

The Impact of Syrians Refugees on the Turkish Labor Market

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Abstract

Civil war in Syria has resulted in more than four million refugees fleeing the country, of which 1.8 million have found refuge in Turkey, making it the largest refugee-hosting country worldwide. This paper combines newly available data on the 2014 distribution of Syrian refugees across subregions of Turkey with the Turkish Labour Force Survey, to assess the impact on Turkish labor market conditions. Using a novel instrument, the analysis finds

that the refugees, who overwhelmingly do not have work permits, result in the large-scale displacement of informal, low-educated, female Turkish workers, especially in agriculture. While there is net displacement, the inflow of refugees also creates higher-wage formal jobs, allowing for occupational upgrading of Turkish workers. Average Turkish wages have increased primarily as the composition of the employed has changed because of the inflow of refugees.

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1. INTRODUCTION

Refugees pose a massive moral, political and economic challenge for potential host countries.¹ The scale of the challenge is larger than ever, with nearly 60 million people forcibly displaced by conflicts across the world (UNHCR, 2014). The figure is 8.3 million higher than in 2013, driven mainly by the war in Syria, the advance of ISIS in Iraq, resurgent conflicts in Africa, and the persecution of the Rohingya people in Myanmar.² A key aspect of that challenge is economic, with an immediate need for food, housing, health care, and perhaps most importantly “states want to choose their economic migrants, not be chosen by them” on account of the plausibly far-reaching labor market consequences.³

While there is a vast literature on the impact of ‘voluntary’ migration, two recent survey articles emphasize the lack of evidence on the economic consequences of forced displacement for host countries (Ruiz and Vargas-Silva, 2013, and Mabiso et al., 2014). Moreover, even though in 2014 less than 30 percent of refugees were housed in managed camps,⁴ existing evidence is mostly on the impact of refugees in camps thereby confounding the labor market effects with other channels, such as the concentration of the humanitarian sector in one particular location.⁵ With developing countries hosting 86 percent of the world’s refugees (UNHCR, 2014), the paucity of evidence can foremost be explained by a lack of high quality data on refugee locations and native outcomes. This paper uses newly available, reliable information on the number and distribution of Syrian refugees in Turkey to address this gap in the literature.

War in Syria has produced more refugees than any other conflict of the past two decades: over 4 million have fled the country, with an additional 7.6 million internally displaced.⁶ About 1.8 million Syrians found refuge in Turkey, making it the largest refugee-hosting country worldwide. The large majority (85 percent) of Syrians have left the refugee camps, and despite

¹ See, for example, the recent leader in *The Economist* (April 23, 2015) on the European Union’s policy on maritime refugees <http://www.economist.com/news/leaders/21649465-eus-policy-maritime-refugees-has-gone-disastrously-wrong-europes-boat-people>.

² *The Economist* (June 18, 2015) <http://www.economist.com/blogs/graphicdetail/2015/06/daily-chart-15?zid=312&ah=da4ed4425e74339883d473adf5773841>

³ *The Economist* (April 25, 2015), p. 11.

⁴ UNHCR (2014). In addition, only a small fraction of internally displaced people lives in camps.

⁵ Alix-Garcia and Saah (2009), Maystadt and Verwimp (2014), and Ruiz and Vargas-Silva (2015) on refugees from Burundi and Rwanda to Tanzania; Kreibaum (2014) on Congolese refugees in Uganda; Akgunduz, van den Berg and Hassink (2015) and Ceritoglu et al. (2015) on Syrian refugees in Turkish camps. Exceptions include Braun and Mahmoud (2014) who present evidence on the influx of German expellees to West Germany after World War II, and Kondylis (2009) on displaced people in Bosnia-Herzegovina.

⁶ *The Economist* (June 21, 2014) <http://www.economist.com/node/21604577>. The latest figures are for July 2015 from the UNHCR and The Internal Displacement Monitoring Centre.

a lack of work permits entered the Turkish labor market. This has become a major source of concern, with a 2014 survey finding that 56 percent of Turkish people agree with the proposal asserting that “Syrians take our jobs,” with that number rising as high as 69 percent in provinces close to the Syrian border (Erdogan, 2014).

