)	(0.500)	(0.500)
Traditionality index	0.420	0.541	0.434	0.480	0.456	0.466
	(0.453)	(0.501)	(0.452)	(0.485)	(0.476)	(0.474)
Lives in childhood region	0.628	0.814	0.474	0.812	0.308	0.803
	(0.484)	(0.389)	(0.500)	(0.391)	(0.462)	(0.398)
Husband childhood region	0.656	0.847	0.512	0.838	0.357	0.828
	(0.475)	(0.36)	(0.500)	(0.369)	(0.479)	(0.378)
Only one grandmother alive	0.221	0.152	0.247	0.169	0.248	0.181
	(0.415)	(0.359)	(0.432)	(0.375)	(0.432)	(0.385)
Both grandmothers alive	0.738	0.848	0.677	0.831	0.632	0.819
	(0.440)	(0.359)	(0.468)	(0.375)	(0.482)	(0.385)
Only one grandfather alive	0.324	0.341	0.337	0.327	0.345	0.326
	(0.468)	(0.474)	(0.473)	(0.469)	(0.476)	(0.469)
Both grandfathers alive	0.576	0.559	0.543	0.584	0.522	0.583
	(0.494)	(0.497)	(0.498)	(0.493)	(0.500)	(0.493)
Observations	2,256	1,286	1,221	2,321	770	2,772

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

3.2.1. Characteristics of Compliers

In this subsection, we examine whether the instrumental variable results can be generalized to the population by comparing the observable characteristics of compliers to the overall sample. Table B.2 presents the mean and variance of the covariates for the compliers, never-takers, and whole sample for each specification of the proximity variable.[9,10] Table B.2 shows that the estimated share of compliers is about 37%, whereas never-takers account for 63% of the sample if the proximity variable is defined as living in the same district or closer. Compared to the overall sample, the compliers are less likely to have a college education and more likely to have no schooling. Similarly, their partners are less educated. The complier group of women is more likely to have been raised in a village and adhere to traditional gender roles compared to the overall sample.

We also aim to examine whether the complier group mainly consists of women who have decided to live where they were born or where their partners were born. Table B.2 presents the descriptive statistics of two variables, 'woman/husband lives in the childhood region,' where the variables take the value of one if the woman/husband lives in the same childhood region, and zero otherwise. However, we have to note that although we have the information on the current name of the province where the woman/husband lived longest until the age of 15, we observe their current region of residence at the NUTS-1 level unless they live in three major provinces, İstanbul, Ankara, and İzmir.[11] The table shows that among compliers,

[9] We use the ivdesc package in STATA by Marbach & Hangartner (2020) to estimate the statistics.

[10] The method assumes that both the treatment variable and the instrument are binary. Therefore, we split the instrument indicator into two groups: women whose mother or mother-in-law is alive and those with neither of them available.

[11] Turkey has 12 NUTS-1 regions, 24 NUTS-2 subregions, and 81 NUTS-3 provinces. The NUTS-1 regions are İstanbul Region (TR1), West Marmara Region (TR2), Aegean Region (TR3), East Marmara Region (TR4), West Anatolia Region (TR5), Mediterranean Region (TR6), Central Anatolia Region (TR7), West Black Sea Region (TR8), East Black Sea Region (TR9), Northeast Anatolia Region (TRA), Central East Anatolia Region (TRB), and Southeast Anatolia Region (TRC).

almost 81.3% of women currently live in the NUTS-1 region where they lived longest until age 15. The average values presented here are interpreted as upper bound values since the respondent is considered not to have moved even if she switched to another city located within the same NUTS-1 region. Regarding their husbands' hometown, the sample mean is highest for women in the complier group.

Overall, mothers in the complier group are less educated, have less educated husbands, are more likely to have traditional gender views, and are more likely to live either in their home region or their husbands' home region. In addition, the share of women who moved to different regions from their parents or parents-in-law is higher in never-takers than in the complier group, implying that demand for grandparental support is lower among household movers.[12] These patterns, considering the channels through which proximity can affect mothers' labor supply, make it hard to compare the LATE and the average treatment effect (ATE). As the compliers group consists of women of low socioeconomic status, their reservation wage would be more sensitive to the cost of formal childcare, making them benefit more from free childcare. On the other hand, women in the compliers group are more likely to grow up in villages and be exposed to traditional gender attitudes, which may reduce their labor supply. Similarly, they are more likely to live in home regions, which may increase demand for their elderly care services, which is anticipated to decrease their labor supply further. Therefore, only if the childcare channel dominates traditional gender norms and elderly care channels, LATE would be larger than ATE.

[12] As an additional analysis to characterize the compliers, we divide the sample into different groups with respect to the basic characteristics and estimate our first-stage regression specification. Table B.3 presents these results. Each panel of Table B.3 presents the coefficients of the instrument in each subgroup for each proximity measure, a binary indicator taking a value of one for mothers and grandmothers living in the same district, town, or city, respectively. These patterns show that the LATE is based on less educated women with less educated husbands who hold traditional gender views and reside in their or their husband's home region.

In the next section, we investigate the mechanisms through which grandparents' proximity affect mothers' labor market outcomes.

3.3. Mechanisms

In the first chapter of the thesis, we show that the proximity of grandmothers has a positive causal effect on mothers' labor market outcomes. In this chapter, we investigate how three different mechanisms –childcare provision, traditional gender norms, and elderly care channels– which we discuss in the Conceptual Framework section, contribute to these results.

3.3.1. Childcare Provision Channel

We argue that the most important channel that links proximity and mothers' labor market outcomes is the grandmothers' free and flexible childcare provision. First, we examine whether the childcare provision channel drives our results by restricting our sample to married mothers with children older than ten and married women without any children. If grandmothers' proximity affects mothers' labor market outcomes through their childcare provision, the effect in this sample should be small or non-existent as the women's labor market participation decision in this sample does not depend on the availability of childcare. In the first two columns of Table 3.2 and Table 3.3, we present OLS and IV results where we use the number of grandmothers alive as an instrument for the grandmothers' proximity. Although the coefficients are positive when the proximity of grandmothers is instrumented, they are insignificant and much smaller relative to our main results in the previous chapter. (See Table 2.2)

Table 3.2: Effects of grandparents' proximity on labor force participation of women without young children, fathers, and mothers with young children

	Dependent Variable: Labor Force Participation					
	Women without young children		**Fathers with young children**		**Mothers with young children**	
	OLS	IV	OLS	IV	OLS	IV
Same neighborhood/district/village or closer						
Grandmother lives close	-0.010	0.075	-0.014***	-0.001		
	(0.019)	(0.059)	(0.005)	(0.029)		
F statistic:		321.186		137.925		
Same town or closer						
Grandmother lives close	-0.000	0.054	-0.012***	-0.001		
	(0.017)	(0.042)	(0.004)	(0.024)		
F statistic:		620.949		176.879		
Same city or closer						
Grandmother lives close	0.042**	0.050	-0.010***	-0.001		
	(0.019)	(0.039)	(0.004)	(0.024)		
F statistic:		812.586		182.870		
Same neighborhood/district/village or closer						
Grandfather lives close					-0.014	0.047
					(0.015)	(0.054)
F statistic:						333.590
Same town or closer						
Grandfather lives close					0.005	0.030
					(0.013)	(0.034)
F statistic:						764.301
Same city or closer						
Grandfather lives close					0.004	0.028
					(0.014)	(0.032)
F statistic:						942.015
Observations	2,509	2,509	3,408	3,408	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The dependent variables are women's labor force participation, fathers' labor force participation, and mothers' labor force participation, respectively. The mean value of the dependent variable is 0.322 (0.467), 0.984 (0.124), and 0.250 (0.433) for the group of married women without young children, fathers with young children, and mothers with young children, respectively. Control variables are the same as the baseline estimation. For the first four columns, the instrumented variable: Mother or in-law lives close; the instrumental variable: Number of grandmothers alive. For the fifth and sixth columns, the instrumented variable: Father or in-law lives close; the instrumental variable: Number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

Table 3.3: Effects of grandmothers' proximity on the employment status of women without young children, fathers, and mothers with young children

	Dependent Variable: Employment					
	Women without young children		**Fathers with young children**		**Mothers with young children**	
	OLS	IV	OLS	IV	OLS	IV
Same neighborhood/district/village or closer						
Grandmother lives close	-0.009	0.065	-0.022***	0.025		
	(0.019)	(0.058)	(0.009)	(0.053)		
F statistic:		321.186		137.925		
Same town or closer						
Grandmother lives close	0.000	0.046	-0.025***	0.021		
	(0.017)	(0.041)	(0.008)	(0.044)		
F statistic:		620.949		176.879		
Same city or closer						
Grandmother lives close	0.038**	0.043	-0.019**	0.021		
	(0.019)	(0.038)	(0.009)	(0.045)		
F statistic:		812.586		182.870		
Same neighborhood/district/village or closer						
Grandfather lives close					-0.012	0.048
					(0.014)	(0.054)
F statistic:						333.590
Same town or closer						
Grandfather lives close					-0.000	0.030
					(0.013)	(0.034)
F statistic:						764.301
Same city or closer						
Grandfather lives close					0.002	0.029
					(0.014)	(0.032)
F statistic:						942.015
Observations	2,509	2,509	3,408	3,408	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The dependent variables are women's employment, fathers' employment, and mothers' employment, respectively. The mean value of the dependent variable is 0.297 (0.457), 0.937 (0.243), and 0.237 (0.426) for the group of women without young children, fathers with young children, and mothers with young children, respectively. Control variables are the same as the baseline estimation. For the first four columns, the instrumented variable: Mother or in-law lives close; the instrumental variable: Number of grandmothers alive. For the fifth and sixth columns, the instrumented variable: Father or in-law lives close; the instrumental variable: Number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

We then investigate if our findings are driven by the childcare channel by repeating the same analysis with the sample of fathers with children ten years old or younger. Men are less likely to be involved in household or childcare activities in societies where the patriarchal structure dominates (as in Turkey). Thus, we expect that grandmothers' proximity would have either no effect or a smaller effect on fathers' labor force participation and employment probabilities. The OLS and IV results are presented in the third and fourth columns of Table 3.2 and Table 3.3 for labor force participation and employment, respectively. Our IV results confirm that grandmothers' geographical proximity does not affect either fathers' labor supply or employment probabilities. We also perform a reduced-form estimation for each of these samples (i.e., we estimate the direct effect of the number of grandmothers alive on the labor market outcomes of women without young children and fathers with young children). We present the results in Table B.4. These results show that the impact of the number of alive grandmothers on labor market outcomes is negligible and statistically insignificant for these samples.

Grandfathers are less engaged in childcare activities than grandmothers (Hank & Buber 2009); therefore, we expect very little or no impact of grandfathers' proximity on the labor market outcomes of mothers with young children. In the fifth and sixth columns of Tables 3.2 and 3.3, we focus on our main sample, mothers with young children, but use grandfathers' proximity as an endogenous variable and the number of alive grandfathers as an instrument. Our IV results indicate that grandfathers' childcare transfers do not significantly affect daughters' labor market outcomes.[13] For this sample, we also perform a reduced-form estimation to examine the direct impact of the number of alive grandfathers on the

[13] In our sample, 29% of grandfathers live in the same district, 56% live in the same town, and 69% live in the same city as their daughters (in-law). The correlation between the grandmothers' and grandfathers' proximity is 75% *(p<.001)* for the shortest proximity definition, and 71% *(p<.001)* and 68% *(p<.001)* for the medium and longest proximity definitions.

labor market outcomes of mothers with young children. The last two columns of Table B.4 present these results, showing that the number of alive grandfathers has literally no effect (the coefficients are around 0.009) on the labor market outcomes in this sample.

Finally, we define an additional outcome variable that is equal to one if a woman reports housework and childcare as the primary reason for not working, and zero for those in the labor force, seasonal workers, or those reporting that their reason for not working is something other than childcare and household chores. Almost 85% of married women with young children in the TFSS data set state that they are out of the labor market because they engage in housework activities. Therefore, we conduct the same analysis using this new variable to see if the reasons for not working change with the proximity of grandmothers for each group of women *with* and *without* young children in Table B.5. The IV results presented in Table B.5 show that for the sample of women with young children, the proximity of grandmothers decreases their probability of stating childcare as a reason for not working. The coefficients are negative for women without young children but are much smaller and insignificant. These falsification checks support our hypothesis that childcare availability links grandmothers' geographical proximity and mothers' labor market outcomes.

3.3.2. Traditional Gender Norms Channel

In this section, we examine the effects of grandmothers' proximity on mothers' traditionality and religiosity to understand whether it has any effects on our main results. We use four variables defined in the Data section. Namely, we use 'Having Son Preference,' 'Finding Women's Working Inappropriate,' 'Not Approving

Interdenominational Marriage,' and 'Traditionality Index.' The 'Traditionality Index' is constructed using all the variables employed in the creation of the traditionality and religiosity measures.[14]

In Table 3.4, we present the effects of grandmothers' proximity on these four variables for the total sample as well as for the sample of women who have grown up in villages and non-villages (city or town centers). We also report the p-values adjusted for multiple hypothesis testing using Simes (1986). The results for the total sample show that grandmothers' proximity does have a significant effect on traditionality variables except 'Not Approving Interdenominational Marriage.'

Table B.6 shows that women in our sample who grew up in village areas are more likely to hold traditional gender views compared to women raised in non-village areas. Therefore, we divide our sample according to the type of childhood region settlement to investigate heterogeneity in different samples. The results presented in columns (2) and (3) of Table 3.4 show that grandmothers' proximity increases the probability of having son preference, finding women's working inappropriate,[15] not approving interdenominational marriages, and the traditionality index for the sample of women who have grown up in villages. However, for the women who have been raised in city or town centers, the estimated coefficients are small and insignificant. Overall, the results presented in Table 3.4 show evidence that 'the traditional gender view channel' is an important factor for the women raised in villages. Therefore, we expect that the results for the labor outcomes of women who have grown up in a city or district would reflect grandmothers' childcare provision, while the results for the village subsample will be the net effect of the childcare provision and traditional gender norms channel that are going in the opposite directions.

[14]The minimum value of the traditionality index is 0, and the maximum value is 1.92.
[15]The p-value of the test for significance of each proximity variable is 0.13.

Table 3.4: Effects of grandmothers' proximity on measures of traditionality by childhood region type

	Childhood Region Type		
Dependent Variables:	**Total Sample**	**City or Town Center**	**Village**
Having Son Preference:			
District	0.071	-0.043	0.251*
	(0.101)	(0.143)	(0.151)
	{0.616}	{0.999}	{0,128}
F statistic:	121.126	64.947	49.583
AR confidence set (95%)			*[-0.030, 0.580]*
AR confidence set (90%)			*[0.018, 0.520]*
tF confidence interval			*[-0.069, 0.571]*
Town	0.053	-0.030	0.190*
	(0.075)	(0.100)	(0.113)
	{0.615}	{0.999}	{0.125}
F statistic:	186.531	108.175	94.528
AR confidence set (95%)			*[-0.021, 0.427]*
AR confidence set (90%)			*[0.015, 0.383]*
tF confidence interval			*[-0.033, 0.412]*
City	0.052	-0.030	0.189*
	(0.074)	(0.101)	(0.114)
	{0.615}	{0.999}	{0.126}
F statistic:	213.617	107.548	114.823
AR confidence set (95%)			*[-0.023, 0.427]*
AR confidence set (90%)			*[0.013, 0.382]*
Mean dependent variable	0.337	0.300	0.414
	(0.473)	(0.458)	(0.493)
Finding Women's Working Inappropriate:			
District	0.032	-0.000	0.132
	(0.063)	(0.084)	(0.088)
	{0.616}	{0.999}	{0.134}
F statistic:	121.126	64.947	49.583
Town	0.024	-0.000	0.100
	(0.047)	(0.058)	(0.065)
	{0.615}	{0.999}	{0.125}
F statistic:	186.531	108.175	94.528
City	0.023	-0.000	0.099
	(0.046)	(0.059)	(0.065)
	{0.615}	{0.999}	{0.126}
F statistic:	213.617	107.548	114.823
Mean dependent variable	0.084	0.076	0.102
	(0.278)	(0.264)	(0.302)

Table 3.4 (cont'd)

	Childhood Region Type		
Dependent Variables:	**Total Sample**	**City or Town Center**	**Village**
Not Approving Interdenominational Marriage:			
District	0.194*	0.100	0.336**
	(0.111)	(0.150)	(0.151)
	{0.321}	{0.999}	{0.105}
F statistic:	121.126	64.947	49.583
AR confidence set (95%)	*[-0.012, 0.427]*		*[0.067, 0.677]*
AR confidence set (90%)	*[0.023, 0.383]*		*[0.103, 0.617]*
tF confidence interval			*[0.015, 0.657]*
Town	0.145*	0.070	0.254**
	(0.082)	(0.105)	(0.113)
	{0.315}	{0.999}	{0.097}
F statistic:	186.531	108.175	94.528
AR confidence set (95%)	*[-0.008, 0.311]*		*[0.044, 0.500]*
AR confidence set (90%)	*[0.018, 0.285]*		*[0.080, 0.455]*
tF confidence interval			*[0.034, 0.471]*
City	0.141*	0.071	0.253**
	(0.080)	(0.107)	(0.111)
	{0.312}	{0.999}	{0.094}
F statistic:	213.617	107.548	114.823
AR confidence set (95%)	*[-0.008, 0.302]*		*[0.045, 0.487]*
AR confidence set (90%)	*[0.018, 0.277]*		*[0.081, 0.451]*
Mean dependent variable	0.514	0.469	0.605
	(0.500)	(0.499)	(0.489)
Traditionality Index:			
District	0.055	-0.088	0.302*
	(0.103)	(0.145)	(0.157)
	{0.616}	{0.999}	{0.110}
F statistic:	121.126	64.947	49.583
AR confidence set (95%)			*[0.009, 0.644]*
AR confidence set (90%)			*[0.059, 0.582]*
tF confidence interval			*[-0.032, 0.636]*
Town	0.041	-0.061	0.228*
	(0.077)	(0.101)	(0.118)
	{0.615}	{0.999}	{0.105}
F statistic:	186.531	108.175	94.528
AR confidence set (95%)			*[0.009, 0.475]*
AR confidence set (90%)			*[0.047, 0.429]*
tF confidence interval			*[-0.003, 0.460]*
City	0.040	-0.063	0.227*
	(0.075)	(0.103)	(0.118)
	{0.615}	{0.999}	{0.108}
F statistic:	213.617	107.548	114.823
AR confidence set (95%)			*[0.008, 0.475]*
AR confidence set (90%)			*[0.045, 0.428]*
Mean dependent variable	0.464	0.407	0.581
	(0.475)	(0.438)	(0.523)
Observations	3,542	2,380	1,162

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. P-values, adjusted for multiple hypothesis testing, are displayed in {curly brackets}

We also investigate the differential effects of grandmothers' proximity on traditionality variables in the subsample of mothers with a child aged 0 to 5 (i.e., a preschool-age child) and those with a school-age child aged 6 to 10. The gender norm cost associated with working mothers of children aged 0 to 5 might be higher, as prevalent gender norms support the view that women's primary responsibility is childcare and household chores. In other words, working while having a child who needs extensive childcare might be less accepted culturally. We present these results in Table 3.5. The evidence shows that grandmothers' proximity significantly affects mothers' traditional gender views for mothers with children 5 years old or younger.[16] However, for the mothers with children aged 6 to 10, the coefficients are on the opposite sign. Therefore, for mothers with a child aged 0 to 5, we expect the traditional gender view channel to work in the opposite direction to reduce the effects of grandmothers' childcare provision. In Table 3.5, we also repeat the same exercise according to mothers' education level and house ownership status.[17] The results for different education levels do not provide any significant and consistent pattern.[18] Similarly, the estimates according to house ownership do not provide any significant results.

Finally, we investigate whether the proximity to mothers and mothers-in-law differentially affects women's own perceptions of traditionality and religiosity. We present the results in Table B.7. In the first two panels, we observe that the proximity of mothers and mothers-in-law exhibits opposite signs, but no consistent

[16]As an additional check, we also run our analysis in a pooled sample, incorporating an interaction term between the availability of children aged 0–5 and the proximity variable, along with baseline control variables. Our results show that the coefficient of the interaction term is statistically significant (see Table B.8).

[17]Estimates of the proximity variable, when defined as living in the same district or closer, are not reported for the group of mothers who have at least college degrees, as F-statistics are small.

[18]Although, the estimated coefficients are positive for the traditionality index for at least college-educated women, the estimates on 'Finding Women's Working Inappropriate' are negative. Therefore, these results do not provide any consistent evidence.

pattern emerges for either group.[19] Therefore, we shift our focus to the overall traditionality index, which represents the first principal component of the following variables: 'Having Son Preference,' 'Finding Women's Working Inappropriate,' and 'Not Approving Interdenominational Marriage.' Based on estimates for the traditionality index, we find that coefficients for both mothers and mothers-in-law are statistically insignificant and exhibit similarity. Therefore, we conclude that the differential effects we observe concerning the proximity of mothers and mothers-in-law on labor market outcomes of mothers are not driven by their differential impacts on perceptions of traditionality.

[19] The only exception is the significant positive effect we observe for 'Not Approving Interdenominational Marriage.'