In late 2014 the first reliable information on the number and distribution of Syrian refugees across Turkey became available. This paper combines this information with an AFAD (The Disaster and Emergency Management Presidency of Turkey) survey on the origin cities of Syrian refugees, and the 2011 and 2014 Turkish Household Labour Force Survey. Our instrumental variable estimates are consistent with one-for-one displacement of Turkish workers by Syrian refugees in a local labor market.⁷ This is the result of large-scale displacement of Turkish workers in informal jobs, particularly women, the low educated and workers in agriculture. At the same time there is a refugee-induced increase in employment of Turkish workers in formal jobs. Hence, refugees change both the level and composition of Turkish employment. They are net substitutes for some workers, while at the same time generating demand for higher wage, formal employment, allowing a significant number of Turkish to upgrade their jobs.⁸ Interestingly, among women the displacement from the labor market is also associated with an increase in school attendance. The inflow of refugees causes average wages to increase, primarily due to changes in the composition of Turkish employment. On average around 60 percent of the wage gains can be accounted for due to refugee-induced change in the observed characteristics of the employed. For female workers once composition effects are accounted for, the residual wage changes are large and negative.⁹

A second contribution of the paper lies in the fact that the data on Syrian refugees’ origin and destination regions allows us to construct a novel instrument. It is fairly common to use travel distance as an instrument for measuring impact in the migration literature. The potential shortfall of this instrument is that distance may also be capturing other differences between

⁷ The large magnitude of the estimated displacement effects in part reflects relocation of Turkish workers across subregions.

⁸ The results also speak to a growing literature on the heterogeneous effects of immigration on a host country: displacement of low-skilled workers combined with occupational upgrading of natives. See for example Peri and Sparber (2009).

⁹ Two previous papers use 2013 data on Syrian refugees in Turkish camps (as opposed to all refugees) and a difference-in-difference strategy. Akgunduz, van den Berg and Hassink (2015) find that housing and to a lesser degree food prices increased, but little evidence of refugees crowding out natives in local labor markets. Ceritoglu et al. (2015) find employment losses among informal, less educated, young and female workers.

communities.¹⁰ Our instrument uses the fact that refugees from different Syrian governorates will use different border-crossings (there are ten between Turkey and Syria) to reach different parts of Turkey generating considerable variation in travel distances.¹¹ This results in sufficient identifying variation in our instrument that we are able to include a high-order polynomial of the inverse distance from the closest border crossing as a control variable. Thus our estimates do not confound the impact of refugees with unobservables that are correlated with distance from the border. Moreover, placebo tests show that the instrument is uncorrelated with pre-existing trends in employment, as well as with the likely impact of a major 2012 education reform.

The paper proceeds as follows. Section 2 provides background on the Syrian refugees in Turkey, and Section 3 describes the data and some preliminary evidence. Section 4 outlines our empirical strategy. Our employment results and a placebo test are described in Section 5; the impact on wages in Section 6. Section 7 concludes.

2. BACKGROUND

Since the inception in March 2011 of the continuing civil war in Syria, 4.02 million registered refugees have fled Syria, primarily to Turkey (1.81 million), Lebanon (1.17 million), Jordan (629,000), Iraq (251,000), and Egypt (132,000).¹² In 2011 there was only a modest outflow of refugees from Syria, reaching 8,000 in Turkey in December 2011. The number of refugees to Turkey then started to grow rapidly in 2012 and continues to do so. Starting in late 2014, the Turkish government issued new identity cards to Syrian refugees designed to give more straightforward access to a wider range of basic services outside of the camps; these services include aid, job offers, education, and health care.¹³ The registration drive accompanying the new identity cards also dramatically improved the counting of refugees outside camps,

¹⁰ The use of distance as an instrument goes back to at least Card (1995). In various forms it has been used by, for example, McKenzie, Gibson and Stillman (2010), Peri (2012), and Black et al. (2015) for voluntary migration; and in the literature on refugees by Baez (2011), Maystadt and Verwimp (2014), and Ruiz and Vargas-Silva (2015).

¹¹ We use the variation generated by 364 origin-destination pairs.

¹² UNHCR data from July 2015 available at <http://data.unhcr.org/syrianrefugees/regional.php>. Refugees were registered by the UNHCR in Egypt, Iraq, Jordan and Lebanon, and by the Government of Turkey.

¹³ New York Times (December 29, 2014) http://www.nytimes.com/2014/12/30/world/europe/turkey-strengthens-rights-of-syrian-refugees.html?_r=0, and Hurriyet Daily News (January 12, 2015) <http://www.hurriyetdailynews.com/turkey-provides-15-million-id-cards-for-syrian-refugees-.aspx?pageID=238&nID=76788&NewsCatID=341>.

providing a far more accurate picture of the number and distribution of Syrian refugees across Turkey. In late 2014, the final year of the analysis in this paper, there were 1.6 million Syrian refugees in Turkey, 86 percent of which lived outside camps (Erdogan, 2014).

Figure 1 depicts the ratio of Syrian refugees to total population for the 26 NUTS2 subregions in Turkey (the map depicts the provinces which constitute these NUTS2). The highest ratios are found in Gaziantep (13 percent), Hatay (9 percent), Mardin (7 percent) and Sanliurfa (5 percent), all of which are located on the Turkish-Syrian border, and host 62 percent of all Syrian refugees in Turkey.¹⁴ Areas further away from the border are less affected, with Adana, Istanbul and Konya at a refugee-population ratio of around 2 percent, the next set of subregions most strongly impacted; and all other subregions with a ratio of under 1 percent.

Figure 2, using data from AFAD (2013), provides an overview of the Syrian governorates from which the vast majority of refugees to Turkey originated. The refugees primarily come from northwest Syria, with 36 percent of them originating from Aleppo alone.

Turkey has had a generous open-door policy toward Syrian refugees, but until late 2014 the refugees had been labeled “guests” under a hazily defined temporary protection measure. Importantly for this paper, for the period studied the overwhelming number of Syrian refugees if employed will have been so informally. In principle, Syrians who entered the country through the official border crossings and who have passports can apply for residence permits and subsequently for the right to work. In practice, this is a long and cumbersome practice, and by late 2014 at most several thousand had been issued. The reforms in late 2014 aimed to facilitate the process of obtaining work permits for Syrians; but it is unclear how many in practice have been issued.

The economic impact of Syrian refugees in Turkey extends beyond changes in the potential labor supply of informal workers in a number of important ways. There has been extensive humanitarian aid provided to the refugees, overwhelmingly by the Turkish government. Reportedly, by early 2015 the Turkish state had spent \$6 billion (with total outside contributions \$300 million).¹⁵ Much of these funds have been spent on food, various services, non-food items such as medicines, clothing, shelter, and housing-related goods. Further, Syrian refugees arrive with financial assets, with wide reaching effects. For example, firm data show that Syrians have invested in Turkey in meaningful ways; the data show that 26 percent of new registered businesses in Turkey in 2014 had Syrian ownership or capital (World Bank, 2015).

¹⁴ Istanbul has the largest number of refugees (21 percent).

¹⁵ Hurriyet Daily News (February 2015) <http://www.hurriyetdailynews.com/turkey-urges-worlds-help-on-syrian-refugees-as-spending-reaches-6-billion.aspx?pageID=238&nID=78951&NewsCatID=359>.

3. DATA AND DESCRIPTIVE STATISTICS

3.1 Data Sources

This paper relies on the Turkish Household Labour Force Survey (LFS), primarily for 2011 and 2014, for comprehensive information on labor market outcomes in Turkey. The LFS does not, however, contain any information on Syrian refugees. The Disaster and Emergency Management Presidency of Turkey (AFAD) provides information on the number of Syrian refugees. The numbers used in this paper are taken from Erdogan (2014), who draws on information from AFAD and the Ministry of Interior, and reports the number of refugees by NUTS2 subregion.

The origin governorates of Syrian refugees, used to construct the instrument used for the analysis, are taken from an AFAD (2013) survey of the main refugee camps where Syrian refugees live (or pass through when they arrive) in Turkey. Finally, Google Maps was used to derive the driving distance between each governorate in Syria and the most populous city in each NUTS2 subregion in Turkey.