Table 3.5: Effects of grandmothers' proximity on the indicators of traditionality for different subgroups

Subgroups:	*Dependent Variables*					
Age of the youngest children: 0–5						
	Traditionality Index			**Finding Women's Working Inappropriate**		
	District	Town	City	District	Town	City
	0.232*	0.184*	0.209*	0.076	0.061	0.069
	(0.138)	(0.110)	(0.127)	(0.078)	(0.062)	(0.070)
F statistic:	68.101	97.917	82.679	68.101	97.917	82.679
AR confidence set (95%)	*[-0.035, 0.522]*	*[-0.029, 0.405]*	*[-0.027, 0.476]*			
AR confidence set (90%)	*[0.008, 0.466]*	*[0.006, 0.370]*	*[0.011, 0.433]*			
tf confidence interval	*[-0.050, 0.514]*	*[-0.031, 0.399]*	*[-0.044, 0.463]*			
Mean dependent variable		0.456			0.0836	
		(0.277)			(0.407)	
Observations			2,345			
Age of the youngest children: 6–10						
	District	Town	City	District	Town	City
	-0.224	-0.153	-0.127	-0.002	-0.002	-0.001
	(0.168)	(0.113)	(0.094)	(0.104)	(0.071)	(0.059)
F statistic:	45.169	87.755	145.847	45.169	87.755	145.847
Mean dependent variable		0.479			0.0852	
		(0.485)			(0.279)	
Observations			1,197			
Education: Secondary or less						
	District	Town	City	District	Town	City
	0.026	0.020	0.020	0.032	0.025	0.025
	(0.105)	(0.082)	(0.080)	(0.063)	(0.049)	(0.048)
F statistic:	125.774	188.162	223.951	125.774	188.162	223.951
Mean dependent variable		0.514			0.096	
		(0.489)			(0.295)	
Observations			2,936			
Education: College or above						
	District	Town	City	District	Town	City
	–	0.171	0.154	–	-0.033	-0.030
		(0.154)	(0.137)		(0.093)	(0.084)
F statistic:	2.249	15.538	19.807	2.249	15.538	19.807
Mean dependent variable		0.0.222			0.026	
		(0.298)			(0.160)	
Observations			606			
Home Ownership: Owner						
	District	Town	City	District	Town	City
	0.056	0.040	0.039	-0.030	-0.021	-0.021
	(0.138)	(0.099)	(0.098)	(0.091)	(0.065)	(0.065)
F statistic:	74.456	141.972	144.794	74.456	141.972	144.794
Mean dependent variable		0.481			0.088	
		(0.481)			(0.284)	
Observations			1,725			
Home Ownership: Not owner						
	District	Town	City	District	Town	City
	0.076	0.057	0.052	0.106	0.079	0.073
	(0.172)	(0.128)	(0.119)	(0.100)	(0.074)	(0.068)
F statistic:	41.993	59.308	75.185	41.993	59.308	75.185
Mean dependent variable		0.448			0.080	
		(0.468)			(0.272)	
Observations			1,817			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Dependent variables are Traditionality Index and Finding it Inappropriate for Women's Working. Control variables are the same as the baseline estimation.

3.3.3. Elderly Care Channel

In this section, we investigate whether the proximity of grandmothers affects mothers' labor market outcomes through the elderly care channel. To examine this channel, we focus on the subsample of mothers who do not co-reside with an elderly individual. We make this choice as intergenerational co-residence is an important determinant of elderly caregiving (Pezzin & Schone 1999), and co-residence with an elder care recipient reflects increasing care demands (Heitmueller 2007). Aytaç (1998) and Aykan & Wolf (2000) show that in Turkey, co-residence primarily reflects the traditional caregiving pattern for elderly parents. Consequently, we exclude individuals in co-residency from our analysis to understand its effects on our results. The results in Table B.9 show that the coefficients increased slightly for the shortest proximity definition, and the results for other proximity definitions are consistent with baseline estimates, which shows that the possible effects of elderly care on our estimates are negligible.

In Appendix B.1, we also investigate the differential effect of proximity by the availability of a sister or sister-in-law. Our motivation stems from the observation that daughters-in-law and daughters are the main providers of care to older people. Therefore, we argue that if the elderly care channel is an important factor that can decrease women's labor market participation, the availability of a sister or sister-in-law might decrease the burden of elderly care so that it may augment the effects of the proximity of grandmothers. On the other hand, if the childcare channel is important, grandmothers may prioritize their daughters, which may decrease the effects of the proximity of grandmothers. We find that women with at least one sister-in-law are less likely to experience labor market advantages stemming from the mother-in-law's proximity. If the mother-in-law's proximity affects mothers' labor supply through the elderly care channel, women with at least one sister-in-law would share the burden of elderly care and provide fewer hours of care, which would increase the labor supply of women. Therefore, these results do not provide evidence that the proximity of grandmothers' affects daughters' LFP through the elderly care channel.

Overall, our results on mechanisms show that the elderly care channel does not have the potential to have a significant impact on our results. However, the traditional gender norm channel might be important, especially for women who have been raised in village areas. In the next section, we investigate the heterogeneity of the main results by considering our results in this section.

3.4. Conclusion

In this chapter, we focus on specific mechanisms that drive the causal relationship between grandmothers' geographical proximity and mothers' labor force participation. Our analysis identifies three primary channels: childcare provision, traditional gender norms, and elderly care responsibilities. Being close to grandmothers can increase women's labor market participation through free and flexible childcare, which can also be considered an insurance mechanism. However, at the same time, grandmothers living at a close distance can impose the traditional gender norms that are prevalent in the population, or grandmothers living in close proximity may require elderly care, which would decrease women's labor market participation. Therefore, the direction of the effect is ambiguous.

We show that for women with no children or those with older children and for fathers with young children whose primary responsibility does not include childcare activities, the proximity of grandmothers has no significant impact on their labour market outcomes. We also find that grandfathers' proximity does not affect the labour market outcomes of women with young children. These results show that grandmothers' proximity affects the labour market outcomes of mothers with children primarily through their childcare provision. We also examine the effects of grandmothers' proximity on traditionality and find that grandmothers' proximity has a significant and positive impact on the traditionality of women raised in villages. Finally, we show that the elderly care channel does not affect our main results. Therefore, we argue that grandmothers' proximity affects mothers' labour market outcomes through childcare and traditional gender norm channels.

Overall, the chapter demonstrates that grandmothers' proximity positively influences mothers' labor force participation primarily through the provision of childcare. These findings highlight the complex interplay between familial support structures and labor market outcomes, emphasizing the need for policies that consider these dynamics to effectively promote female labor force participation.

CHAPTER 4

THE IMPACTS OF SYRIAN REFUGEES ON NATIVES' HEALTH OUTCOMES

4.1. Introduction

By the end of 2020, more than 80 million people worldwide were forcibly displaced, and 86 percent were hosted in developing countries (UNHCR, 2020). While the growing number of immigrants is associated with a high incidence of threats to locals' living standards,[1] There is still some disagreement in the empirical literature over the economic impact of the migrant influx in the labor market.[2,3] On the other hand, relatively little research has been conducted to examine the relationship between migration and health. Previous studies primarily focused on economic migrants and health outcomes in developed countries. Using German Socio-Economic Panel Data, Giuntella & Mazzonna (2015) show that a higher share of unskilled immigrants in the labor market increases the likelihood that

[1]The complex impacts of refugee inflow on alternative measures of welfare have been addressed in abundant literature; see, e.g., Foged & Peri (2016), Akgündüz & Torun (2020), and Altındağ et al. (2020) for task content and productivity, Alix-Garcia & Saah (2010) and Balkan & Tumen (2016) for price effects, Tumen (2021) for educational outcomes, and Akay et al. (2014) and Betz & Simpson (2013) for effects on natives' well-being.

[2]In a U.S. context, while Borjas (2017) argues that workers experience decline in wages, Ottaviano & Peri (2012) provide evidence for wages of natives being benefit from migration. On the other side, Card (2009) finds that immigration has only a minor effect on native wages.

[3]See Mackie & Blau (2017) for a literature review on the labor market implications of migration.

residents report better health outcomes by sorting natives into safer occupations. Bellés-Obrero et al. (2021) show that the inflow of immigrants to Spain induced natives to pursue less manual-intensive occupations and reduced workplace accidents among Spanish-born workers. Similarly, Dillender & McInerney (2020) show that Mexican immigration to the United States shifted natives to safer jobs, resulting in fewer workers' compensation benefit claims. Some papers establish the health implications of the displaced populations through alternative channels. Escarce & Rocco (2018) demonstrate that immigration improves physical and mental health and reduces mortality among older natives in Europe. The mechanism underlying these beneficial health effects is that the increasing supply of immigrants provides low-cost personal and household services. In a developing country context, Baez (2011) provides evidence on the adverse health consequences of the refugee inflow from Burundi and Rwanda on local children living close to refugee camps in Tanzania by using chronic morbidity and infant mortality as indicators of health measures. Contributing to this literature, in this chapter, we investigate the effects of Syrian refugees on natives' health outcomes in Turkey.

The Syrian Civil War began in the Spring of 2011 and led to a massive influx of refugees. By the end of 2020, 6.7 million refugees, of which Turkey welcomed 3.6 million under the temporary protection regime, were displaced to neighboring countries. An open-door policy for refugees and free access to public services differentiate Turkey from many refugee-hosting countries. Cultural similarities and the generous welcoming policy of the Turkish government contribute to this massive refugee influx. While Syrians initially lived in camps in border provinces, over time, they started to move out of camps and relocate to cities or towns that were better in terms of labor market opportunities and living conditions.

In this chapter, we investigate the effect of large-scale refugee inflow on the *self-assessed health status* of natives in the context of a middle-income country and explore the main causal channels. We use the repeated cross-sectional Turkstat Income and Living Conditions Survey for the 2006–2019 period and combine it with the data on the ratio of refugees to natives provided by the Directorate General of Migration Management. Our empirical analysis exploits the regional variations in exposure to the inflow of Syrian refugees to identify the impact on natives' health outcomes. To take into account the nonrandom allocation of refugees across provinces, we use the distance-based instrument as in Aygün et al. (2021).[4]

The massive refugee influx can affect natives' health outcomes through different channels. Firstly, refugees might affect the health outcomes of natives through their effects on natives' labor market outcomes. Until 2016, Syrian refugees did not have access to the formal labor market. In 2016, Turkey introduced a work permit system for refugees, which was an important step toward including refugees in the Turkish economy. Yet, only a small percentage of Syrians were granted work permits. Limited skills and the young age of most Syrian refugees push them into the informal labor market.[5] The high incidence of informality in Turkey is another factor contributing to the refugees' strong attachment to informal jobs.[6] Given the intense competition between the host population and refugees in the labor market, natives might lose their jobs, have a hard time finding a job, and/or face a wage reduction that will eventually cause poor quality of life and result in stress-related diseases and physical health problems. On the other hand, an increase in the supply of informal labor might improve working conditions and reduce injuries or

[4]They refine the instrument introduced by Del Carpio & Wagner (2015) by accounting for four neighboring countries (Turkey, Lebanon, Jordan, and Iraq) as a final destination that might eventually affect the size of the refugee inflow to Turkey.

[5]There is a large literature on the impact of Syrian refugees on the local population's labor market outcomes in Turkey; see, e.g., Aksu et al. (2018), Ceritoglu et al. (2017), Del Carpio & Wagner (2015), Tumen (2016), Akgündüz & Torun (2020), Altındağ et al. (2020), and Cengiz & Tekgüç (2021).

[6]According to a recent report by the TURKSTAT, by the end of 2020, the rate of unregistered employment is 31.0%.

any work-related diseases among natives. Therefore, the overall effect of the refugee influx on natives' health through the labor market channel is not clear, and it might change according to natives' education levels or employment status.

Another possible channel is the overcrowding in the health system. The refugees might overcrowd the health system, through which the natives' health outcomes might be affected. The Turkish government granted free access to public health services to all registered Syrian refugees. Additionally, unregistered Syrians can use preventive and emergency services for free (Aygün et al. 2021). Considering the fact that Syrian refugees spend a long period of time on travel before reaching their host countries, the poor travel conditions, together with the poor health status of a growing number of refugees (especially the youngest and the elderly)[7], the pressure on health services might have an adverse effect on the natives' health. Moreover, an unprecedented rise in the number of refugees might spread specific diseases to the general population.

Our results show that refugee inflow does not have any significant effect on the self-assessed health status of being good or very good in the total sample, while the results are positive and significant for the male sample. Our sub-sample analysis, according to the level of education and employment status, shows interesting patterns. Syrian refugees have a positive impact on high-skilled[8] and employed natives' health outcomes, which are driven by the male sample. On the other hand, the results are negative and significant for the unemployed male sample. For the low-skilled natives, we do not find evidence of significant effects on their health

[7]According to a recent survey of Syrian refugees living in Turkey, 15.2% of respondents reported having chronic diseases, with 56.6% among elders (Mipatrini et al. 2019). Another survey implemented by the Ministry of Health finds that almost 59% of the Syrian refugees are at high risk of non-communicable diseases (Balcilar 2016).

[8]We define high-skilled individuals as high school graduates and above and low-skilled individuals as those who did not complete secondary education.

outcomes. We also do not find any significant effects among females.[9]

The evidence of better health outcomes for employed or highly skilled natives and worse health outcomes for unemployed natives emphasizes the significance of labor market status and its health consequences. As a consequence, we contend that labor-market adjustments may have been the causal channel that resulted in these findings. We argue that the complementarity of tasks between natives and refugees might explain the improvement observed among highly skilled and employed natives' health status, as supported by the findings of Akgündüz & Torun (2020) that find that refugee inflow decreases the routine and manual intensities of jobs high-skilled natives perform, while the abstract intensities of their jobs increase.

For unemployed males, the negative effects of refugees point to the importance of the refugees' effect on job loss or job-finding probabilities. Therefore, we investigate whether refugee inflow has any effect on natives' job loss, job finding, employment and unemployment probabilities as a causal mechanism. Finally, we investigate whether overcrowding in the health system has the potential to explain our results. Overall, our results suggest that overcrowding in the health system cannot be the mechanism that leads to our results, and the labor market channels explain our results depending on the individual characteristics of natives, including their gender and skill level.

The chapter is most closely related to Aygün et al. (2021) that investigate the refugee inflow on the health infrastructure and the mortality outcomes of natives using province-level data in Turkey. While their instrumental variable estimates

[9] Consistent with our result, Giuntella & Mazzonna (2015) do not find significant effects among women, attributing it to the small number of women employed in physically intensive jobs. Similarly, Akay et al. (2014) find no evidence of a significant effect on the well-being of women. Finally, Giuntella et al. (2019) and Bellés-Obrero et al. (2021) report significant effects for women, but coefficients are smaller than their male counterparts.

indicate no evidence of the effects of refugees on natives' mortality for any age group, they observe a decline in healthcare resources. We complement their findings by showing that refugees have an effect on self-reported health outcomes. Additionally, our heterogeneous findings for different subgroups highlight the importance of subgroup analysis, which may reveal different patterns.[10]

Our chapter also contributes to the broad literature that investigates the possible effects of voluntary immigrants on locals' health outcomes in high-income countries (Bauer et al. 1998, Dillender & McInerney 2020, Bellés-Obrero et al. 2021, Escarce & Rocco 2018, Giuntella & Mazzonna 2015, Akay et al. 2014). We complement this literature by presenting evidence of a previously explored mechanism in the context of a middle-income country that provides unlimited access to healthcare services and suffers from a refugee-induced labor supply shock.

The organization of the chapter is as follows: The next section gives background information and describes the data. Section 4.3 introduces the conceptual framework. We explain the methodology in Section 4.4, report the results in Section 4.5, and investigate the mechanisms of our results in Section 4.6. We implement several robustness checks to verify our findings in Section 4.7. Section 4.8 concludes the chapter.

4.2. Background and Data

With the start of the Syrian civil war in March 2011, Syrians began to flee to neighboring countries, including Turkey, Lebanon, Jordan, and Iraq. As Turkey had an "open-door policy" for the refugees, Syrians could enter Turkey without visas. Additionally, in October 2011, the Turkish government announced that

[10] In a related study, İkizler et al. (2020) document an increase in unmet healthcare needs of natives due to the massive refugee influx.

Syrians would be granted "temporary protection" status, which includes the right to access health and education services for those under protection (Erdoğan 2020). Therefore, as of 2020, out of 6.7 million Syrian refugees registered in the neighboring countries, 3.6 million reside in Turkey. The vast majority of those living outside camps are primarily concentrated in the Turkish border provinces and other major cities in Turkey. In comparison, only 1% of Syrians live in Temporary Accommodation Centers (Migrants' Presence Monitoring Annual Report 2020).

Turkey has implemented a generous medical-care policy for Syrian refugees. Registered refugees have access to free health care services provided by public institutions in their registration province. Furthermore, regardless of registration status, all Syrian refugees have free access to preventive and emergency services (Aygün et al. 2021).

Turkey also introduced a work permit system for Syrian refugees with the regulation issued in January 2016. Syrian refugees can apply to the Labor Ministry for work permits after registering as a temporarily protected person.[11] However, obtaining work permits was difficult because the employer had to request the permit, requiring them to pay the minimum wage. Given the high informal employment rate in Turkey, this initiation was not successful. A document released by UNHCR in 2020 reports that the total number of Syrian citizens who declared a work permit in Turkey was only 132,497.

Table 4.1 documents the differences between Syrian refugees and natives in terms of background characteristics. Table 4.1 shows that Syrian refugees are younger and less educated than the natives. These two factors lead to the employment of refugees in low-paying jobs that tend to be highly exploitative and physically demanding (Orrenius & Zavodny 2009).

[11] For detailed information see İçduygu & Şimşek (2016).

Table 4.1: Background Characteristics of Syrian Refugees and Natives in Turkey

	Syrian Refugees	Natives
Gender:		
Male	0.54	0.50
Age:		
0-14	0.41	0.23
15-64	0.58	0.68
65+	0.02	0.09
Education:		
Illiterate	0.33	0.03
No Degree (literate)	0.13	0.11
Primary Educ.	0.17	0.4
Lower-Sec.	0.07	0.12
Upper-Sec. or Higher	0.06	0.33
Unknown	0.27	0.01
Total	3,576,370	83,154,997

Source:Retrieved from Erdoğan (2020) and Turkstat.

In this chapter, we use the 2006–2019 Income and Living Conditions Survey (SILC) microdata set conducted by the Turkish Statistical Institute (TURKSTAT) to examine how Syrian refugees affect the health outcomes of natives. SILC is collected to generate data on income distribution, relative poverty based on income, living conditions, and social exclusion. We are using the cross-section version of SILC, which is representative at the NUTS-1 level. It consists of individual and household questionnaires. Individual questionnaires cover all individuals over 15 who live in a household and contain information on a broad range of socio-economic indicators. The SILC also provides information on health outcomes. Specifically, respondents were asked about their health status with the following question: *How is your health in general?* The possible answers are (1) Very good, (2) Good, (3) Fair, (4) Bad, and (5) Very Bad. We define a binary variable "Healthy" that is equal to 1 for those individuals who responded "Very Good" or "Good" and 0 otherwise.[12]

[12]Self-assessed health status has been shown to be a good predictor of health deterioration such as mortality or multiple morbidities (Mossey & Shapiro 1982, Idler & Benyamini 1997, Bailis et al. 2003, Franks et al. 2003).

We combine these micro-level data sets on natives with data on the number of Syrians across the 81 provinces of Turkey from 2012 to 2019. This data set is obtained from the Directorate General of Migration Management.[13]

We restrict our sample to individuals aged between 15 and 64. The final sample consists of around 580,000 observations. Table 4.2 presents the descriptive statistics of the variables used in our analysis. We report them separately before and after the arrival of refugees, i.e., for the periods of 2006-2011 and 2012-2019. The table shows that, on average, natives are relatively healthier following the refugee inflow, and the difference between these two periods is statistically significant. However, there are also significant differences in the educational level of individuals between the two periods. Therefore, it requires a refined analysis to understand whether natives have relatively better health outcomes after the refugee inflow.

We use the ratio of refugees to natives to investigate the effect of refugees on natives' health outcomes, which takes into account the intensity of refugee shock natives experience. Figure C.1 displays there is substantial variation in the ratio of refugees to natives across NUTS-1 regions and over time. Figure 4.1 depicts the ratio of refugees to the native population in 2013, 2016, and 2019, where darker shades represent a larger share. In 2013, the vast majority were located in provinces closer to the Syrian border. Over time, they flee to other industrialized cities such as Mersin, Adana, Istanbul, Bursa, and Izmir. This documents the importance of considering the geographical distance to the main migration points in our empirical analysis.

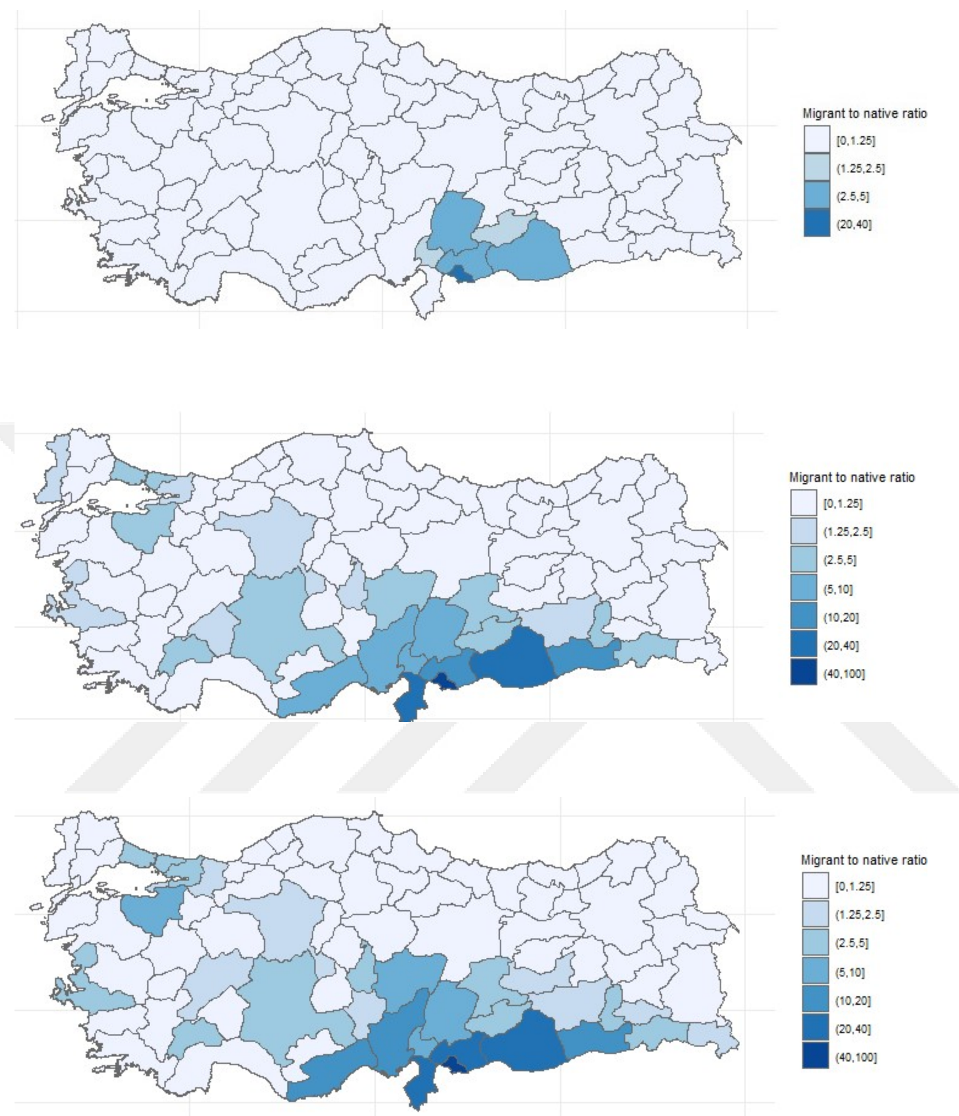
[13] We have the residential location of respondents in SILC at the NUTS-1 level. Therefore, we aggregate information on the number of refugees at the NUTS-1 level to match our main data set.

Table 4.2: Descriptive Statistics

	2006-2011		**2012-2019**		**Differences**	
	Mean	SD	Mean	SD	Mean	SD
Healthy	0.693	(0.461)	0.722	(0.448)	0.029***	(0.001)
Age Groups:						
Aged 15-19	0.136	(0.343)	0.13	(0.336)	-0.006***	(0.001)
Aged 20-24	0.115	(0.319)	0.098	(0.298)	-0.017***	(0.001)
Aged 25-29	0.123	(0.329)	0.107	(0.309)	-0.016***	(0.001)
Aged 30-34	0.115	(0.319)	0.114	(0.318)	-0.001	(0.001)
Aged 35-39	0.109	(0.311)	0.115	(0.319)	0.007***	(0.001)
Aged 40-44	0.103	(0.305)	0.106	(0.308)	0.002**	(0.001)
Aged 45-49	0.096	(0.295)	0.097	(0.296)	0.001	(0.001)
Aged 50-54	0.084	(0.278)	0.092	(0.288)	0.007***	(0.001)
Aged 55-59	0.067	(0.250)	0.077	(0.267)	0.010***	(0.001)
Aged 60-64	0.051	(0.219)	0.064	(0.244)	0.013***	(0.001)
Male	0.483	(0.500)	0.49	(0.500)	0.008***	(0.001)
Married	0.697	(0.460)	0.64	(0.480)	-0.056***	(0.001)
Education:						
No School	0.178	(0.383)	0.138	(0.345)	-0.040***	(0.001)
Primary	0.558	(0.497)	0.537	(0.499)	-0.021***	(0.001)
Secondary	0.18	(0.384)	0.185	(0.388)	0.005***	(0.001)
Tertiary	0.084	(0.278)	0.14	(0.347)	0.056***	(0.001)
Household Size	3.407	(1.559)	3.248	(1.474)	-0.159***	(0.004)
Observations	176,870		406,935		583,805	

Source: 2006-2019 Income and Living Conditions Survey Micro Data Set (Cross-Sectional)

Figure 4.1: Syrian refugees in Turkey, 2013, 2016 and 2019



Source:Ministry Interior of Turkey and Turkstat.

4.3. Conceptual Framework

In this section, we discuss the potential channels through which forced migrants can affect the locals' health outcomes. Refugees and migrants might pose a threat to natives by transmitting infectious diseases from one location to another. Especially undocumented immigrants from less developed countries show a higher prevalence of infections (López-Vélez et al. 2003, Parenti et al. 1987, Akresh & Frank 2008, Grove & Zwi 2006). Besides, refugees living in poor conditions might place a high burden on the host country's health system through high utilization of healthcare services (Aygün et al. 2021). Therefore, we might observe a detrimental effect of refugee flow on natives' health.

The second channel is the labor market consequences of a refugee supply shock. Natives living in areas with a high concentration of refugees might lose their jobs or face a wage reduction, depending on the degree of substitutability between native workers and migrants.[14] We would expect that unemployment, a stressful life event, causes poor health (Strully 2009, Hamilton et al. 1997, Gerdtham & Johannesson 2003). On the other hand, immigrants are more likely to work in risky jobs that do not require any educational qualifications or language skills (Orrenius & Zavodny 2009). Therefore, native workers tend to specialize in abstract tasks that are less physically strenuous (Akgündüz & Torun 2020) and relate to better health outcomes (Giuntella & Mazzonna 2015). Considering the channels through which refugee inflow can affect the health outcomes of local citizens, the overall effect depends on which effect dominates. In addition, the effect may differ between different groups according to the education level and employment status of natives. Therefore, in our empirical analysis, we investigate the heterogeneity of the effects

[14] See Becker & Ferrara (2019) and Verme & Schuettler (2021) for a review of the literature.

of refugees on natives' health outcomes.

4.4. The Empirical Methodology

We exploit the variation in the ratio of refugees to natives between 2006 and 2019 to estimate the impact of refugee inflow on natives' health outcomes. We estimate the following regression equation:

$$Y_{ipt} = \psi + \alpha Ratio_{pt} + {X_{ipt}}'\beta + \delta_p + \delta_t + \theta_{pt} + \epsilon_{ipt} \tag{4.1}$$

where Y_{ipt} is the health outcome of the individual i at time t in region p, which denotes regions at the NUTS-1 level (12 regions). The health outcome is a binary variable, taking the value of one if the individual reports having good or very good health. $Ratio_{pt}$ is the ratio of refugees to natives in region p at time t.

X_{ipt} is a vector of individual and household characteristics used as control variables in the model, including age intervals fixed effects[15], an indicator for gender, dummies for three education categories (less than primary education (omitted), primary, secondary, and tertiary education), a dummy for marital status, and household size. We also add region fixed effects at the NUTS-1 region level, δ_p and survey year fixed effects, δ_t. Region fixed effects control for the time invariant factors that can affect natives' health outcomes. The year fixed effects capture the changes in health inputs at the national level over time. θ_{pt} stands for five region-year fixed effects. Finally, ψ is the constant term, and ϵ_{ipt} is the error term.

[15]Until 2010, SILC provided age groups at five year intervals.

The use of regional variations in the refugee-to-native ratio may give biased estimates of the effects of refugees on natives' health outcomes for the following reasons. First, following the refugee influx, natives may move to non-treated regions. If internally displaced people are healthier than stayers, this generates a negative bias. Second, refugees tend to locate in regions with better economic conditions and quality health services, which would cause our estimates to be biased. To overcome the issue of endogeneity, we use a distance based instrument employed in Aygün et al. (2021). Our instrument is defined as follows:

$$I_{pt} = \sum_{s=1}^{13} \frac{\left(\frac{1}{d_{s,T}}\right)\pi_s}{\left(\frac{1}{d_{s,T}} + \frac{1}{d_{s,L}} + \frac{1}{d_{s,J}} + \frac{1}{d_{s,I}}\right) d_{p,s}} \frac{T_t}{d_{p,s}} \tag{4.2}$$

where I_{pt} is the expected number of refugees received in NUTS-1 region p at time t and $d_{s,T}$, $d_{s,L}$, $d_{s,J}$, and $d_{s,I}$ stand for the travel distance from Syrian province s to the closest point of entry in four neighboring countries: Turkey, Lebanon, Jordan, and Iraq, respectively. π_s is the pre-war population share in Syrian province s, $d_{p,s}$ is the distance of Turkish region p[16] [17] to Syrian province s, and T_t is the total number of refugees in four neighboring countries at a given point in time t. The instrument proxies the sum of the expected number of refugees across Syrian provinces for each Turkish NUTS-1 region at time t. We cluster the standard errors at the NUTS-1 region-survey year level.[18] In the next section, we present our results.

[16] We use Google Maps to obtain the travel distance in kilometers.

[17] The cities with higher GDP are considered to be the capitals of each NUTS-1 region.

[18] In equation 2.1, we also cluster standard errors at the NUTS-1 region - pre- and post refugee influx (24 clusters) as an alternative specification. Since the number of clusters is few, we present wild-cluster bootstrap p-values in Table C.2, C.3, and C.4. Although some of our coefficients are less precisely estimated, the p-values of the test for significance of the key variable of interest are less than 0.15.

4.5. Results

We, first, estimate equation 4.1 for the total sample, as well as female and male samples for the health outcome of “Healthy”. Table 4.3 presents these results. In the first column, we present ordinary least squares (OLS) estimation results where we regress health outcome on the ratio of refugees to natives, along with other control variables that we explained in the previous section. These findings indicate that there is a positive correlation between the refugee inflow and natives’ health outcomes in the whole sample, but the correlation is significantly positive only in the male sample. Specifically, as the ratio of refugees to the native population increases, native males are more likely to report feeling healthy.

As we mentioned earlier, OLS results are biased due to endogeneity and reverse causality problems; therefore, these estimates do not provide a causal relationship. In order to get the causal effect of the refugee inflow on natives’ health outcomes, we use the instrument adopted in Aygün et al. (2021) and introduced in the previous section as a proxy for the geographical concentration of refugees. In Table C.1, we present the first-stage results. As Table C.1 shows, the expected number of refugees is a strong predictor of the refugees to natives ratio. F-statistics are far larger than the acceptable threshold of 10 suggested by Staiger & Stock (1994) and 104.7 suggested by Lee et al. (2022), ensuring that our instrument is sufficiently strongly correlated with the endogenous variable.

We present the IV results for the total sample, male and female samples in the second column of Table 4.3.[19] Our IV analysis indicates that while the refugee-to-native ratio has a positive effect on the health outcome for the total sample, this effect is not statistically significant. However, the results for male and

[19]In Table C.5, we present the coefficient of other control variables.

Table 4.3: Effect of Refugees on the Health Outcomes

Dependent Variable: Healthy	OLS	IV
Total		
Refugee-to-native ratio	0.081	0.113
	(0.073)	(0.076)
F statistic		832
Mean dependent variable	0.714	0.714
	(0.452)	(0.452)
Observations	583,805	
Male		
Refugee-to-native ratio	0.141**	0.156**
	(0.068)	(0.072)
F statistic		826
Mean dependent variable	0.754	0.754
	(0.431)	(0.431)
Observations	284,828	
Female		
Refugee-to-native ratio	0.033	0.078
	(0.089)	(0.091)
F statistic		835
Mean dependent variable	0.675	0.675
	(0.468)	(0.468)
Observations	298,977	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.The dependent variable is a dummy indicating good or very good health status.

female samples show that the refugee-to-native ratio has a significant positive effect on being healthy in the male sample, while the effect is insignificant and small in the female sample. Specifically, we find that a 10 percentage point (ppt) increase in the refugee-to-native ratio leads to a 1.6 percentage point (2.06%) increase in self-assessed health outcome for the male sample.

As discussed in Section 4.3, the impact of refugees may vary depending on the education level and employment status of natives. To investigate these potential differences in various subgroups, we report the IV estimation results according to employment status and education level categories in Table 4.4.

The first column in Table 4.4 shows the estimated effects for the pooled sample of males and females, and the next two columns present the estimates for males and females, respectively. In each panel, we present the results for different sub-samples. The first two panels show the results for the employed individuals who are regular or casual employees, employers, or unpaid family workers, and their counterparts who are not employed.[20,21] In the next panel, we present the results for unemployed individuals who are not working but are actively looking for a job. Then, we split the sample according to the education level of individuals: high-skilled (have at least a high school degree) and low-skilled (have less than a high school degree) individuals. This analysis allows us to investigate whether the

[20]The results of the analysis are unchanged if unpaid workers are not included in the employment (see Table C.6).

[21]In SILC, employment is defined as one, if the self-reported current economic status falls under categories such as full-time employee, part-time employee, unpaid family worker, full-time self-employed, part-time self-employed, or if the individual worked at least one hour to receive income (in kind or cash). This also includes those with a job or business who were not actively working in the previous week but held roles as an employee, employer, self-employed, or unpaid family worker. In HLFS, employment includes individuals who worked for at least one hour during the reference week to earn pay or profit, including contributing family workers. It also includes individuals with a job or business who were temporarily away but remained attached to their employment.When comparing employment variables between one constructed as in HLFS and our definition, our definition considers only 471 additional observations as employed, constituting 0.08% of our sample. Our findings remain robust under the HLFS definition (see Table C.7).

impact of immigration on health outcomes differs across subgroups.

Table 4.4: Effect of Refugees on the Health Outcomes Among Subgroups of Natives

Dependent Variable: Healthy			
	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.244***	0.347***	0.058
	(0.088)	(0.087)	(0.128)
F statistic	806.9	805.5	719.0
Mean	0.784	0.813	0.728
	(0.411)	(0.390)	(0.445)
Observations	237,539	157,155	80,384
Not Employed			
Refugee-to-native ratio	0.058	0.007	0.091
	(0.076)	(0.080)	(0.094)
F statistic	346,266	127,673	218,593
Mean	0.665	0.682	0.655
	(0.472)	(0.466)	(0.475)
Observations	346,266	127,673	218,593
Unemployed			
Refugee-to-native ratio	-0.289***	-0.320***	-0.345
	(0.075)	(0.083)	(0.282)
F statistic	796.3	794.5	659.1
Mean	0.789	0.777	0.827
	(0.408)	(0.416)	(0.378)
Observations	28,253	21,759	6,494
Low Skilled			
Refugee-to-native ratio	0.111	0.107	0.113
	(0.085)	(0.081)	(0.102)
F statistic	846.5	850.0	842.5
Mean	0.654	0.702	0.614
	(0.476)	(0.457)	(0.487)
Observations	404,798	181,915	222,883
High Skilled			
Refugee-to-native ratio	0.205**	0.292***	0.000
	(0.086)	(0.103)	(0.080)
F statistic	714.3	728.2	677.6
Mean	0.849	0.845	0.854
	(0.358)	(0.362)	(0.353)
Observations	179,007	102,913	76,094

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

The results in Table 4.4 show that for the sample of employed natives, the refugees have a positive and significant effect on natives' health, driven by the male sample. On the other hand, in the sample of the non-working population, we do not observe any effect of the refugee-to-native ratio. A different picture emerges in the sample of unemployed individuals: the refugee-to-native ratio has a negative impact on the health outcome. A 10 percentage point increase in the refugee-to-native ratio leads to a 3.2 percentage point (4.1%) decrease in self-assessed health outcomes in the unemployed sample. When we analyze the male and female samples separately, the coefficient sizes and signs are very similar, but the results are significant only in the male sample, which might be due to the small sample size of unemployed females.

When we investigate the results according to the skill level of individuals, we observe that the refugee-to-native ratio has a significant positive impact on high-skilled natives' health outcomes, which is driven by the high-skilled male sample.[22] For high-skilled women, no evidence of an effect on health outcomes exists. For the low-skilled natives, refugee inflow has a positive impact on health outcomes; however, the effect is insignificant and smaller in size relative to what we observe for the high-skilled natives. Pronounced health effects among high-skilled natives might be attributed to expanded job opportunities associated with complementarity across skill groups. Migrants are known to be complementary to native workers, indicating the expansion of employment of skilled natives (Ottaviano & Peri 2012 and Bean et al. 1988). If the low-skilled Syrian refugees complement high-skilled native workers and increase job opportunities for high-skilled natives, we might expect better health outcomes.[23][24]

[22] In Figure C.2, between 2011 and 2019, the percentage of Syrian refugees in Turkey increased by 4.3 ppt. Multiplying this four ppt increase in the refugee share by the coefficient estimate of 0.292 (Presented in Table 4.4), our estimates suggest an implied effect of a 1.3 percentage point increase (the left-axis). The figure also shows that the share of people with good health increased by 20 percentage points (the right-axis) among natives during the same period. Thus, our results show that Syrian refugees explain 6.5% of the improvement in health outcomes of natives observed during this period.

[23] Cengiz & Tekgüç (2021), Del Carpio & Wagner (2015) and Aksu et al. (2018) show that the refugee inflow increased formal employment among natives.Ceritoglu et al. (2017) attribute this finding to the increased presence of social organizations provided to the Syrian refugees located in these regions.

[24] A large research literature documents that better health is positively associated with job employment status (Clark & Oswald 1994 and Korpi 1997).

4.6. Mechanisms

4.6.1. Labor Market

The evidence of improved health outcomes for employed or high-skilled natives, and deteriorated health outcomes for unemployed natives highlights the importance of the labor market status and its health implications. We argue that adjustments in the labor market might be the causal channel that lead to our results. To strengthen our argument that refugees affect the health of high-skilled native men through the labor market channel, we show that the inflow of refugees increased task complexity of highly educated men by raising the intensity of abstract tasks they perform. We identify the effects of refugees on tasks intensity by computing occupation task scores from the ONET database following the method proposed by Acemoglu & Autor (2011). We merge the ONET data, coded with an extended version of SOC-00 and SOC-10, to the corresponding 4-digit ISCO08 codes. Then, we collapse 4-digit ISCO08 codes to the 1 digit level and merge all subscale values with our main sample. Subsequently, we combine all subscale values with our main sample and sum standardized values annually for each occupation in the SILC sample to construct the abstract score for each occupation. Online Appendix Table C.8 presents the effects of the refugee-to-native ratio on abstract task scores of high and low-educated male employees' occupations. These results provide evidence that abstract intensity rises for highly educated male workers, which is consistent with the findings of Akgündüz & Torun (2020). This finding supports the idea that they are better able to adapt their occupations to those that are complementary to the labor supply of refugees. This result is consistent with the narrative that high-skilled workers' employment rises. Therefore, we claim that the improvement in health outcomes among highly skilled workers can be attributed to the increased abstract intensity of tasks resulting from the influx of refugees.[25,26] On the other hand, the insignificant effect observed in the low-skilled sample might be attributed to job losses or struggles to find a job following refugee inflow. We investigate these channels by constructing "Job Loss" and "Job Finding" indicator variables.

Table 4.5: Effect of Refugees on the Job Loss Probability

	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	0.015	-0.004	0.024
	(0.048)	(0.060)	(0.027)
F statistic	830.318	834.5	763.4
Mean	0.050	0.0602	0.0282
	(0.217)	(0.238)	(0.166)
Observations	322,832	217,056	105,776
Low Skilled			
Refugee-to-native ratio	0.075	0.036	0.056
	(0.060)	(0.075)	(0.035)
F statistic	849.5	861.8	711.8
Mean	0.0517	0.0696	0.0170
	(0.222)	(0.254)	(0.129)
Observations	203,700	134,626	69,074
High Skilled			
Refugee-to-native ratio	-0.048	-0.029	-0.069
	(0.052)	(0.065)	(0.067)
F statistic	707.4	717.8	645.4
Mean	0.0462	0.0448	0.0493
	(0.210)	(0.207)	(0.217)
Observations	119,132	82,430	36,702

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The sample covers individuals who spent at least one month at work in the previous year, and the dependent variable is equal to 1 if the respondent is unemployed in the reference period, 0 otherwise.

[25] The p-value of the test for significance of the key variable is 0.11 for high-skilled workers.

[26] The improvement in health outcomes for the high-skilled natives might also be attributed to the positive wage effects of the Syrian Migration on high-skilled natives (Cengiz & Tekgüç 2021).

We define the "Job Loss" variable as one if the respondent does not work currently but is looking for a job, zero otherwise in the sample of individuals who spent at least one month in full-time or part-time employment one year ago. In Table 4.5, we present the effect of the refugees-to-natives ratio on the job loss variable for the total sample as well as the high- and low-skilled natives sample. In the sample of low skilled individuals, the refugee-to-native ratio has a positive but insignificant coefficient. The results are negative and insignificant for the sample of high-skilled individuals. Overall, there is no statistical evidence showing that job loss might be a channel that can have an effect on natives' health.

We, first, focus on the sample of respondents who spent at least one month in unemployment in the previous year and define the "Job Finding" variable as one if the individual is employed in the survey year and zero otherwise. We repeat the same analysis for the job finding variable. As reported in Table 4.6, the refugee inflow significantly reduced the job finding probability of low-skilled individuals, where the results are significant only for the male sample. As low-skilled natives are more likely to work in manual jobs and immigrants are substitutes for them, their labor market prospects deteriorate. The effect is positive for high-skilled males, but it is statistically insignificant.[27] These findings suggest that the arrival of refugees might deteriorate natives' health by decreasing their chance of finding a job when they are unemployed, which explains our results in the unemployed male sample. Supporting this argument Ceritoglu et al. (2017), Del Carpio & Wagner (2015), and Aksu et al. (2018) show that refugee inflow leads to a reduction in the employment of Turkish male workers in the informal labor market, which is dominated by low-skilled native males. On the other hand, we find no evidence of such an adverse effect among women. This result is not surprising given the

[27] The estimates become significant when we use the probability of being employed or unemployed as alternative dependent variables (see Table C.9).

prevailing societal norms and labor market participation patterns in Turkish setting. Aksu et al. (2018) show that the Syrian refugee-to-native ratio decreases women's total employment, but most women who lose their jobs leave the labor force, so they do not observe an increase in unemployment. This aligns with Turkey's prevalent male-breadwinner, female-homemaker family model, which is the most dominant family type in Turkey due to the persistence of conservatism, cultural constraints such as the traditional sexual division of labor within the household (İlkkaracan 2012, Göksel 2013, Dildar 2015). Therefore, the patriarchal structure contributes to women suffering less psychological distress, unlike men, for whom being unemployed increases mental distress, suffering impaired health (Winkelmann & Winkelmann 1998).

Next, we take into account the heterogeneity between men by age and education. We limit our sample of high-skilled natives (those with high school education and above) to natives aged 25 to 44 and those aged 45 and above, labeled as 'young' and 'old', respectively.[28]

Then, we examine the impact of the refugee inflow on the probability of job loss, job finding, employment, and unemployment by age and education. Tables C.10 and C.11 present the results of the analyzes using job loss and job finding, and unemployment and employment status as outcome variables, respectively. Table C.11 shows that for young and high-skilled men, the probability of being unemployed decreases and the probability of being employed increases. The results in Tables C.10 are insignificant but consistent. In Table C.12, we show the health effect of the refugee-to-native ratio in these subsamples, which aligns with the refugee shock's labor market implications. Our findings indicate a positive impact on the health outcomes of young and high- skilled natives. For the other

[28]In order to have a more homogeneous criterion among high- and low-skilled individuals, we set the age cut-off at 25, the age for completing tertiary education.

Table 4.6: Effect of Refugees on the Job Finding Probability

	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	-0.273*	-0.313*	-0.349
	(0.165)	(0.185)	(0.404)
F statistic	681.4	679.8	605.8
Mean	0.520	0.543	0.422
	(0.500)	(0.498)	(0.494)
Observations	55,124	44,665	10,459
Low Skilled			
Refugee-to-native ratio	-0.495***	-0.478***	-0.824
	(0.180)	(0.183)	(0.666)
F statistic	680.1	674.6	709.4
Mean	0.548	0.561	0.444
	(0.498)	(0.496)	(0.497)
Observations	35,328	31,554	3,774
High Skilled			
Refugee-to-native ratio	0.101	0.078	-0.451
	(0.282)	(0.299)	(0.535)
F statistic	620.2	652.8	412.5
Mean	0.470	0.501	0.409
	(0.499)	(0.500)	(0.492)
Observations	19,796	13,111	6,685

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, five region-year fixed effects. The sample covers individuals who spent at least one month in unemployment in the previous year, and the dependent variable is equal to 1 if the respondent is employed during the reference period, 0 otherwise.

subsamples, while the estimates are positive, they are statistically insignificant.

4.6.2. Overcrowding in the Health System

Aygün et al. (2021) show that refugees have an adverse effect on per-capita healthcare resources in Turkey. In this section, we investigate whether the difficulties in getting access to health resources can have an effect on our results. To explore this particular channel, we focus on individuals who have had an unmet need for medical or dental examination or treatment during the last 12 months. We focus on this group because our data do not allow us to identify whether individuals applied to a health institution and met their needs or simply did not apply. Focusing on this group, we would like to understand whether the reason for unmet needs is not being able to make an appointment on time. These reasons might be related to overcrowding in the health system. To get treatment, individuals have to wait a long time. We use the survey question that asks the reason for unmet need for a medical or dental examination, and construct the "Overcrowding" variable equal to one if the respondents state the main reason for unmet need is giving too late appointment and zero otherwise. We estimate the same model in equation 2.1 with the dependent variable "Overcrowding". Our results presented in Table 4.7, indicate that the influx of refugees leads to an increase in overcrowding across all samples, including males and females, low- and high-skilled individuals, and employed and not-employed, and unemployed individuals.[29]

To provide better insight into overcrowding in the health system, we analyze the relationship between the refugee-to-native ratio and specific variables related to healthcare services. These variables serve as proxies for the high healthcare utilization among refugees in hosting regions and are obtained from the Turkish

[29]It is important to note that the system may triage care in such a way that individuals with unmet medical requirements may experience minor complications that we cannot identify due to the lack of data regarding the severity of the disease; this could result in unfulfilled requests for dental or medical examinations.

Statistical Institute at the NUTS-2 level. They include the number of hospitals (Ministry of Health), the number of hospitals (Universities), the number of hospitals (Other Public), and the number of nurses and physicians per 100,000 natives from 2007 to 2019. These variables reflect both human and physical resources in the healthcare system. We examine the change inhealthcare resources by regressing these variables on the refugee-to-native ratio, year, and region fixed effects at the NUTS-2 level.

Table C.13 presents these results, showing that the refugee-to-native ratio is positively and significantly related to the number of nurses, but it is not associated with the number of physicians and the number of hospitals. As an additional check, we control these factors in our main analysis. In Table C.14, each row includes a different additional control variable, which is additional to those already present in the main analysis (Table C.13). These new independent variables include the number of hospitals (Ministry of Health, and Universities), nurses and physicians per 100,000 natives. In the final analysis, we include all these variables simultaneously. Our results show that the main findings remain robust when these additional control variables are included.

Given that we observe the negative health effect only in the unemployed natives sample, and the refuge-to-native ratio increases overcrowding in all samples, overcrowding in the health system is less likely to be the mechanism that leads to our results. Therefore, we argue that the labor market channel is the main driver of the effects of refugees on natives' health in the Turkish setting.

Table 4.7: Effect of Refugees on the Overcrowding

	Total	Male	Female
Baseline Estimates			
Refugee-to-native ratio	0.196***	0.198***	0.193***
	(0.056)	(0.053)	(0.068)
F statistic	574.5	579.7	568.8
Mean	0.0456	0.0452	0.0460
	(0.209)	(0.208)	(0.210)
Observations	102,305	51,545	50,760
Employed			
Refugee-to-native ratio	0.206***	0.187***	0.234**
	(0.057)	(0.069)	(0.110)
F statistic	530.9	570.1	372.3
Mean	0.0439	0.0468	0.0380
	(0.205)	(0.211)	(0.191)
Observations	41,824	28,027	13,797
Not Employed			
Refugee-to-native ratio	0.200***	0.215***	0.183**
	(0.064)	(0.064)	(0.073)
F statistic	593.6	584.5	598.9
Mean	0.0468	0.0433	0.0490
	(0.211)	(0.204)	(0.216)
Observations	60,481	23,518	36,963
Unemployed			
Refugee-to-native ratio	0.286***	0.199*	1.310***
	(0.105)	(0.106)	(0.397)
F statistic	705.9	701.4	375.2
Mean	0.0334	0.0292	0.0507
	(0.180)	(0.168)	(0.220)
Observations	5,721	4,617	1,104
Low Skilled			
Refugee-to-native ratio	0.163***	0.132**	0.190***
	(0.057)	(0.053)	(0.067)
F statistic	568.8	577.8	561.0
Mean	0.0393	0.0383	0.0401
	(0.194)	(0.192)	(0.196)
Observations	79,712	37,220	42,492
High Skilled			
Refugee-to-native ratio	0.414***	0.463***	0.246
	(0.129)	(0.144)	(0.168)
F statistic	571.1	559.7	582.7
Mean	0.0681	0.0633	0.0764
	(0.252)	(0.244)	(0.266)
Observations	22,593	14,325	8,268

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Control variables are the same as the baseline estimation. The dependent variable is equal to 1 if main reason for unmet need for medical or dental examination or treatment is giving to late time for appointment.

4.7. Robustness Checks

In this section, we present additional analysis to check the robustness of our results. First, we implement a placebo analysis to show that results are not driven by pre-treatment trends in health outcomes. As in Aygün et al. (2021) setup, we use data from the pre-treatment period (2006-2011) and set the year 2011 as the start of refugee inflow rather than 2012. We assume that the refugee distribution in 2019 occurred in 2011 and identify the causal effect. If the instrument is not correlated with the pre-treatment health trends, we should not observe any significant estimates. As can be seen from Table 4.8, no significant effect of the refugee inflow is observed in any of the samples, and the coefficients are small in magnitude compared to our main estimates. Based on these results, the pre-existing trend in health outcomes seems not to have had an effect on our results.

Second, we re-estimate our regression by excluding the Istanbul region to see if the results are driven by the Istanbul region. It is the economic capital of Turkey and hosts the largest number of Syrian refugees, and many refugees live in Istanbul despite being registered in other cities. Table 4.9 shows that our results remain intact when we remove the Istanbul region from our sample.

Finally, as an alternative robustness check, we consider two alternative instruments: i) the instrument determined by distance (Del Carpio & Wagner 2015), and ii) the instrument determined by Arabic-speaking share (Altındağ et al. 2020). Del Carpio & Wagner (2015) use weighted distances to the different governorates in Syria, where weights are defined as the number of registered refugees from these governorates in each province in Turkey.[30] We also use predicted Syrian migrant distribution in provinces according to the regional Arabic

[30]The instrument is calculated as

Table 4.8: Effect of Refugees on the Health Outcomes, Placebo Tests

Dependent Variable:				*Healthy*		
	Total Sample					
	All	Male	Female			
Refugee-to-native ratio	0.041	-0.006	0.071			
	(0.088)	(0.084)	(0.118)			
F statistic	178.1	180.1	176.3			
Mean dependent variable	0.693	0.738	0.652			
	(0.461)	(0.440)	(0.476)			
Observations	176,870	85,343	91,527			
	Employed			**Unemployed**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	-0.011	0.075	-0.205	-0.049	-0.101	0.380
	(0.112)	(0.092)	(0.213)	(0.077)	(0.077)	(0.420)
F statistic	173.1	176.7	145.1	173.8	180.1	117.7
Mean dependent variable	0.765	0.800	0.698	0.770	0.762	0.800
	(0.424)	(0.400)	(0.459)	(0.421)	(0.426)	(0.400)
Observations	69,593	45,668	23,925	8,053	6,428	1,625
	Low Skilled			**High Skilled**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	0.090	0.028	0.115	-0.083	-0.036	-0.189
	(0.095)	(0.097)	(0.123)	(0.110)	(0.128)	(0.141)
F statistic	186.0	191.5	181.9	140.1	147.8	123.8
Mean dependent variable	0.639	0.688	0.599	0.846	0.843	0.850
	(0.480)	(0.463)	(0.490)	(0.361)	(0.364)	(0.357)
Observations	130,114	57,735	72,379	46,756	27,608	19,148

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. We use data from the pre-treatment period and assign the 2019 instrument to 2011. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

Table 4.9: Effect of Refugees on the Health Outcomes Excluding Istanbul (NUTS-1 Region)

Dependent Variable:			*Healthy*			
	Total Sample					
	All	Male	Female			
Refugee-to-native ratio	0.114	0.156**	0.079			
	(0.076)	(0.072)	(0.091)			
F statistic	831.2	826.0	834.9			
Mean dependent variable	0.708	0.749	0.668			
	(0.455)	(0.434)	(0.471)			
Observations	524,635	255,793	268,842			
	Employed			**Unemployed**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	0.245***	0.346***	0.062	-0.292***	-0.322***	-0.354
	(0.088)	(0.086)	(0.128)	(0.075)	(0.083)	(0.285)
F statistic	806.6	805.2	717.8	795.9	793.8	658.6
Mean	0.777	0.809	0.717	0.788	0.778	0.825
	(0.416)	(0.393)	(0.451)	(0.409)	(0.416)	(0.380)
Observations	211,126	138,482	72,644	25,248	19,665	5,583
	Low Skilled			**High Skilled**		
	All	Male	Female	All	Male	Female
Refugee-to-native ratio	0.112	0.107	0.115	0.206**	0.293***	0.001
	(0.085)	(0.081)	(0.103)	(0.086)	(0.103)	(0.080)
F statistic	846.1	846.1	849.6	849.6	842.0	842.0
Mean	0.649	0.698	0.609	0.846	0.842	0.851
	(0.477)	(0.459)	(0.488)	(0.361)	(0.365)	(0.356)
Observations	368,277	164,726	203,551	156,358	91,067	65,291

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

speaking population in the 1965 Census as an instrument for refugee-to-native ratio.[31] The results are given in Table C.15 - C.16 for Del Carpio & Wagner (2015)'s instrument and in Table C.17 - C.18 for Altındağ et al. (2020)'s instrument. By using these instruments, we again find that the refugee-to-native ratio has a positive and significant effect for employed and high-skilled males, while the effect is negative and significant for unemployed males, which are similar to our main results in Table 4.3 and 4.4. Therefore, our results are robust to using alternative instruments.

4.8. Conclusion

By the end of 2020, 6.7 million Syrians had left their country to seek asylum. Turkey welcomed 3.6 million Syrian refugees under the temporary protection regime. This sudden large-scale migration significantly altered host countries' social and economic structures. In this context, as an alternative measure of possible welfare implications, we analyze the impact of refugees on the health of natives using the Income and Living Conditions Survey dataset. We use a two-stage least squares estimation method and a distance-based instrument to account for the endogeneity of the refugees' location choices.

Our results suggest that the refugee inflow improved the health outcomes of high-skilled and employed native males. However, unemployed males experienced health deterioration because of the refugee inflow. The effect for low-skilled males

$$IV_{pt} = \sum_{s} \frac{1}{(Travel\ distance_{sp})} (Prewar\ Syrian\ pop.)_s \times (Total\ number\ of\ reg.\ Syrians\ in\ Turkey)_t \tag{4.3}$$

[31]The instrument is calculated as

$$IV_{pt} = \frac{(Arabic\ Speaking\ in\ 1965)_p}{\sum_p (Arabic\ Speaking\ in\ 1965)_p} \times (Total\ number\ of\ Syrian\ individuals\ displaced)_t \tag{4.4}$$

is positive but small in terms of magnitude and not significant. We also cannot find any effect for females. We estimate that a 10 percentage point increase in the refugee-to-native ratio increases the probability of stating a good health condition by 2.9 ppt (3.4%) and 3.47 ppt (4.3%) for high skilled and employed males, respectively.

We also investigate the mechanisms through which refugees affect the natives' health outcomes. In particular, we focus on two channels: labor supply and overcrowding in the health system. Dividing our sample according to the employment status of individuals, we show that the negative effects are mainly generated by males who are not unemployed, while the positive effect is most pronounced in high-skilled employed males. Therefore, we argue that the complementarity of tasks between natives and refugees explains the improvement in high-skilled natives' health status, as supported by our own analysis and the findings of Akgündüz & Torun (2020). We also find evidence that refugee inflow decreases the probability of finding a job when native males are not employed.

Our results on overcrowding in the health system show that the refugee influx increases the likelihood of natives reporting that the reason for having unmet medical needs is not being able to make an appointment if they have an unmet medical need. We find significant effects in male-female, low-high skilled, and employed-not-employed and unemployed samples. Therefore, we argue that overcrowding in the health system cannot be the mechanism that leads to our results. Thus, the effects of refugees on labor market outcomes drive our results.

We show that although refugees, on average, affect native males' health positively, there is heterogeneity across groups. The health deterioration observed in the unemployed males sample should not be neglected, and government policies should be directed to support unemployed males who are negatively affected by the refugee influx. These policies may include providing job training programs, job matching services, and other forms of support to help them find employment.

CHAPTER 5

CONCLUSION

In this thesis, we explored three critical aspects of labor economics and their implications in the context of Turkey: the role of grandmothers' proximity on mothers' labor force participation, the impacts of Syrian refugees on natives' health outcomes, and the causal effect of maternal employment on children's school enrollment. Each chapter provided unique insights into these issues, contributing to a comprehensive understanding of the socioeconomic dynamics in Turkey.

The second essay highlighted the significant role of grandmothers in influencing labor force participation among mothers with young children. Our findings suggest that geographical proximity to grandmothers can substantially increase labor force participation and employment rates among mothers. The provision of free and flexible childcare by grandmothers emerged as a primary channel through which this effect operates. However, traditional gender norms and the potential need for elderly care also play crucial roles. These results underline the importance of considering family dynamics and support structures in policies aimed at increasing female labor force participation.

The third essay focused on the health outcomes of natives in Turkey in the context of the Syrian refugee crisis. Utilizing comprehensive data and robust empirical methods, we found that the influx of Syrian refugees has mixed effects on the health outcomes of native populations. While some negative impacts were observed, particularly in regions with high concentrations of refugees, these effects were not uniformly experienced across all native subgroups. The findings underscore the complexity of refugee integration and the need for targeted health interventions to mitigate potential adverse effects on host communities.

Finally, in the third essay, we investigated the impact of maternal employment on children's high school enrollment, with a specific focus on gender differences and income levels. Our results indicate that maternal employment positively influences sons' school enrollment but has no significant effect on daughters. This gender disparity suggests that while additional household income from maternal employment can support sons' education, daughters may face increased household responsibilities that offset these benefits. The impact was most pronounced in low-income households, highlighting the need for policies that address both economic and cultural barriers to education for girls.

Our findings contribute to a deeper understanding of the interplay between labor market participation, family dynamics, and socioeconomic outcomes. They highlight the importance of considering both economic and cultural factors in the design and implementation of policies aimed at promoting inclusive and sustainable development.

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APPENDICES

A. ADDITIONAL RESULTS FOR CHAPTER 2

Figure A.1: Female labor force participation in OECD countries by years

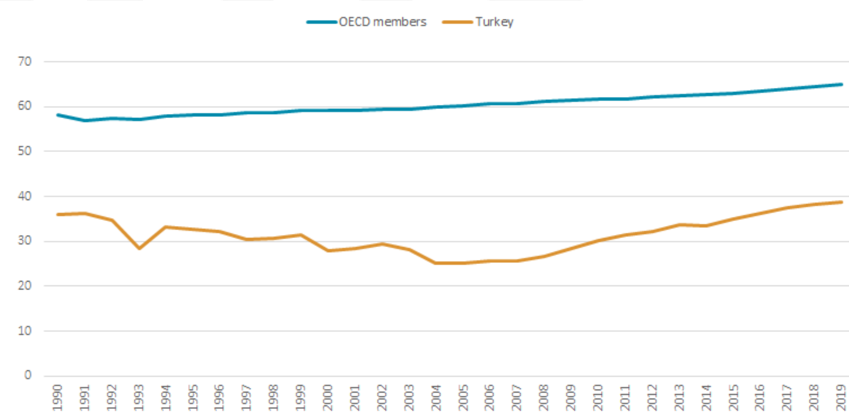


Table A.1: Family Structure Survey Micro Data Set 2016

The reason of not working	*Observations*
Couldn't find job / unemployed and looking for job	579
Seasonal working	40
Continuing to education / training	1,484
Busy with housework (including care of children, elderly, ill etc. individuals)	9,246
Retired or left the job	607
Disabled or ill (unable to work)	202
Elderly (not retired, but thinking that he/she is too old to work, 60+)	126
Income owner	2
Family and personal reasons	203
Other	35
Total	12,524

Table A.2: Effects of the number of alive grandmothers on mothers' labor market outcomes

	Dependent Variables	
	LFP	**Employment**
Number of grandmothers alive	0.031**	0.028**
	(0.013)	(0.013)
Primary education	0.036*	0.036*
	(0.019)	(0.019)
Secondary education	0.112***	0.108***
	(0.022)	(0.022)
Tertiary education	0.521***	0.514***
	(0.028)	(0.027)
Primary education (husband)	0.015	0.008
	(0.020)	(0.019)
Secondary education (husband)	-0.004	-0.003
	(0.018)	(0.018)
Tertiary education (husband)	-0.019	-0.024
	(0.022)	(0.021)
Employment (husband)	-0.062**	-0.022
	(0.025)	(0.024)
Town center	-0.004	-0.008
	(0.016)	(0.015)
Village	-0.007	-0.011
	(0.016)	(0.015)
Chronic illness	0.014	0.010
	(0.017)	(0.017)
At least one child aged 0–5	-0.083***	-0.081***
	(0.017)	(0.017)
At least one child aged 15 and above	-0.039*	-0.035*
	(0.020)	(0.020)
Number of young children	-0.024**	-0.021**
	(0.010)	(0.010)
Observations	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses.

Table A.3: Traditionality index by childhood region type

Variables	*Village Born*	*Nonvillage Born*	*Difference*	*Whole Sample*
Son preference	0.414	0.300	-0.114***	0.337
Finding women's working inappropriate	0.102	0.076	-0.026*	0.084
Interdenominational marriage is not allowed	0.605	0.469	-0.136***	0.514
Traditionality index	0.581	0.407	-0.173***	0.464
Observations	1355	2187		3542

Table A.4: Effects of grandmothers' proximity on mothers' labor force participation and employment status if unpaid family workers are included in the paid labor force and employment

	Dependent Variables			
	LFP		**Employment**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.047***	0.171**	0.050***	0.154*
	(0.015)	(0.086)	(0.015)	(0.085)
F statistic:		121.126		121.126
AR confidence set (95%)		*[0.005, 0.344]*		*[-0.012, 0.326]*
AR confidence set (90%)		*[0.032, 0.316]*		*[0.015, 0.298]*
Same town or closer				
Proximity	0.065***	0.128**	0.060***	0.115*
	(0.015)	(0.064)	(0.015)	(0.064)
F statistic:		186.531		186.531
AR confidence set (95%)		*[0.004,0.257]*		*[-0.009, 0.243]*
AR confidence set (90%)		*[0.024, 0.232]*		*[0.011, 0.218]*
Same city or closer				
Proximity	0.061***	0.124**	0.062***	0.112*
	(0.017)	(0.062)	(0.017)	(0.062)
F statistic:		213.617		213.617
AR confidence set (95%)		*[0.003,0.250]*		*[-0.009, 0.237]*
AR confidence set (90%)		*[0.023, 0.226]*		*[0.011, 0.213]*
Observations		3,542		

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean LFP and Employment is 0.304 (0.460) and 0.291 (0.454). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least one child aged 0–5, whether there is an older sibling, and the number of young children in the household. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. In columns 2 and 4, the number of alive grandmothers used as an instrument. The sample includes all married mothers aged 18–50 inclusive, with at least one child aged 0–10.

Table A.5: Descriptive statistics by the number of alive grandmothers

	Number of Alive Grandmothers		
	0	**1**	**2**
Labor force participation	0.141	0.206	0.265
	(0.350)	(0.405)	(0.441)
Employment	0.141	0.195	0.251
	(0.350)	(0.396)	(0.434)
Age	40.576	36.692	32.613
	(6.156)	(6.328)	(5.880)
Primary school or less	0.804	0.622	0.422
	(0.399)	(0.485)	(0.494)
Primary education	0.098	0.130	0.194
	(0.299)	(0.336)	(0.396)
Secondary education	0.065	0.135	0.193
	(0.248)	(0.342)	(0.395)
Tertiary education	0.033	0.112	0.190
	(0.179)	(0.316)	(0.393)
Primary school or less (husband)	0.587	0.470	0.314
	(0.495)	(0.499)	(0.464)
Primary education (husband)	0.174	0.160	0.163
	(0.381)	(0.367)	(0.369)
Secondary education (husband)	0.174	0.200	0.253
	(0.381)	(0.401)	(0.435)
Tertiary education (husband)	0.065	0.170	0.271
	(0.248)	(0.376)	(0.444)
Employed (husband)	0.804	0.882	0.927
	(0.399)	(0.323)	(0.260)
Childhood region: City center	0.261	0.331	0.382
	(0.442)	(0.471)	(0.486)
Childhood region: Town center	0.228	0.272	0.313
	(0.422)	(0.445)	(0.464)
Childhood region: Village	0.511	0.396	0.305
	(0.503)	(0.489)	(0.460)
Child aged 0–5 in the household	0.380	0.529	0.705
	(0.488)	(0.500)	(0.456)
Child aged 15 and above	0.587	0.367	0.163
	(0.495)	(0.482)	(0.369)
Number of young children	1.293	1.513	1.596
	(0.584)	(0.742)	(0.734)
Son preference	0.413	0.356	0.330
	(0.495)	(0.479)	(0.470)
Finding women's working inappropriate	0.130	0.088	0.082
	(0.339)	(0.283)	(0.274)
Interdenominational marriage is not allowed	0.620	0.507	0.512
	(0.488)	(0.500)	(0.500)
Traditionality index	0.639	0.491	0.451
	(0.563)	(0.494)	(0.465)
Lives in childhood region	0.685	0.732	0.687
	(0.467)	(0.443)	(0.464)
Lives in childhood region (husband)	0.717	0.731	0.724
	(0.453)	(0.444)	(0.447)
Only one grandfather alive	0.391	0.464	0.295
	(0.491)	(0.499)	(0.456)
Both grandfathers alive	0.120	0.331	0.645
	(0.326)	(0.471)	(0.479)
Observations	92	694	2,756

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

Table A.6: Effects of grandmothers' proximity on mothers' labor force participation and employment status

	Dependent Variables			
	LFP		**Employment**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.001	0.182**	0.004	0.164**
	(0.016)	(0.081)	(0.015)	(0.079)
F statistic:		131.100		131.100
AR confidence set (95%)		*[0.007, 0.336]*		*[-0.007, 0.314]*
AR confidence set (90%)		*[0.033, 0.309]*		*[0.019, 0.289]*
Same Town or closer				
Proximity	0.026*	0.136**	0.020	0.123**
	(0.013)	(0.061)	(0.013)	(0.059)
F statistic:		196.895		196.895
AR confidence set (95%)		*[0.001, 0.250]*		*[-0.010, 0.234]*
AR confidence set (90%)		*[0.025, 0.230]*		*[0.014, 0.215]*
Same city or closer				
Proximity	0.030*	0.132**	0.030**	0.119**
	(0.016)	(0.059)	(0.015)	(0.058)
F statistic:		216.153		216.153
AR confidence set (95%)		*[0.001, 0.243]*		*[-0.005, 0.229]*
AR confidence set (90%)		*[0.025, 0.224]*		*[0.014, 0.210]*
Observations		3,542		

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 current region-age level are given in the parentheses. Control variables are the same as the baseline.

Table A.7: Effects of grandmothers' proximity on mothers' labor market outcomes

	Dependent Variables			
	LFP		**Employment**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	0.001	0.182	0.004	0.164
	[0.952]	[0.053]	[0.732]	[0.078]
	{0.957}	{0.043}	{0.808}	{0.078}
Same town or closer				
Proximity	0.026	0.136	0.020	0.123
	[0.027]	[0.056]	[0.109]	[0.094]
	{0.102}	{0.051}	{0.153}	{0.089}
Same city or closer				
Proximity	0.030	0.132	0.030	0.119
	[0.093]	[0.058]	[0.094]	[0.084]
	{0.086}	{0.068}	{0.074}	{0.096}
Observations	3,542			

Notes: Standard errors are clustered by the NUTS-2 childhood region or age level. The wild bootstrap cluster p-values are presented in square brackets for the NUTS-2 childhood region and in curly brackets for age level. Control variables are the same as the baseline.

Table A.8: Effects of grandmothers' proximity on mothers' labor force participation

	Dependent Variable:LFP					
	District		**Town**		**City**	
	OLS	IV	OLS	IV	OLS	IV
Proximity	0.001	0.182**	0.026**	0.136**	0.030*	0.132**
	(0.013)	(0.080)	(0.013)	(0.060)	(0.015)	(0.059)
Primary education	0.037*	0.040**	0.038*	0.040**	0.037*	0.038**
	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)
Secondary education	0.114***	0.115***	0.114***	0.115***	0.114***	0.113***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Tertiary education	0.523***	0.527***	0.523***	0.522***	0.524***	0.526***
	(0.028)	(0.028)	(0.028)	(0.028)	(0.028)	(0.027)
Primary education (husband)	0.015	0.015	0.015	0.013	0.014	0.013
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Secondary education (husband)	-0.003	0.010	-0.002	0.003	-0.003	-0.002
	(0.018)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
Tertiary education (husband)	-0.016	0.022	-0.010	0.017	-0.011	0.007
	(0.022)	(0.028)	(0.022)	(0.026)	(0.022)	(0.024)
Employment (husband)	-0.060**	-0.043	-0.060**	-0.057**	-0.060**	-0.057**
	(0.025)	(0.027)	(0.025)	(0.025)	(0.025)	(0.025)
Town center	-0.004	-0.002	-0.003	0.002	-0.003	-0.002
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Village	-0.008	-0.024	-0.006	-0.001	-0.007	-0.006
	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)	(0.015)
Chronic illness	0.012	0.014	0.012	0.012	0.012	0.012
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
At least one child aged 0–5	-0.083***	-0.080***	-0.083***	-0.085***	-0.084***	-0.086***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
At least one child aged 15 and above	-0.040**	-0.046**	-0.040**	-0.039**	-0.040*	-0.037*
	(0.020)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
Number of young children	-0.023**	-0.029***	-0.023**	-0.024**	-0.023**	-0.024**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Observations			3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. Age fixed effects, dummy variables for the current region of residence and the childhood region are included, but coefficients are not reported.

Table A.9: Effects of grandmothers' proximity on mothers' employment status

	Dependent Variable:Employment					
	District		**Town**		**City**	
	OLS	IV	OLS	IV	OLS	IV
Proximity	0.004	0.164**	0.020	0.123**	0.030*	0.119**
	(0.013)	(0.079)	(0.013)	(0.060)	(0.016)	(0.058)
Primary education	0.037*	0.039**	0.037*	0.039**	0.037*	0.038**
	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)
Secondary education	0.110***	0.111***	0.110***	0.111***	0.110***	0.109***
	(0.022)	(0.023)	(0.022)	(0.022)	(0.022)	(0.022)
Tertiary education	0.516***	0.519***	0.515***	0.514***	0.516***	0.518***
	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Primary education (husband)	0.008	0.008	0.008	0.006	0.008	0.006
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Secondary education (husband)	-0.002	0.009	-0.002	0.002	-0.002	-0.002
	(0.018)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
Tertiary education (husband)	-0.021	0.013	-0.017	0.009	-0.016	0.000
	(0.021)	(0.027)	(0.022)	(0.026)	(0.021)	(0.023)
Employment (husband)	-0.021	-0.005	-0.021	-0.018	-0.020	-0.018
	(0.024)	(0.026)	(0.024)	(0.024)	(0.024)	(0.024)
Town center	-0.008	-0.007	-0.007	-0.003	-0.007	-0.006
	(0.015)	(0.016)	(0.015)	(0.016)	(0.015)	(0.015)
Village	-0.012	-0.026	-0.011	-0.006	-0.011	-0.010
	(0.015)	(0.017)	(0.015)	(0.015)	(0.015)	(0.015)
Chronic illness	0.009	0.010	0.009	0.009	0.009	0.008
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
At least1 child aged 0–5	-0.081***	-0.078***	-0.081***	-0.082***	-0.081***	-0.084***
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
At least one child aged 15 and above	-0.036*	-0.042**	-0.036*	-0.035*	-0.036*	-0.034*
	(0.020)	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
Number of young children	-0.020**	-0.025**	-0.020**	-0.021**	-0.020**	-0.021**
	(0.010)	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)
Observations			3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. Age fixed effects, dummy variables for the current region of residence and the childhood region are included, but coefficients are not reported.

Table A.10: Effect of mothers' and mothers-in-law's proximity on their daughters' labor market outcomes

	Dependent Variables			
	Mother's Proximity		**Mother-in-law's Proximity**	
	LFP	Employment	LFP	Employment
Same neighborhood/district/ district/village or closer				
Proximity	0.188*	0.173	0.083*	0.074
	(0.113)	(0.112)	(0.049)	(0.048)
F statistic:	304.828	304.828	834.768	834.768
AR confidence set(95%	*[-0.031, 0.417]*		*[-0.013, 0.179]*	
AR confidence set(90%)	*[0.004, 0.372]*		*[0.002, 0.163]*	
Same town or closer				
Proximity	0.070*	0.064	0.048*	0.043
	(0.041)	(0.041)	(0.028)	(0.028)
F statistic:	1012.518	1012.518	2467.799	2467.799
AR confidence set(95%)	*[-0.011, 0.150]*		*[-0.007, 0.103]*	
AR confidence set(90%)	*[0.002, 0.137]*		*[0.002, 0.094]*	
Same city or closer				
Proximity	0.050*	0.046	0.039*	0.034
	(0.030)	(0.029)	(0.023)	(0.023)
F statistic:	2003.992	2003.992	4857.792	4857.792
AR confidence set(95%)	*[-0.007, 0.107]*		*[-0.006, 0.084]*	
AR confidence set(90%)	*[0.002, 0.098]*		*[0.001 , 0.076]*	
Observations	3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean LFP and Employment is 0.25 (0.433) and 0.237 (0.426), respectively. Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), the childhood region (NUTS-2 level), whether self or spouse has a chronic illness, whether there is at least one child aged 0–5, whether there is an older sibling, and the number of young children in the household. In columns one and two the proximity variable is equal to one if the mother lives close and it is equal to one if the mother-in-law lives close in the third and fourth columns; otherwise, it is zero. We define two different instruments by using the information on whether maternal and paternal grandmothers are alive. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table A.11: Effects of grandmothers' proximity on the health status of the youngest or oldest child in the household

	Dependent Variable: Health Status of the Child	
	Youngest Child	Oldest Child
Same neighborhood/district/village or closer	0.008	0.009
	(0.102)	(0.102)
F statistics:	121.126	121.126
Same town or closer	0.006	0.007
	(0.076)	(0.076)
F statistics:	186.531	186.531
Same city or closer	0.006	0.007
	(0.074)	(0.074)
F statistics:	213.617	213.617
Observations	3,542	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The dependent variable is defined as the very good health status of the youngest or oldest child in the household. The mean health status of the youngest child and oldest child is 0.300 (0.458) and 0.299 (0.458), respectively. Control variables are the same as the baseline estimation. The endogenous variable is whether mother or in-law lives close. The instrumental variable is the number of grandmothers alive. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table A.12: Effects of grandmothers' proximity on labor market outcomes for different samples

	Dependent Variables	
	LFP	**Employment**
Sample 1: Same District & Another City	0.156*	0.165**
	(0.081)	(0.081)
F statistic:	97.75	
AR confidence set (95%)	*[0.005, 0.325]*	*[0.015, 0.334]*
tF confidence interval	*[-0.003, 0.314]*	*[0.007, 0.323]*
Mean dependent variable	0.235	0.223
	(0.424)	(0.417)
Observations	1,514	
Sample 2: Same Town & Another City	0.071	0.046
	(0.079)	(0.078)
F statistic:	102.5	
Mean dependent variable	0.273	0.258
	(0.446)	(0.438)
Observations	1,609	
Sample 3: Same City & Another City	0.073	0.056
	(0.102)	(0.099)
F statistic:	72.20	
Mean dependent variable	0.265	0.255
	(0.441)	(0.436)
Observations	1,221	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses.

Table A.13: Differential effects of grandmothers' proximity on mothers' labor force participation and employment status

	Dependent Variables					
	LFP			**Employment**		
	District	Town	City	District	Town	City
Analysis 1: Education level: Less than secondary						
Mother's proximity × Less than secondary	–	0.301	0.298	–	0.275	0.273
		(0.256)	(0.241)		(0.262)	(0.248)
Mother's proximity		-0.130	-0.131		-0.120	-0.120
		(0.260)	(0.243)		(0.267)	(0.250)
First-stage F-statistics:						
Mother's proximity × Less than secondary	3.50	30.97	41.96	3.50	30.97	41.96
Mother's proximity	4.12	17.97	19.44	4.12	17.97	19.44
Analysis 2: Childhood region type: Village						
Mother's proximity × Village	-0.116	-0.076	-0.093	-0.048	-0.026	-0.041
	(0.144)	(0.104)	(0.107)	(0.143)	(0.103)	(0.105)
Mother's proximity	0.236**	0.170* *	0.175**	0.187*	0.134*	0.138*
	(0.108)	(0.078)	(0.081)	(0.109)	(0.078)	(0.081)
First-stage F-statistics:						
Mother's proximity × Village	136.35	220.47	225.44	136.35	220.47	225.44
Mother's proximity	78.04	117.81	111.55	78.04	117.81	111.55
Analysis 3: Ownership status of the house: Owner						
Mother's proximity × Owner	-0.122	-0.079	-0.072	-0.136	-0.088	-0.082
	(0.187)	(0.124)	(0.122)	(0.182)	(0.121)	(0.118)
Mother's proximity	0.253*	0.182*	0.173*	0.243*	0.175*	0.166*
	(0.139)	(0.096)	(0.093)	(0.135)	(0.094)	(0.090)
First-stage F-statistics:						
Mother's proximity × Owner	102.90	181.96	190.02	102.90	181.96	190.02
Mother's proximity	47.78	72.70	87.01	47.78	72.70	87.01
Analysis 4: Age of children: Child aged 0–5						
Mother in law's proximity × Child aged 0–5	-0.128	-0.076	-0.036	-0.066	-0.036	-0.001
	(0.187)	(0.121)	(0.112)	(0.183)	(0.119)	(0.110)
Mother in law's proximity	0.259*	0.179*	0.150*	0.204	0.143	0.120
	(0.157)	(0.103)	(0.085)	(0.153)	(0.101)	(0.083)
First-stage F-statistics:						
Mother in law's proximity × Child aged 0–5	93.91	175.09	189.33	93.91	175.09	189.33
Mother in law's proximity	56.87	97.70	151.26	56.87	97.70	151.26
Observations			3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-2 childhood region-age level. Dependent variables are LFP and employment status. In the first analysis, endogenous variables are the mothers' proximity and its interaction with the presence of at least one sister. Control variables are the same as the baseline estimation, except that for this analysis we include the presence of the sister as an additional control variable. In the second analysis, endogenous variables are the mothers-in-law's proximity and its interaction with the presence of at least one sister-in-law. First-stage F-statistics are Sanderson-Windmeijer (2016) F-statistics for multiple endogenous regressors. The corresponding Stock and Yogo (2005) critical value for 10% maximal IV size is 7.03.

Table A.14: Effects of mother's labor force participation on the later death of the grandmother

	Dependent Variable: Later Death of the Grandmother
LFP	0.005
	(0.008)
Observations	3,558

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the age level are given in the parentheses. The mean of the death of grandmother is 0.039 (0.192). The regression includes age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, whether self or spouse has a chronic illness, and survey year fixed effects. The future death of the grandmother is a dummy variable equal to one if the mother or in-law died in the following years; otherwise, it is zero. The sample includes all married mothers co-residing with mother or in-law, aged 18–50 inclusive, with at least one child aged 0–10.

Table A.15: Differential effect of the number of grandmothers alive on non-college-educated daughters

	Main Effect of the Instrument	No College Degree Interaction with the Instrument	No College Degree Total Effect of the Instrument
Dependent Variables:			
LFP	-0.023	0.060	0.038***
	(0.050)	(0.051)	(0.014)
Employment	-0.017	0.050	0.033**
	(0.053)	(0.054)	(0.013)
Observations		3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-2 childhood region-age level. Dependent variables are LFP and employment status. The instrument denotes the number of grandmothers alive.

Table A.16: Effects of grandmothers' proximity on mother's labor market outcomes after dropping potentially endogenous variables

	Dependent Variables			
	LFP		**Employment**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	-0.001	0.168**	0.003	0.151*
	(0.013)	(0.080)	(0.013)	(0.080)
F statistic:		122.205		122.205
AR confidence set (95%)		*[0.018, 0.331]*		*[0.003, 0.312]*
Same town or closer				
Proximity	0.024*	0.125**	0.019	0.113*
	(0.013)	(0.060)	(0.013)	(0.060)
F statistic:		189.158		189.158
AR confidence set (95%)		*[0.013, 0.247]*		*[0.002, 0.234]*
Same city or closer				
Proximity	0.026*	0.122**	0.027*	0.110*
	(0.015)	(0.059)	(0.016)	(0.058)
F statistic:		216.981		216.981
AR confidence set (95%)		*[0.013, 0.240]*		*[0.001, 0.227]*
Observations		3,542		

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean LFP and Employment is 0.25 (0.433) and 0.237 (0.426). Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether her spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), whether self or spouse has a chronic illness. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. In columns 2, 4, and 6, the number of alive grandmothers used as an instrument. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10.

Table A.17: Effects of grandmothers' proximity on mothers' labor force participation and employment status for different sample specifications

	Dependent Variables					
	LFP			**Employment**		
	District	Town	City	District	Town	City
Cut-off age level:9	0.137*	0.102*	0.103*	0.124	0.093	0.094
	(0.078)	(0.058)	(0.059)	(0.077)	(0.058)	(0.058)
F statistic:	108.364	170.457	181.884	108.364	170.457	181.884
AR confidence set (95%)	*[-0.008, 0.295]*	*[-0.006, 0.220]*	*[-0.007, 0.223]*	*[-0.020, 0.286]*	*[-0.015, 0.209]*	*[-0.015, 0.212]*
AR confidence set (90%)	*[0.015, 0.270]*	*[0.011, 0.201]*	*[0.011, 0.204]*	*[0.004, 0.255]*	*[0.003, 0.190]*	*[0.002, 0.193]*
Mean dependent variable		0.246			0.233	
		(0.431)			(0.423)	
Observations			3,351			
Cut-off age level:11	0.219***	0.165***	0.161***	0.199***	0.150***	0.146***
	(0.076)	(0.057)	(0.056)	(0.075)	(0.057)	(0.056)
F statistic:	140.099	219.483	247.083	140.099	219.483	247.083
AR confidence set (95%)	*[0.078, 0.372]*	*[0.058, 0.281]*	*[0.056, 0.274]*	*[0.059, 0.351]*	*[0.044, 0.265]*	*[0.042, 0.259]*
Mean dependent variable		0.253			0.240	
		(0.435)			(0.427)	
Observations			3,713			
Mothers without chronic illnesses	0.185**	0.143**	0.142**	0.181**	0.141**	0.139**
	(0.084)	(0.066)	(0.066)	(0.084)	(0.066)	(0.065)
F statistic:	111.732	160.872	176.641	111.732	160.872	176.641
AR confidence set (95%)	*[0.021, 0.355]*	*[0.020, 0.277]*	*[0.019, 0.275]*	*[0.025, 0.351]*	*[0.018, 0.279]*	*[0.018, 0.271]*
Mean dependent variable		0.255			0.243	
		(0.436)			(0.429)	
Observations			3,175			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-2 childhood region-age level. Dependent variables are LFP and employment status. Control variables are the same as the baseline estimation.

Table A.18: Effects of grandmothers' proximity on mothers' labor force participation and employment status using different instrumented and instrumental variables

	Dependent Variables					
	LFP			**Employment**		
	District	Town	City	District	Town	City
Analysis 1: *Instrumented variable is equal to 1 if mother or in-law is geographically close and 2 if mother and in-law are geographically close.*						
Proximity	0.120**	0.057**	0.043**	0.109**	0.052**	0.039**
	(0.053)	(0.025)	(0.019)	(0.052)	(0.025)	(0.019)
F statistic:	197.048	646.083	1336.543	197.048	646.083	1336.543
AR confidence set (95%)	*[0.022, 0.227]*	*[0.009, 0.106]*	*[0.007, 0.080]*	*[0.011, 0.214]*	*[0.004, 0.100]*	*[0.003, 0.075]*
Chi-sq(1) P-val	–	–	–	–	–	–
Analysis 2: *Two different instruments for the mother and mother-in-law, identical instrumented variable in the baseline analysis.*						
Proximity	0.131*	0.119**	0.126**	0.117*	0.107*	0.114**
	(0.069)	(0.057)	(0.058)	(0.068)	(0.056)	(0.057)
F statistic:	85.231	98.336	104.605	85.231	98.336	104.605
Chi-sq(1) P-val	0.215	0.402	0.608	0.240	0.416	0.605
Analysis 3: *Two different instruments for the mother and mother-in-law, identical instrumented variable in analysis 1.*						
Proximity	0.101**	0.055**	0.042**	0.091*	0.050**	0.038**
	(0.049)	(0.025)	(0.019)	(0.048)	(0.025)	(0.019)
F statistic:	125.314	335.933	676.689	125.314	335.933	676.689
Chi-sq(1) P-val	0.341	0.624	0.751	0.360	0.620	0.736
Observations			3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation.

Table A.19: Effects of grandmothers' proximity on having a young child in the household

	Dependent Variables	
	Probability of having a young child	**Number of young children Number of young children**
Same neighborhood/district/village or closer	0.051	0.226
	(0.048)	(0.143)
F statistics:	448.023	122.847
Same town or closer	0.037	0.170
	(0.035)	(0.108)
F statistics:	741.211	187.426
Same city or closer	0.035	0.166
	(0.033)	(0.105)
F statistics:	844.364	214.642
Observations	6,051	3,542

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean of having a young child is 0.585 (0.493). The mean number of total children is 1.572 (0.734). In the first column, regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), whether self or spouse has a chronic illness. The dependent variable is a dummy variable equal to one if the woman has a young child, and zero otherwise. In the second column, the model includes additional control variables: whether there is at least one child aged 0–5 and whether these is an older sibling. The dependent variable is equal to the total number of young children. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. The number of alive grandmothers used as an instrument. In the first analysis, the sample includes all married women aged 18–50 inclusive with children or no children. In the second analysis, it includes all married mothers, aged 18–50, with at least one child aged 0–10.

A.1. Potential Violation of the Exclusion Restriction

We employ two strategies to assess the sensitivity of the IV estimates to violations of the exclusion restriction: the imperfect instrumental variable (IIV) method proposed by Nevo & Rosen (2012) and the plausible exogeneity test by Conley et al. (2012).

Nevo & Rosen (2012)

The implementation of Nevo & Rosen (2012)'s method requires that the correlation between the instrumental variable and the error term be in the same direction as the correlation between the original endogenous regressor and the error term (Assumption 3 in Nevo & Rosen 2012). Therefore, we multiply the proximity variable by -1 so that this assumption is satisfied. Traditional women tend to live close but stay out of the labor market; therefore, $\rho_{xu} > 0$. Women whose mothers die earlier might come from poorer socioeconomic backgrounds. Women from lower socioeconomic backgrounds work less if they have fewer skills and education. That is, they are less likely to work and have a mother or in-law who is still alive, so $\rho_{zu} > 0$.

It is implausible to expect that the death of grandmother is even more endogenous than our endogenous variable (proximity). As a result, we expect the instruments to have lower correlation with the error term than the original endogenous variable (Assumption 4 in Nevo & Rosen 2012). Using the constructed IV by Nevo & Rosen (2012)'s approach for each definition of proximity variable, the estimated effects of proximity on labor force participation are as follows:

- The coefficient of proximity_district is statistically insignificant and between

0.026 and 0.182 (with a confidence interval of -0.007 and 0.339).

- The coefficient of proximity_town is statistically significant and between 0.046 and 0.136 (with a confidence interval of 0.014 and 0.254).
- The coefficient of proximity_city is statistically significant and between 0.051 and 0.132 (with a confidence interval of 0.013 and 0.247).

Using the constructed IV by Nevo & Rosen (2012)'s approach for each definition of proximity variable, the estimates of the effects of proximity on employment are as follows:

- The coefficient of proximity_district is statistically insignificant and between 0.026 and 0.164 (with a confidence interval of -0.006 and 0.320).
- The coefficient of proximity_town is statistically significant and between 0.039 and 0.123 (with a confidence interval of 0.007 and 0.239).
- The coefficient of proximity_city is statistically significant and between 0.049 and 0.119 (with a confidence interval of 0.011 and 0.233).

For each definition of proximity variable, the IV estimates are located in the confidence intervals for labor force participation and employment as outcome variables. Thus, the IIV method confirms the robustness of our IV estimation results.

Conley et al. (2012)

We examine the possibility that the instrument may have a direct effect on the probability of women being in the labor force or being employed. We apply the plausibly exogenous technique by Conley et al. (2012) to show how large a potential direct effect of the instrument can be in order to turn the 2SLS estimate of labor force participation and employment outcomes insignificant. According to Conley et al. (2012)'s approach, in the following regression

$$Y = X\beta + Z\gamma + \epsilon \, ,$$

where Y is an outcome vector, X is a matrix of endogenous treatment variables, ϵ are unobservables, and Z is a matrix of instruments assumed to be uncorrelated with ϵ, for the exclusion restriction to be satisfied, γ needs to be identically 0.

We estimate the direct effect of the number of grandmothers alive on the labor market status and impose that the support of the direct effect γ is in the interval [0,δ], with $\delta > 0$. Then, we report the 90% confidence intervals (black dashed lines) for the second-stage estimates of proximity variables for labor market status using the union of confidence intervals (UCI) approach. We present the results in Figures Figure A.2 and A.3 for labor force participation and employment as outcome variables, respectively, which show the threshold at which the estimated 2SLS coefficient of the endogenous variable becomes statistically insignificant at the 10% level.

For the endogenous variable of living in the same district or closer to grandmothers, the direct effect on labor force participation would turn the second-stage effect insignificant at $\delta \approx 0.08$ (δ corresponding to the intersection of the zero line (red) with the dashed lower-bound of the confidence interval). That is, our 2SLS estimates on labor market outcomes are significant as long as some omitted factors that are also captured by the number of alive grandmothers explain less than a quarter of the overall reduced form effect (25% (0.008/0.031)). In all figures, we show the overall reduced form effects with a vertical green line. For the second and third definitions of proximity variables, the omitted variable that is also captured by the number of grandmothers alive needs to be less than about 23% (0.007/0.031) of the overall reduced form effect and 23% (0.007/0.031) in Figure A.2 to depict our 2SLS estimates as significant. Similarly, Figure A.3 shows how large the omitted variable should be to render 2SLS estimates insignificant for the employment outcome, and the results are similar. Therefore, these results show that our main results are robust to the violation of the exclusion restriction to some extent.

Figure A.2: Plausibly exogenous technique (LFP)

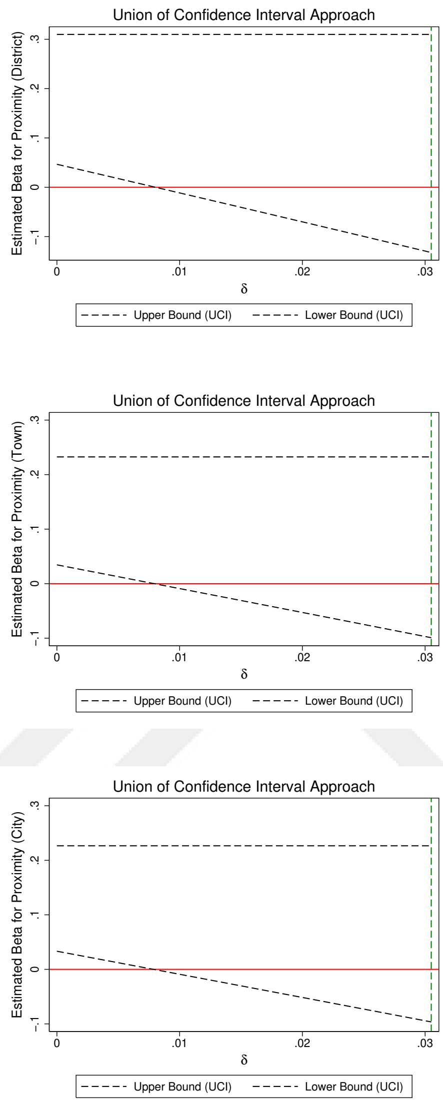
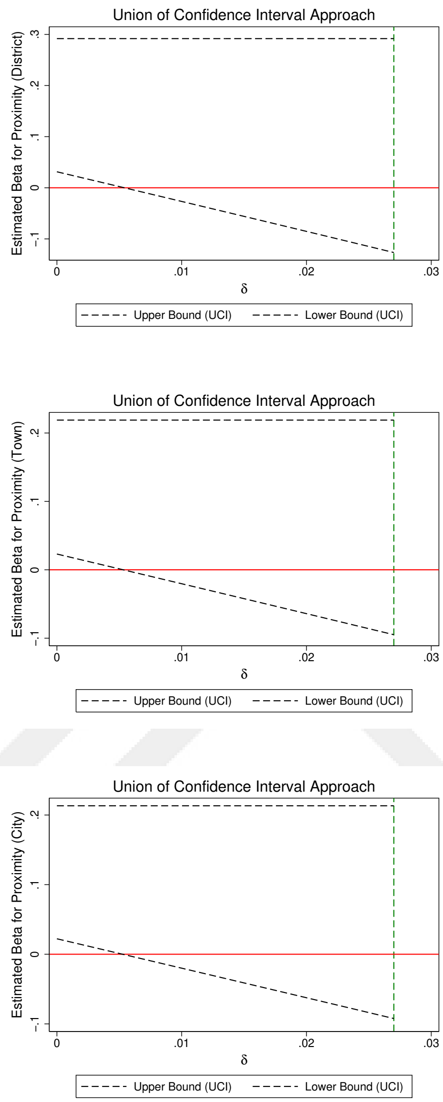


Figure A.3: Plausibly exogenous technique (Employment)



B. ADDITIONAL RESULTS FOR CHAPTER 3

Table B.1: Descriptive statistics by the number of alive grandmothers

	Number of Alive Grandmothers		
	0	**1**	**2**
Labor force participation	0.141	0.206	0.265
	(0.350)	(0.405)	(0.441)
Employment	0.141	0.195	0.251
	(0.350)	(0.396)	(0.434)
Age	40.576	36.692	32.613
	(6.156)	(6.328)	(5.880)
Primary school or less	0.804	0.622	0.422
	(0.399)	(0.485)	(0.494)
Primary education	0.098	0.130	0.194
	(0.299)	(0.336)	(0.396)
Secondary education	0.065	0.135	0.193
	(0.248)	(0.342)	(0.395)
Tertiary education	0.033	0.112	0.190
	(0.179)	(0.316)	(0.393)
Primary school or less (husband)	0.587	0.470	0.314
	(0.495)	(0.499)	(0.464)
Primary education (husband)	0.174	0.160	0.163
	(0.381)	(0.367)	(0.369)
Secondary education (husband)	0.174	0.200	0.253
	(0.381)	(0.401)	(0.435)
Tertiary education (husband)	0.065	0.170	0.271
	(0.248)	(0.376)	(0.444)
Employed (husband)	0.804	0.882	0.927
	(0.399)	(0.323)	(0.260)
Childhood region: City center	0.261	0.331	0.382
	(0.442)	(0.471)	(0.486)
Childhood region: Town center	0.228	0.272	0.313
	(0.422)	(0.445)	(0.464)
Childhood region: Village	0.511	0.396	0.305
	(0.503)	(0.489)	(0.460)
Child aged 0–5 in the household	0.380	0.529	0.705
	(0.488)	(0.500)	(0.456)
Child aged 15 and above	0.587	0.367	0.163
	(0.495)	(0.482)	(0.369)
Number of young children	1.293	1.513	1.596
	(0.584)	(0.742)	(0.734)
Son preference	0.413	0.356	0.330
	(0.495)	(0.479)	(0.470)
Finding women's working inappropriate	0.130	0.088	0.082
	(0.339)	(0.283)	(0.274)
Interdenominational marriage is not allowed	0.620	0.507	0.512
	(0.488)	(0.500)	(0.500)
Traditionality index	0.639	0.491	0.451
	(0.563)	(0.494)	(0.465)
Lives in childhood region	0.685	0.732	0.687
	(0.467)	(0.443)	(0.464)
Lives in childhood region (husband)	0.717	0.731	0.724
	(0.453)	(0.444)	(0.447)
Only one grandfather alive	0.391	0.464	0.295
	(0.491)	(0.499)	(0.456)
Both grandfathers alive	0.120	0.331	0.645
	(0.326)	(0.471)	(0.479)
Observations	92	694	2,756

Source: Family Structure Survey Micro Data Set 2016. The standard deviations are presented in parentheses.

Table B.2: Descriptive statistics for the complier and non-complier subpopulations

	District			**Town**			**City**		
	Whole	Compliers	Never Takers	Whole	Compliers	Never Takers	Whole	Compliers	Never Takers
Age	33.619	33.290	33.814	33.619	33.348	34.175	33.619	33.527	33.996
	(0.105)	(0.181)	(0.131)	(0.105)	(0.125)	(0.188)	(0.108)	(0.120)	(0.243)
Primary school or less	0.471	0.567	0.414	0.471	0.503	0.405	0.471	0.493	0.381
	(0.008)	(0.014)	(0.010)	(0.008)	(0.010)	(0.014)	(0.008)	(0.009)	(0.018)
Primary education	0.179	0.192	0.172	0.179	0.184	0.169	0.179	0.182	0.168
	(0.006)	(0.011)	(0.008)	(0.006)	(0.008)	(0.011)	(0.006)	(0.007)	(0.014)
Secondary education	0.179	0.151	0.195	0.179	0.173	0.190	0.179	0.179	0.178
	(0.006)	(0.010)	(0.009)	(0.006)	(0.008)	(0.011)	(0.006)	(0.007)	(0.015)
Tertiary education	0.171	0.090	0.220	0.171	0.139	0.236	0.171	0.146	0.273
	(0.006)	(0.008)	(0.009)	(0.006)	(0.007)	(0.013)	(0.006)	(0.007)	(0.017)
Primary school or less(husb.)	0.351	0.443	0.297	0.351	0.382	0.290	0.351	0.370	0.277
	(0.008)	(0.014)	(0.010)	(0.008)	(0.010)	(0.014)	(0.008)	(0.009)	(0.017)
Primary edu.(husb.)	0.163	0.204	0.138	0.163	0.184	0.120	0.163	0.176	0.108
	(0.006)	(0.011)	(0.008)	(0.006)	(0.008)	(0.009)	(0.006)	(0.007)	(0.012)
Secondary edu.(husb.)	0.240	0.234	0.244	0.240	0.254	0.212	0.240	0.254	0.184
	(0.007)	(0.012)	(0.009)	(0.007)	(0.009)	(0.012)	(0.007)	(0.008)	(0.015)
Tertiary edu.(husb.)	0.246	0.119	0.321	0.246	0.181	0.379	0.246	0.200	0.431
	(0.007)	(0.010)	(0.010)	(0.007)	(0.008)	(0.015)	(0.007)	(0.008)	(0.018)
Employment(husb.)	0.915	0.878	0.937	0.915	0.904	0.937	0.915	0.907	0.950
	(0.005)	(0.009)	(0.005)	(0.005)	(0.006)	(0.007)	(0.005)	(0.006)	(0.008)
Village	0.328	0.426	0.270	0.328	0.336	0.313	0.328	0.335	0.299
	(0.008)	(0.014)	(0.010)	(0.008)	(0.010)	(0.013)	(0.008)	(0.009)	(0.017)
Chronic illness	0.185	0.199	0.177	0.185	0.191	0.174	0.185	0.191	0.164
	(0.006)	(0.011)	(0.008)	(0.007)	0.008)	(0.011)	(0.007)	(0.007)	(0.014)
At least one child	0.662	0.658	0.665	0.662	0.670	0.646	0.662	0.668	0.637
aged 0–5	(0.008)	(0.013)	(0.010)	(0.008)	(0.009)	(0.014)	(0.008)	(0.009)	(0.019)
At least one child	0.214	0.237	0.201	0.214	0.213	0.216	0.214	0.214	0.212
aged 15 and above	(0.007)	(0.012)	(0.009)	(0.007)	(0.009)	(0.012)	(0.007)	(0.008)	(0.016)
Number of young	1.572	1.637	1.533	1.572	1.593	1.528	1.572	1.588	1.506
children	(0.012)	(0.022)	(0.015)	(0.013)	(0.016)	(0.020)	(0.013)	(0.014)	(0.026)
Having son preference	0.337	0.415	0.291	0.337	0.352	0.306	0.337	0.341	0.322
	(0.008)	(0.015)	(0.009)	(0.008)	(0.010)	(0.014)	(0.008)	(0.009)	(0.018)
Finding women's working	0.084	0.091	0.080	0.084	0.088	0.077	0.084	0.086	0.077
inappropriate	(0.005)	(0.008)	(0.006)	(0.004)	(0.005)	(0.008)	(0.005)	(0.005)	(0.010)
Interdenominational marriage is	0.514	0.562	0.485	0.514	0.524	0.492	0.514	0.519	0.491
not allowed	(0.008)	(0.014)	(0.011)	(0.008)	(0.010)	(0.014)	(0.009)	(0.010)	(0.019)
Traditionality index	0.464	0.554	0.411	0.464	0.487	0.417	0.464	0.472	0,432
	(0.008)	(0.014)	(0.009)	(0.008)	(0.010)	(0.013)	(0.008)	(0.008)	(0.018)
Lives in hometown	0.695	0.813	0.625	0.695	0.811	0.457	0.695	0.803	0.257
	(0.008)	(0.011)	(0.011)	(0.008)	(0.008)	(0.015)	(0.008)	(0.008)	(0.017)
Live in husband's	0.725	0.846	0.653	0.725	0.837	0.495	0.725	0.827	0.308
hometown	(0.008)	(0.011)	(0.011)	(0.008)	(0.008)	(0.015)	(0.008)	(0.007)	(0.017)
Only one grandfather	0.330	0.345	0.322	0.330	0.329	0.332	0.330	0.328	0.339
is alive	(0.008)	(0.013)	(0.010)	(0.008)	(0.010)	(0.014)	(0.008)	(0.009)	(0,019)
Both grandfathers	0.570	0.527	0.595	0.570	0.566	0.578	0.570	0.568	0.577
are alive	(0.008)	(0.014)	(0.011)	(0.008)	(0.010)	(0.015)	(0.009)	(0.009)	(0.019)
Proportions	1	0.373	0.627	1	0.673	0.327	1	0.803	0.197

Notes:Bootstrapped standard errors are given in the parentheses.

Table B.3: First-stage regression for various subgroups

	Distrisct		**Town**		**City**	
	Age≤35	Age>35	Age≤35	Age>35	Age≤35	Age>35
Instrument	0.184***	0.170***	0.214***	0.249***	0.176***	0.277***
	(0.024)	(0.020)	(0.026)	(0.020)	(0.025)	(0.019)
Observation	2187	1355	2187	1355	2187	1355
	Primary educ. or less	Secondary educ. or above	Primary educ. or less	Secondary educ. or above	Primary educ. or less	Secondary educ. or above
Instrument	0.199***	0.078***	0.250***	0.159***	0.253***	0.170***
	(0.018)	(0.028)	(0.018)	(0.036)	(0.016)	(0.035)
Observation	2303	1239	2303	1239	2303	1239
	Primary educ. or less(husb)	Secondary educ. or above(husb)	Primary educ. or less(husb)	Secondary educ. or above(husb)	Primary educ. or less(husb)	Secondary educ or above(husb)
Instrument	0.193***	0.133***	0.243***	0.197***	0.255***	0.192***
	(0.020)	(0.024)	(0.020)	(0.029)	(0.018)	(0.027)
Observation	1821	1721	1821	1721	1821	1721
	Born in village	Born in center	Born in village	Born in center	Born in village	Born in center
Instrument	0.192***	0.150***	0.254***	0.216***	0.256***	0.211***
	(0.027)	(0.019)	(0.026)	(0.021)	(0.024)	(0.020)
Observation	1162	2380	1162	2380	1162	2380
	Child aged below 6	No child aged below 6	Child aged below 6	No child aged below 6	Child aged below 6	No child aged below 6
Instrument	0.179***	0.152***	0.228***	0.223***	0.200***	0.268***
	(0.022)	(0.023)	(0.023)	(0.024)	(0.022)	(0.022)
Observation	2345	1197	2345	1197	2345	1197
	Older Sibling	No older sibling	Older sibling	No older sibling	Older sibling	No older sibling
Instrument	0.171***	0.164***	0.246***	0.207***	0.286***	0.201***
	(0.026)	(0.019)	(0.025)	(0.022)	(0.024)	(0.021)
Observation	758	2784	758	2784	758	2784
	Few child.	Many child.	Few child.	Many child.	Few child.	Many child.
Instrument	0.168***	0.188***	0.232***	0.169***	0.238***	0.164***
	(0.016)	(0.070)	(0.017)	(0.057)	(0.016)	(0.052)
Observation	3165	377	3165	377	3165	377
	Son pref.	No son pref.	Son pref.	No son pref.	Son pref.	No son pref.
Instrument	0.221***	0.142***	0.269***	0.206***	0.275***	0.209***
	(0.027)	(0.018)	(0.027)	(0.020)	(0.025)	(0.020)
Observation	1194	2348	1194	2348	1194	2348
	Women can work	Women can not work	Women can work	Women can not work	Women can work	Women can not work
Instrument	0.206***	0.163***	0.295***	0.218***	0.272***	0.226***
	(0.057)	(0.016)	(0.054)	(0.017)	(0.052)	(0.017)
Observation	298	3244	298	3244	298	3244
	Interdenominational marriage not allowed	Interdenominational marriage allowed	Interdenominational marriage not allowed	Interdenominational marriage allowed	Interdenominational marriage not allowed	Interdenominational marriage allowed
Instrument	0.177***	0.156***	0.254***	0.194***	0.250***	0.215***
	(0.021)	(0.022)	(0.023)	(0.024)	(0.022)	(0.024)
Observation	1819	1723	1819	1723	1819	1723

Table B.3 (cont'd)

	Conservative	Nonconservative	Conservative	Nonconservative	Conservative	Nonconservative
Instrument	0.211***	0.137***	0.266***	0.198***	0.275***	0.201***
	(0.025)	(0.019)	(0.025)	(0.021)	(0.023)	(0.021)
Observation	1355	2187	1355	2187	1355	2187
	Live in home town	Do not live in home town	Live in home town	Do not live in home town	Live in home town	Do not live in home town
Instrument	0.184***	0.130***	0.231***	0.211***	0.214***	0.273***
	(0.019)	(0.023)	(0.019)	(0.028)	(0.018)	(0.028)
Observation	2463	1079	2463	1079	2463	1079
	Live in husb. home town	Do not live in husb. home town	Live in husb. home town	Do not live in husb. home town	Live in husb. home town	Do not live in husb. home town
Instrument	0.192***	0.093***	0.243***	0.167***	0.227***	0.230***
	(0.019)	(0.024)	(0.019)	(0.032)	(0.017)	(0.031)
Observation	2569	973	2569	973	2569	973

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. The sample includes all married mothers, aged 18–50 inclusive, with at least one child aged 0–10. Few children corresponds to 2 children or less.

Table B.4: Effects of the number of alive grandparents on mothers' and fathers' labor market outcomes

	Dependent Variables					
	LFP	Employment	LFP	Employment	LFP	Employment
Groups:						
Women without young children:						
Number of grandmothers alive	0.016	0.014				
	(0.013)	(0.013)				
Fathers with young children:						
Number of grandmothers alive			-0.000	0.005		
			(0.005)	(0.010)		
Mothers with young children:						
Number of grandfathers alive					0.009	0.009
					(0.010)	(0.010)
Observations	2,509		3,408		3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-2 childhood region-age level. Control variables are the same as the baseline estimation. For the first four columns, the independent variable is the number of grandmothers alive. For the fifth and sixth columns, the independent variable is the number of grandfathers alive. The results of the sample of married women with children aged 11 and older or no children are presented in columns one and two. The results of the sample of fathers with children aged 10 and younger are presented in the third and fourth columns. The last two columns consider married women with young children.

Table B.5: Effects of grandmothers' proximity on stating childcare and household chores as a reason for not working

	Dependent Variable: Not Working as she is busy with childcare and household chores			
	Mothers with young children		**Women without young children**	
	(OLS)	(IV)	(OLS)	(IV)
Same neighborhood/district/village or closer				
Proximity	-0.045***	-0.204**	-0.089***	-0.071
	(0.015)	(0.086)	(0.021)	(0.069)
F statistic:		121.126		321.186
AR confidence set(95%)		*[-0.378, -0.037]*		
Same town or closer				
Proximity	-0.072***	-0.153**	-0.051***	-0.050
	(0.014)	(0.064)	(0.019)	(0.049)
F statistic:		186.531		620.949
AR confidence set(95%)		*[-0.282, -0.028]*		
Same city or closer				
Proximity	-0.068***	-0.148**	-0.071***	-0.047
	(0.017)	(0.063)	(0.022)	(0.046)
F statistic:		213.617		812.586
AR confidence set(95%)		*[-0.275, -0.027]*		
Observations	3,542		2,509	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean 'Not Working' is 0.684 (0.465) and 0.564 (0.496) for the group of mothers with young children and women without young children, respectively. Regressions include age fixed effects, education categories for both spouses (less than primary education (omitted), primary, secondary, and tertiary education), whether spouse works, the current region of residence (NUTS-1 level), type of childhood settlement (city center (omitted), town center, or village), whether self or spouse has a chronic illness. The proximity variable is a dummy variable equal to one if the mother or in-law lives close; otherwise, it is zero. In columns 2 and 4, the number of alive grandmothers is used as an instrument. The sample includes all married mothers aged 18–50 inclusive, with at least one child aged 0–10.

Table B.6: Traditionality index by childhood region type

Variables	*Village Born*	*Nonvillage Born*	*Difference*	*Whole Sample*
Son preference	0.414	0.300	-0.114***	0.337
Finding women's working inappropriate	0.102	0.076	-0.026*	0.084
Interdenominational marriage is not allowed	0.605	0.469	-0.136***	0.514
Traditionality index	0.581	0.407	-0.173***	0.464
Observations	1355	2187		3542

Table B.7: Differential effects of mothers and mothers in law's proximity on measures of traditionality

	District	Town	City
Dependent Variables:			
Having son preference			
Mother	-0.007	-0.003	-0.002
	(0.151)	(0.056)	(0.040)
Mother-in-law	0.062	0.036	0.029
	(0.064)	(0.037)	(0.030)
Finding women's working inappropriate			
Mother	0.096	0.035	0.025
	(0.084)	(0.031)	(0.022)
Mother-in-law	-0.009	-0.005	-0.004
	(0.040)	(0.023)	(0.019)
Interdenominational marriage is not allowed			
Mother	0.354**	0.131**	0.094**
	(0.163)	(0.061)	(0.044)
AR confidence set (95%)	*[0.038, 0.670]*	*[0.013, 0.249]*	*[0.009, 0.179]*
Mother-in-law	0.032	0.018	0.015
	(0.069)	(0.040)	(0.032)
Traditionality index			
Mother	0.033	0.012	0.009
	(0.157)	(0.058)	(0.042)
Mother-in-law	0.034	0.019	0.016
	(0.064)	(0.037)	(0.030)
Observations		3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. Control variables are the same as the baseline estimation. Endogenous variables are mothers' proximity or mother-in-law's proximity. Instruments are the presence of mother or mother-in-law. The first-stage F-statistics are above 104.7.

Table B.8: Effects of grandmothers' proximity on the indicators of traditionality for different sample specifications in terms of the age of the youngest child in the household

	Dependent Variables	
	Traditionality Index	**Finding Women's Working Inappropriate**
Same neighborhood/ district/village or closer		
Mothers' proximity × child aged 0–5 years	0.456**	0.079
	(0.219)	(0.132)
Mothers' proximity	-0.224	-0.002
	(0.168)	(0.104)
First-stage F-statistics:		
Mothers' proximity × child aged 0–5 years	111.31	
Mothers' proximity	46.11	
Same town or closer		
Mothers' proximity × child aged 0–5 years	0.337**	0.062
	(0.159)	(0.096)
Mothers' proximity	-0.153	-0.002
	(0.113)	(0.071)
First-stage F-statistics:		
Mothers' proximity × child aged 0–5 years	181.44	
Mothers' proximity	89.59	
Same city or closer		
Mothers' proximity × child aged 0–5 years	0.337**	0.070
	(0.160)	(0.094)
Mothers' proximity	-0.127	-0.001
	(0.094)	(0.059)
First-stage F-statistics:		
Mothers' proximity × child aged 0–5 years	222.72	
Mothers' proximity	148.90	
Observations	3,542	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean Traditionality Index and Finding Women's Working Inappropriate is 0.456 (0.469) and 0.084 (0.277) for the group of women with very young children and 0.479 (0.485) and 0.085 (0.279) for the counter group. First-stage F-statistics are Sanderson-Windmeijer (2016) F-statistics for multiple endogenous regressors. The corresponding Stock and Yogo (2005) critical value for 10% maximal IV size is 7.03.

Table B.9: Effects of grandmothers' proximity on labor market status for the subgroup of women who do not reside with their parents

	Dependent Variables	
	LFP	**Employment**
Analysis 1: Same District	0.220**	0.182*
	(0.103)	(0.103)
F statistic:	81.651	
AR confidence set (95%)	*[0.029, 0.436]*	*[-0.009, 0.398]*
AR confidence set (90%)	*[0.060, 0.395]*	*[0.022, 0.356]*
tF confidence interval	*[0.014, 0.427]*	*[-0.024, 0.388]*
Analysis 2: Same Town	0.141**	0.117*
	(0.066)	(0.066)
F statistic:	152.508	
AR confidence set (95%)	*[0.019, 0.274]*	*[-0.006, 0.250]*
AR confidence set (90%)	*[0.039, 0.253]*	*[0.014, 0.228]*
Analysis 3: Same City	0.129**	0.107*
	(0.060)	(0.060)
F statistic:	196.077	
AR confidence set (95%)	*[0.017, 0.251]*	*[-0.005, 0.228]*
AR confidence set (90%)	*[0.035, 0.231]*	*[0.013, 0.209]*
Observations	3,154	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-2 childhood region-age level are given in the parentheses. The mean LFP and Employment is 0.263 (0.440) and 0.250 (0.433).

B.1. Elderly Care Channel

We investigate whether the proximity of grandmothers' proximity affects mothers' labor market outcomes through the elderly care channel by implementing two different analyses. In our first analysis, we focus on the differential effect of grandmothers' proximity on women with at least one surviving sister or sister-in-law.[1] That is, we implement regression analysis in which we include the original proximity variable and its interaction with the presence of a sister (in-law) as endogenous variables. By doing so, we aim to understand if the positive effects of living close to grandmothers differ depending on the availability of a sister or sister-in-law. More specifically, we define a binary variable 'Sister (Sister-in-Law)' that equals one if the individual has at least one surviving sister (sister-in-law). The instrumental variables we use are the dummy variable indicating whether the mother (mother-in-law) is alive and its interaction with the 'Sister (Sister-in-Law)' variable.

In Table B.10, we present these results for labor market outcomes in the total, village, and non-village samples. The results in the first three panels, which are for the own mother and sister, show that the coefficients of the interaction term are insignificant but positive for the total, village, and non-village samples. The positive coefficients on the interaction term suggest that the presence of at least one sister amplifies the impact of grandmothers' proximity on mothers' labor force participation and employment rates. This result might be attributed to sisters' help with elderly care or childcare. However, when we examine the effects of the

[1] In our data, we do not observe information on the number of siblings or whether the sibling is older or younger. We only have the information on whether the woman or her husband has at least one sister or brother and if they live close by. That is, if a woman states that she lives far away from her sister, she might have another sister living nearby who is not mentioned in the questionnaire. Therefore, heterogeneity based on siblings' proximity will be problematic. Additionally, we lack information regarding grandparents' health and whether women provide elder care to them, unless they live in the same household.

mother-in-law's proximity in the presence of at least one sister-in-law, as presented in the last three panels, the coefficients are negative and significant. This suggests that women with at least one sister-in-law are less likely to benefit from their mother-in-law's proximity to join the labor market. If mother-in-law's proximity affects mothers' labor supply through the elderly care channel, women with at least one sister-in-law would share the burden of elderly care and provide fewer hours of care, leading to fewer caregiving hours and increased labor supply for women. Overall, these results do not provide evidence that the proximity of grandmothers affects daughters' LFP through the elderly care channel.

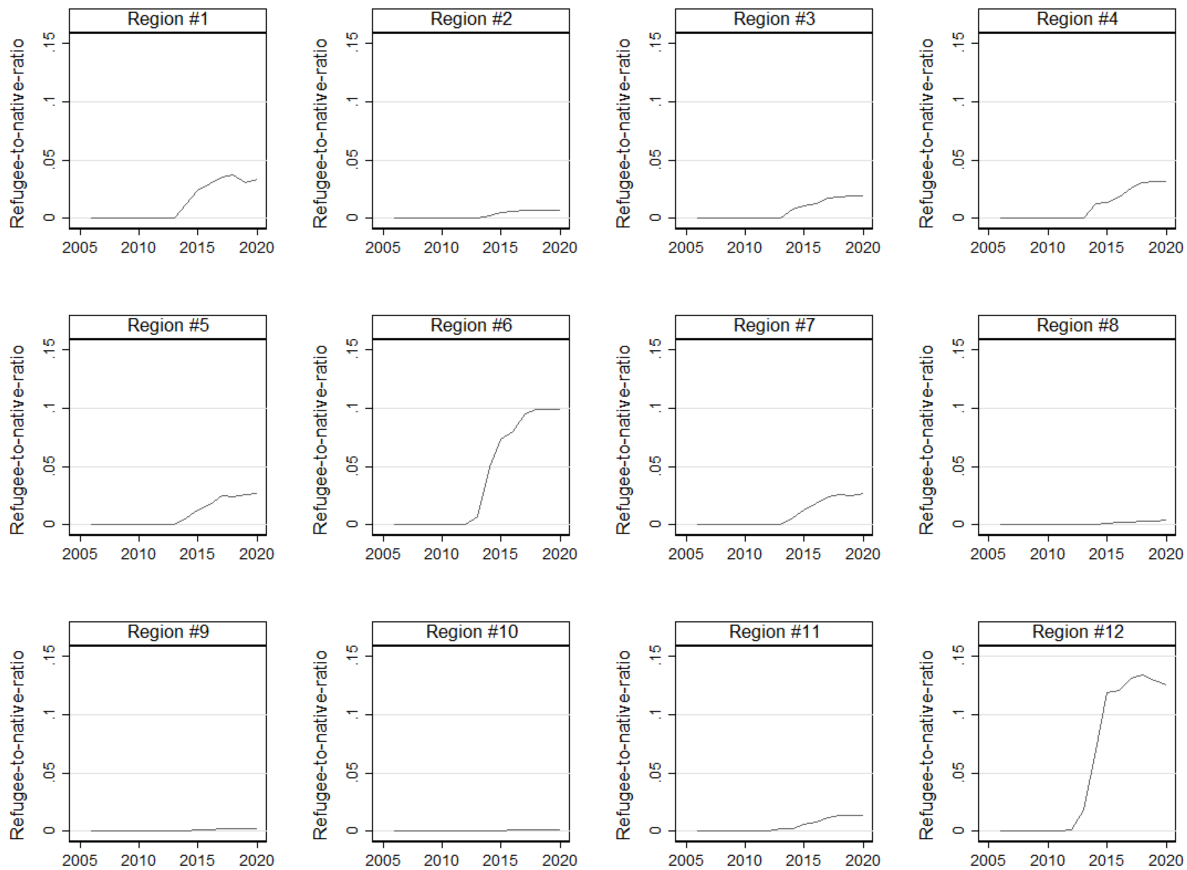
Table B.10: Differential effects of grandmothers' proximity on mothers' labor force participation and employment status for the group of women with sisters or sisters-in-law

	Dependent Variables					
	LFP			**Employment**		
	District	Town	City	District	Town	City
Total Sample						
Mother's proximity × Sister	0.158	0.055	0.036	-0.024	-0.014	-0.013
	(0.314)	(0.119)	(0.086)	(0.297)	(0.112)	(0.080)
Mothers' proximity	0.060	0.023	0.019	0.193	0.076	0.057
	(0.284)	(0.111)	(0.081)	(0.264)	(0.103)	(0.075)
First-stage F-statistics:						
Proximity	142.98	593.88	1228.47	142.98	593.88	1228.47
Proximity × Sister	254.39	1058.97	2190.39	254.39	1058.97	2190.39
Village Sample						
Mothers' proximity × Sister	0.128	0.060	0.043	-0.203	-0.094	-0.069
	(0.428)	(0.200)	(0.144)	(0.379)	(0.177)	(0.126)
Mothers' proximity	-0.089	-0.043	-0.031	0.203	0.094	0.071
	(0.402)	(0.186)	(0.139)	(0.348)	(0.160)	(0.119)
First-stage F-statistics:						
Proximity	43.91	167.14	359.70	43.91	167.14	359.70
Proximity × Sister	97.82	271.48	559.33	97.82	271.48	559.33
Non-Village Sample						
Mothers' proximity × Sister	0.129	0.015	0.006	0.134	0.020	0.011
	(0.413)	(0.146)	(0.104)	(0.410)	(0.144)	(0.103)
Mothers' proximity	0.350	0.123	0.093	0.289	0.101	0.076
	(0.375)	(0.138)	(0.099)	(0.370)	(0.136)	(0.098)
First-stage F-statistics:						
Proximity	82.17	409.57	843.42	82.17	409.57	843.42
Proximity × Sister	139.67	654.00	1370.25	139.67	654.00	1370.25
Total Sample						
Mother in law's proximity × Sister in law	-0.492**	-0.218**	-0.166**	-0.487**	-0.216**	-0.165**
	(0.200)	(0.090)	(0.068)	(0.197)	(0.088)	(0.067)
Mother in law's proximity	0.525***	0.240***	0.185***	0.511***	0.233***	0.180***
	(0.192)	(0.085)	(0.065)	(0.189)	(0.084)	(0.064)
First-stage F-statistics:						
Proximity	156.96	617.51	1393.84	156.96	617.51	1393.84
Proximity × Sister in law	251.23	1146.37	2680.84	251.23	1146.37	2680.84
Village Sample						
Mother in law's proximity × Sister in law	-0.436**	-0.232**	-0.189**	-0.456**	-0.241**	-0.197**
	(0.217)	(0.117)	(0.094)	(0.228)	(0.122)	(0.099)
Mother in law's proximity	0.470**	0.259**	0.213**	0.497**	0.274**	0.225**
	(0.206)	(0.109)	(0.089)	(0.218)	(0.116)	(0.094)
First-stage F-statistics:						
Proximity	64.06	234.12	468.13	64.06	234.12	468.13
Proximity × Sister in law	96.83	399.02	819.19	96.83	399.02	819.19
Non-Village Sample						
Mother in law's proximity × Sister in law	-0.594**	-0.253**	-0.189**	-0.572**	-0.246**	-0.185**
	(0.278)	(0.116)	(0.087)	(0.272)	(0.114)	(0.085)
Mother in law's proximity	0.572**	0.243**	0.182**	0.527**	0.224**	0.169**
	(0.269)	(0.111)	(0.083)	(0.262)	(0.109)	(0.081)
First-stage F-statistics:						
Proximity	101.10	456.37	960.59	101.10	456.37	960.59
Proximity × Sister in law	177.83	805.69	1862.71	177.83	805.69	1862.71
Observations			3,542			

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-2 childhood region-age level. Dependent variables are LFP and employment status. In the first analysis, endogenous variables are the mothers' proximity and its interaction with the presence of at least one sister. Control variables are the same as the baseline estimation, except that for this analysis we include the presence of the sister as an additional control variable. In the second analysis, endogenous variables are the mothers-in-law's proximity and its interaction with the presence of at least one sister-in-law. First-stage F-statistics are Sanderson-Windmeijer (2016) F-statistics for multiple endogenous regressors. The corresponding Stock and Yogo (2005) critical value for 10% maximal IV size is 7.03.

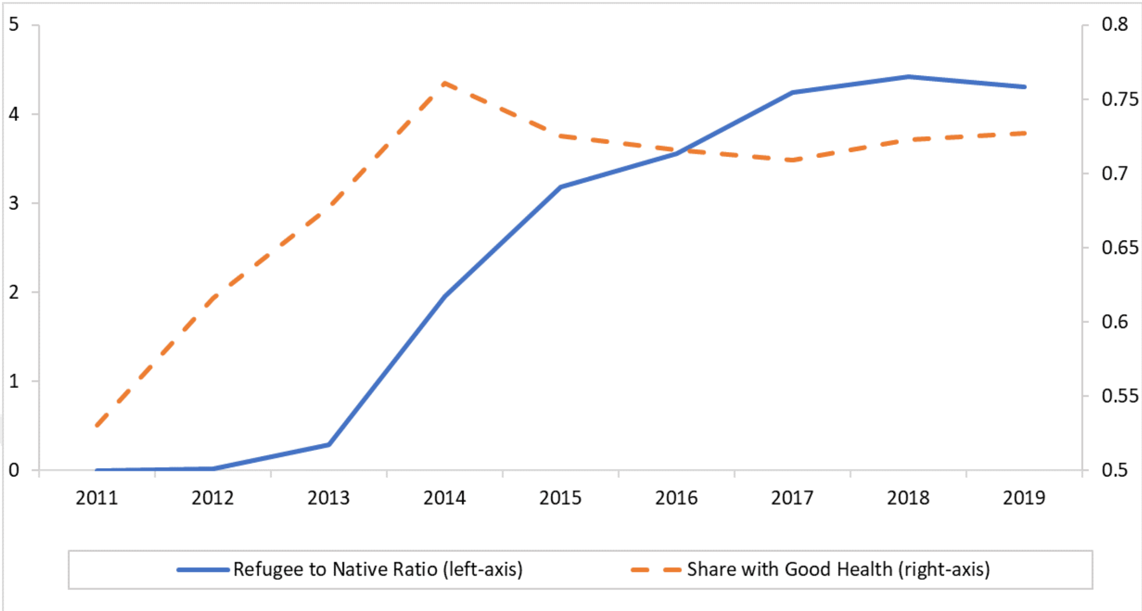
C. ADDITIONAL RESULTS FOR CHAPTER 4

Figure C.1: Geographic Distribution of Syrian Refugees Across Regions at the NUTS-1 Level



Source:Ministry Interior of Turkey and Turkstat.

Figure C.2: Trends in Share of Refugees and Natives' Health Outcomes. 2011-2019



Source:Ministry Interior of Turkey and Turkstat.

Table C.1: First Stage Estimation Results

	Total	**Male**	**Female**
Number of migrants	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Aged 20-24	0.000	-0.000	0.000**
	(0.000)	(0.000)	(0.000)
Aged 25-29	0.000	-0.000	0.000**
	(0.000)	(0.000)	(0.000)
Aged 30-34	0.000*	-0.000	0.000***
	(0.000)	(0.000)	(0.000)
Aged 35-39	0.000**	0.000	0.000***
	(0.000)	(0.000)	(0.000)
Aged 40-44	0.000	-0.000	0.000***
	(0.000)	(0.000)	(0.000)
Aged 45-49	-0.000	-0.000***	0.000*** *
	(0.000)	(0.000)	(0.000)
Aged 50-54	0.000	-0.000**	0.000***
	(0.000)	(0.000)	(0.000)
Aged 55-59	-0.000	-0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Aged 60-64	0.000	-0.000**	0.000***
	(0.000)	(0.000)	(0.000)
Female	-0.000**		
	(0.000)		
Married	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)
Primary Educ.	-0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)
Secondary Educ.	-0.000***	-0.000***	-0.000**
	(0.000)	(0.000)	(0.000)
Tertiary Educ.	-0.000	-0.000*	0.000
	(0.000)	(0.000)	(0.000)
Household Size	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Observations	583,805	284,828	298,977

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-1 region-survey year level.

Table C.2: Table: Effect of Refugees on the Health Outcomes Among Subgroups of Natives when Standard Errors Clustered by the NUTS-1 Region-Treatment Year

	Dependent Variable: Healthy		
	Total	**Male**	**Female**
Total Sample			
Refugee-to-native ratio	0.113	0.156	0.078
	(0.138)	(0.032)	(0.392)
	[0.482]	[0.242]	[0.666]
Employed			
Refugee-to-native ratio	0.244	0.347	0.058
	(0.006)	(0.000)	(0.649)
	[0.197]	[0.121]	[0.832]
Not Employed			
Refugee-to-native ratio	0.058	0.007	0.091
	(0.449)	(0.931)	(0.336)
	[0.728]	[0.999]	[0.568]
Unemployed			
Refugee-to-native ratio	-0.289	-0.320	-0.345
	(0.000)	(0.000)	(0.221)
	[0.000]	[0.001]	[0.890]
Low Skilled			
Refugee-to-native ratio	0.111	0.107	0.113
	(0.192)	(0.186)	(0.269)
	[0.549]	[0.426]	[0.590]
High Skilled			
Refugee-to-native ratio	0.205	0.292	0.000
	(0.017)	(0.004)	(0.999)
	[0.231]	[0.154]	[0.817]

Notes: P-values corresponding to main analyses (standard errors are clustered by the NUTS-1 region-survey year level) are given in the parentheses.The wild bootstrap cluster p-values are presented in square brackets for the NUTS-1 region and treatment years.

Table C.3: Table: Effect of Refugees on the Overcrowding when Standard Errors Clustered by the NUTS-1 Region-Treatment Year

	Dependent Variable: Crowding		
	Total	**Male**	**Female**
Total Sample			
Refugee-to-native ratio	0.196	0.198	0.193
	(0.000)	(0.000)	(0.004)
	[0.160]	[0.149]	[0.201]
Employed			
Refugee-to-native ratio	0.206	0.187	0.234
	(0.000)	(0.007)	(0.034)
	[0.151]	[0.135]	[0.174]
Not Employed			
Refugee-to-native ratio	0.200	0.215	0.183
	(0.002)	(0.001)	(0.012)
	[0.186]	[0.174]	[0.257]
Unemployed			
Refugee-to-native ratio	0.286	0.199	1.310
	(0.006)	(0.060)	(0.001)
	[0.050]	[0.075]	[0.063]
Low Skilled			
Refugee-to-native ratio	0.163	0.132	0.190
	(0.004)	(0.013)	(0.004)
	[0.155]	[0.135]	[0.181]
High Skilled			
Refugee-to-native ratio	0.414	0.463	0.246
	(0.001)	(0.001)	(0.143)
	[0.173]	[0.148]	[0.367]

Notes: P-values corresponding to main analyses (standard errors are clustered by the NUTS-1 region-survey year level) are given in the parentheses.The wild bootstrap cluster p-values are presented in square brackets for the NUTS-1 region and treatment years.

Table C.4: Table: Effect of Refugees on Labor Market Outcomes when Standard Errors Clustered by the NUTS-1 Region-Treatment Year

	Dependent Variable: Job Loss		
	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	0.015	-0.004	0.024
	(0.759)	(0.950)	(0.392)
	[0.650]	[0.920]	[0.486]
Low Skilled			
Refugee-to-native ratio	0.075	0.036	0.056
	(0.216)	(0.628)	(0.108)
	[0.286]	[0.657]	[0.192]
High Skilled			
Refugee-to-native ratio	-0.048	-0.029	-0.069
	(0.354)	(0.658)	(0.303)
	[0.705]	[0.811]	[0.126]
	Dependent Variable: Job Finding		
	Total	**Male**	**Female**
Baseline Estimates			
Refugee-to-native ratio	-0.273	-0.313	-0.349
	(0.098)	(0.090)	(0.387)
	[0.392]	[0.200]	[0.827]
Low Skilled			
Refugee-to-native ratio	-0.495	-0.478	-0.824
	(0.006)	(0.009)	(0.216)
	[0.062]	[0.038]	[0.527]
High Skilled			
Refugee-to-native ratio	0.101	0.078	-0.451
	(0.721)	(0.795)	(0.399)
	[0.719]	[0.868]	[0.830]

Notes: P-values corresponding to main analyses (standard errors are clustered by the NUTS-1 region-survey year level) are given in the parentheses.The wild bootstrap cluster p-values are presented in square brackets for the NUTS-1 region and treatment years.

Table C.5: Effects of Refugees on the Health Outcomes

	Total	**Male**	**Female**
Refugee-to-Native Ratio	0.113	0.156**	0.078
	(0.076)	(0.072)	(0.091)
Aged 20-24	-0.069***	-0.064***	-0.073***
	(0.003)	(0.003)	(0.004)
Aged 25-29	-0.117***	-0.102***	-0.121***
	(0.005)	(0.004)	(0.005)
Aged 30-34	-0.175***	-0.154***	-0.181***
	(0.006)	(0.005)	(0.005)
Aged 35-39	-0.235***	-0.199***	-0.256***
	(0.006)	(0.006)	(0.006)
Aged 40-44	-0.307***	-0.257***	-0.340***
	(0.007)	(0.006)	(0.006)
Aged 45-49	-0.371***	-0.303***	-0.422***
	(0.006)	(0.006)	(0.006)
Aged 50-54	-0.441***	-0.363***	-0.503***
	(0.007)	(0.007)	(0.007)
Aged 55-59	-0.509***	-0.427****	-0.575***
	(0.007)	(0.007)	(0.007)
Aged 60-64	-0.568***	-0.489***	-0.634***
	(0.007)	(0.008)	(0.006)
Female	-0.044***		
	(0.002)		
Married	0.052***	0.029***	0.053***
	(0.005)	(0.005)	(0.004)
Primary Educ.	0.146***	0.182***	0.122***
	(0.004)	(0.006)	(0.004)
Secondary Educ.	0.223***	0.250***	0.207***
	(0.004)	(0.007)	(0.004)
Tertiary Educ.	0.295***	0.317***	0.277***
	(0.005)	(0.006)	(0.005)
Household Size	0.008***	0.004***	0.010***
	(0.001)	(0.001)	(0.001)
Observations	583,805	284,828	298,977

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors are clustered by the NUTS-1 region-survey year level.

Table C.6: Effect of Refugees on the Health Outcomes Among Subgroups of Natives if unpaid workers are not included in the employment

	Dependent Variable: Healthy		
	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.283***	0.326***	-0.014
	(0.091)	(0.093)	(0.141)
F statistic	780.7	782.9	727.8
Mean	0.807	0.810	0.799
	(0.395)	(0.393)	(0.401)
Observations	196,539	147,240	49,299
Not Employed			
Refugee-to-native ratio	0.075	0.041	0.096
	(0.078)	(0.077)	(0.093)
F statistic	842.8	857.9	834.0
Mean	0.666	0.694	0.651
	(0.472)	(0.461)	(0.477)
Observations	387,266	137,588	249,678
Unemployed			
Refugee-to-native ratio	-0.289***	-0.320***	-0.345
	(0.075)	(0.083)	(0.282)
F statistic	795.8	793.9	659.1
Mean	0.789	0.777	0.827
	(0.408)	(0.416)	(0.378)
Observations	28,221	21,732	6,489
Low Skilled			
Refugee-to-native ratio	0.111	0.107	0.113
	(0.085)	(0.081)	(0.102)
F statistic	846.5	850.0	842.5
Mean	0.654	0.702	0.614
	(0.476)	(0.457)	(0.487)
Observations	404,798	181,915	222,883
High Skilled			
Refugee-to-native ratio	0.205**	0.292***	0.000
	(0.086)	(0.103)	(0.080)
F statistic	714.3	728.2	677.6
Mean	0.849	0.845	0.854
	(0.358)	(0.362)	(0.353)
Observations	179,007	102,913	76,094

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

Table C.7: Table: Effect of Refugees on the Health Outcomes Among Subgroups of Natives

	Dependent Variable: Healthy		
	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.242***	0.344***	0.060
	(0.089)	(0.086)	(0.129)
F statistic	807.9	806.0	720.4
Mean	0.784	0.813	0.729
	(0.411)	(0.390)	(0.445)
Observations	237,113	156,894	80,219
Not Employed			
Refugee-to-native ratio	0.059	0.010	0.091
	(0.076)	(0.079)	(0.094)
F statistic	836.7	844.4	831.4
Mean	0.665	0.682	0.655
	(0.472)	(0.466)	(0.475)
Observations	346,692	127,934	218,758
	Dependent Variable: Overcrowding		
	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.205***	0.186***	0.233**
	(0.057)	(0.069)	(0.110)
F statistic	532.0	571.0	373.4
Mean	0.0439	0.0468	0.0380
	(0.205)	(0.211)	(0.191)
Observations	41,718	27,962	13,756
Not Employed			
Refugee-to-native ratio	0.200***	0.216***	0.183**
	(0.064)	(0.064)	(0.073)
F statistic	592.9	583.4	598.6
Mean	0.0468	0.0433	0.0490
	(0.211)	(0.204)	(0.216)
Observations	60,587	23,583	37,004

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.8: Table: Effect of Refugees on the Abstract Intensity

	High-Skilled	Low-Skilled
Refugee-to-native ratio	2.369	-0.748
	(1.501)	(0.567)
F statistic	713	858
Mean dependent variable	2.743	-1.708
	(6.291)	(4.071)
Observations	77,549	122,171

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.9: Table: Effect of Refugees on Labor Market Outcomes among Natives

	Dependent Variable: Employed		
	Total	**Male**	**Female**
High-Skilled			
Refugee-to-native ratio	0.178**	0.321***	-0.224*
	(0.069)	(0.108)	(0.136)
F statistic	714.3	728.2	677.6
Mean	0.557	0.675	0.399
	(0.497)	(0.469)	(0.490)
Observations	179,007	102,913	76,094
	Dependent Variable: Unemployed		
	Total	**Male**	**Female**
High-Skilled			
Refugee-to-native ratio	-0.079	-0.025	-0.079
	(0.067)	(0.085)	(0.075)
F statistic	714.3	728.2	677.6
Mean	0.067	0.072	0.059
	(0.249)	(0.259)	(0.235)
Observations	179,007	102,913	76,094

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.10: Table: Effect of Refugees on Labor Market Outcomes Among Male Natives

	Young & High-Skilled	Old & High-Skilled
Dependent Variable: Job Loss		
Refugee-to-native ratio	-0.095	0.226***
	(0.074)	(0.064)
F statistic	738.0	496.5
Mean dependent variable	0.0426	0.0171
	(0.202)	(0.130)
Observations	53,649	17,306
Dependent Variable: Job Finding		
Refugee-to-native ratio	0.086	0.636
	(0.437)	(0.588)
F statistic	566.9	317.9
Mean dependent variable	0.540	0.330
	(0.498)	(0.470)
Observations	7,212	1,210
	Young & Low-Skilled	Old & Low-Skilled
Dependent Variable: Job Loss		
Refugee-to-native ratio	-0.110	0.079
	(0.087)	(0.090)
F statistic	875.9	853.7
Mean dependent variable	0.0722	0.0401
	(0.259)	(0.196)
Observations	65,220	47,155
Dependent Variable: Job Finding		
Refugee-to-native ratio	-0.687***	-0.517
	(0.209)	(0.377)
F statistic	642.1	851.5
Mean dependent variable	0.631	0.466
	(0.482)	(0.499)
Observations	14,833	6,956

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.11: Table: Effect of Refugees on Labor Market Outcomes Among Male Natives

	Young & High-Skilled	Old & High-Skilled
Dependent Variable: Unemployed		
Refugee-to-native ratio	-0.155*	0.073
	(0.089)	(0.074)
F statistic	734.0	524.9
Mean dependent variable	0.0688	0.0208
	(0.253)	(0.143)
Observations	56,912	24,271
Dependent Variable: Employed		
Refugee-to-native ratio	0.350***	0.393
	(0.119)	(0.292)
F statistic	734.0	524.9
Mean dependent variable	0.819	0.555
	(0.385)	(0.497)
Observations	56,912	24,271

	Young & Low-Skilled	Old & Low-Skilled
Dependent Variable: Unemployed		
Refugee-to-native ratio	-0.130	0.050
	(0.092)	(0.055)
F statistic	880.2	852.3
Mean dependent variable	0.0879	0.0411
	(0.283)	(0.198)
Observations	69,594	67,561
Dependent Variable: Employed		
Refugee-to-native ratio	-0.175*	-0.075
	(0.105)	(0.091)
F statistic	880.2	852.3
Mean dependent variable	0.681	0.336
	(0.466)	(0.472)
Observations	69,594	67,561

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.12: Table: Effect of Refugees on Health Outcomes Among Male Natives

	Dependent Variable: Healthy	
	Young & High-Skilled	Old & High-Skilled
Refugee-to-native ratio	0.384***	0.436
	(0.116)	(0.277)
F statistic	734.0	524.9
Mean dependent variable	0.874	0.693
	(0.331)	(0.461)
Observations	56,912	24,271
	Young & Low-Skilled	Old & Low-Skilled
Refugee-to-native ratio	0.164	0.197
	(0.107)	(0.137)
F statistic	880.2	852.3
Mean dependent variable	0.740	0.533
	(0.439)	(0.499)
Observations	69,594	67,561

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.

Table C.13: Table: Effect of Refugees on the Overcrowding

Dependent Variables:	
Number of Hospital (Ministry of Health)	
Refugee-to-native ratio	-0.133
	(0.192)
Mean	1.459
	(0.759)
Number of Hospital (University)	
Refugee-to-native ratio	-0.041
	(0.037)
Mean	0.080
	(0.041)
Number of Nurse	
Refugee-to-native ratio ratio	70.676***
	(25.287)
Mean	182.339
	(46.941)
Number of Physician	
Refugee-to-native ratio ratio	32.410
	(24.728)
Mean	159.570
	(48.638)
Observations	338

Notes: *p<0.1 **p<0.05 ***p<0.01. All panels include controls for NUTS-2 region and survey year fixed effects.

Table C.14: Table: Effect of Refugees on the Overcrowding

	Total	Male	Female
Additional Control Variables:			
Number of Hospital (Ministry of Health)			
Refugee-to-native ratio	0.177***	0.194***	0.157***
	(0.055)	(0.058)	(0.060)
F statistic	582.6	588.4	575.6
Number of Hospital (University)			
Refugee-to-native ratio	0.320***	0.325***	0.314***
	(0.074)	(0.072)	(0.082)
F statistic	554.8	557.3	551.8
Number of Nurse			
Refugee-to-native ratio	0.248***	0.253***	0.242***
	(0.085)	(0.084)	(0.091)
F statistic	549	551	547
Number of Physician			
Refugee-to-native ratio	0.190***	0.202***	0.178**
	(0.062)	(0.059)	(0.071)
F statistic	538	539	538
All control variables above			
Refugee-to-native ratio	0.374***	0.385***	0.360***
	(0.095)	(0.096)	(0.098)
F statistic	607	610	604
Mean	0.0448	0.0446	0.0451
	(0.207)	(0.206)	(0.207)
Observations	94,419	47,682	46,737

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Control variables are the same as the baseline estimation. The dependent variable is equal to 1 if main reason for unmet need for medical or dental examination or treatment is giving to late time for appointment.

Table C.15: Effect of Refugees on the Health Outcomes with an Alternative Instrument (Del Carpio & Wagner 2015)

Dependent Variable: Healthy			
	OLS		IV
Total			
Refugee-to-native ratio	0.081		0.077
	(0.073)		(0.073)
F statistic			5442
Mean dependent variable	0.714		0.714
	(0.452)		(0.452)
Observations		583,805	
Male			
Refugee-to-native ratio	0.141**		0.132*
	(0.068)		(0.068)
F statistic			5434
Mean dependent variable	0.754		0.754
	(0.431)		(0.431)
Observations		284,828	
Female			
Refugee-to-native ratio	0.033		0.034
	(0.089)		(0.088)
F statistic			5445
Mean dependent variable	0.675		0.675
	(0.468)		(0.468)
Observations		298,977	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects.The dependent variable is a dummy indicating good or very good health status.

Table C.16: Effect of Refugees on the Health Outcomes Among Subgroups of Natives with an Alternative Instrument (Del Carpio & Wagner 2015)

Dependent Variable: Healthy			
	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.164**	0.302***	-0.128
	(0.080)	(0.084)	(0.125)
F statistic	237,539	157,155	80,384
Mean	0.784	0.813	0.728
	(0.411)	(0.390)	(0.445)
Observations	237,539	157,155	80,384
Not Employed			
Refugee-to-native ratio	0.041	-0.009	0.075
	(0.076)	(0.071)	(0.092)
F statistic	5526	5498	5530
Mean	0.665	0.682	0.655
	(0.472)	(0.466)	(0.475)
Observations	346,266	127,673	218,593
Unemployed			
Refugee-to-native ratio	-0.302***	-0.317***	-0.510**
	(0.068)	(0.082)	(0.245)
F statistic	5273	5409	3811
Mean	0.789	0.777	0.827
	(0.408)	(0.416)	(0.378)
Observations s	28,253	21,759	6,494
Low Skilled			
Refugee-to-native ratio	0.091	0.105	0.084
	(0.080)	(0.075)	(0.098)
F statistic	5610	5627	5593
Mean	0.654	0.702	0.614
	(0.476)	(0.457)	(0.487)
Observations	404,798	181,915	222,883
High Skilled			
Refugee-to-native ratio	0.123	0.217**	-0.071
	(0.076)	(0.093)	(0.070)
F statistic	4766	4895	4517
Mean	0.849	0.845	0.854
	(0.358)	(0.362)	(0.353)
Observations	179,007	102,913	76,094

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

Table C.17: Effect of Refugees on the Health Outcomes with an Alternative Instrument (Altındağ et al. 2020)

Dependent Variable: Healthy			
	OLS		IV
Total			
Refugee-to-native ratio	0.081		0.061
	(0.073)		(0.072)
F statistic			1858
Mean dependent variable	0.714		0.714
	(0.452)		(0.452)
Observations		583,805	
Male			
Refugee-to-native ratio	0.141**		0.106
	(0.068)		(0.067)
F statistic			1822
Mean dependent variable	0.754		0.754
	(0.431)		(0.431)
Observations		284,828	
Female			
Refugee-to-native ratio	0.033		0.029
	(0.089)		(0.087)
F statistic			1889
Mean dependent variable	0.675		0.675
	(0.468)		(0.468)
Observations		298,977	

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.

Table C.18: Effect of Refugees on the Health Outcomes Among Subgroups of Natives with an Alternative Instrument (Altındağ et al. 2020)

	Total	**Male**	**Female**
Employed			
Refugee-to-native ratio	0.160**	0.272***	-0.064
	(0.082)	(0.084)	(0.122)
F statistic	1644	1737	1374
Mean	0.784	0.813	0.728
	(0.411)	(0.390)	(0.445)
Observations	237,539	157,155	80,384
Not Employed			
Refugee-to-native ratio	0.021	-0.027	0.054
	(0.074)	(0.073)	(0.091)
F statistic	1973	1908	2007
Mean	0.665	0.682	0.655
	(0.472)	(0.466)	(0.475)
Observations	346,266	127,673	218,593
Unemployed			
Refugee-to-native ratio	-0.299***	-0.315***	-0.522**
	(0.070)	(0.082)	(0.260)
	0.000	0.000	0.044
F statistic	2130	2129	1819
Mean	0.789	0.777	0.827
	(0.408)	(0.416)	(0.378)
Observations	28,253	21,759	6,494
Low Skilled			
Refugee-to-native ratio	0.078	0.078	0.079
	(0.080)	(0.076)	(0.097)
F statistic	1926	1909	1937
Mean	0.654	0.702	0.614
	(0.476)	(0.457)	(0.487)
Observations	404,798	181,915	222,883
High Skilled			
Refugee-to-native ratio	0.102	0.192**	-0.092
	(0.077)	(0.096)	(0.068)
F statistic	1484	1530	1382
Mean	0.849	0.845	0.854
	(0.358)	(0.362)	(0.353)
Observations	179,007	102,913	76,094

Notes: *p<0.1 **p<0.05 ***p<0.01. Standard errors clustered by the NUTS-1 region-survey year level are given in the parentheses. Regressions include age-interval fixed effects, education categories (less than primary education (omitted), primary, secondary, and tertiary education), marital status, household size, the current region of residence (NUTS-1 level), survey year, and five region-year fixed effects. The dependent variable is a dummy indicating good or very good health status.