3.2 Variable Definitions and Descriptive Statistics

Our sample of interest is the Turkish working-age population (15 to 64 years of age). Our main employment indicator includes all forms of paid employment, as an employee, employer or self-employed. Additional labor force status measures are: those who are employed but unpaid, for example as family workers, public employees, the unemployed, those who attend school and are retired. We use six main indicators describing a respondent's type of job: whether the job is formal or informal, full- or part-time, a regular or field job. Formal jobs are defined as paid employment where the respondent declares they pay social security contributions (which is mandatory for everyone earning money in Turkey, with no exceptions). Informal jobs are defined as paid employment where the respondent declares that they do not pay social security contributions, and unpaid jobs. "Field, garden" is a workplace category in the LFS, we also include "market place" in this category, both of which basically mean that a respondent is directly involved in agricultural production (and sale). The main workplace category is a "regular workplace;" the other two very small workplace categories are "mobile or irregular workplace" and "at home."

The earnings measure we use is the response to the question "how much did you earn from your main job activity during the last month?" In the LFS 2011 there is further information on how much of that income was irregular, for example a bonus payment, but the LFS 2014 no longer provides that breakdown. There is also a measure of the "number of hours per week

worked in the main job” (both usual and total hours), which can be used to construct hourly wages. Since the hours worked measure does not correspond exactly to the earnings measure and introduces additional measurement error, our preferred wage measure is the monthly wage. Summary statistics of the different outcome indicators are presented in Table 1, for the years 2011 and 2014.¹⁶

Labor force participation is low in Turkey, 44 percent in 2014; the low level of participation is most pronounced among women who constitute less than one-quarter of the labor force. The fraction of people enrolled in school has been rising over time, to 15 percent in 2014 from 12.4 percent in 2011. Part of the rise is presumably related to the education reform that took place in 2012, which made it compulsory to attend school for 12 years. Still around 55 percent of workers, ages 25 to 64, have only completed primary school, and about 23 percent have a university degree or any qualification beyond high school. Informality is substantial at around 30 percent of workers, self-employment is substantial at 18.5 percent in 2014 and more important than the public sector (14.2 percent), and the importance of agriculture is highlighted with 11.1 percent field workers. Monthly earnings in 2014 were on average 1,443 Turkish Lira (TL), around \$650, hourly wages were on average 7.49 TL (around \$3.40).

3.3 Preliminary Evidence

Initially, at the start of the civil war, Syrian refugees were overwhelmingly located in refugee camps in Turkey, near the Syrian border. Since then they have dispersed across Turkey. But as described in Section 2 above, refugees are still disproportionately located in the regions bordering Turkey. This suggests that it may be feasible to compare the outcomes in affected versus unaffected regions, an approach taken by Akgunduz, van den Berg and Hassink (2015) and Ceritoglu et al. (2015).

Of the 26 NUTS2 subregions, four subregions (Gaziantep, Hatay, Mardin and Sanliurfa) are located on the Turkish-Syrian border and host 62 percent of all Syrian refugees in Turkey.¹⁷ These border subregions also have the largest proportion of Syrians to total population, more than 5 percent in each subregion (see Figure 1 above). A simple comparison of border versus non-border regions before and after the arrival of Syrian refugees may hence provide informative, non-causal evidence on the impact of refugees.

¹⁶ In 2014 new regulations for the Household Labour Force Survey were carried out within the framework of European Union criteria. Consequently, statistics are not necessarily comparable across years.

¹⁷ Ceritoglu et al. (2015) use these 4 subregions and Adana as their treatment group (with Agri, Erzurum, Malatya and Van as the control group). Akgunduz, van den Berg and Hassink (2015) in addition include Adana and Malatya in their treatment group (with the rest of Turkey as the control group).

Table 2 provides a comparison of border and non-border NUTS2 subregions in 2011 (pre-refugees) and 2014 (post-refugees). Columns 3 and 6 report the differences between border and non-border regions in 2011 and 2014 respectively. Column 7 reports the difference-in-difference estimate. Labor market indicators for border and non-border subregions are clearly very different. In particular, border regions having far lower employment to working-age population rates (34 compared to 43 percent in 2011) on account of far lower formal employment rates (16 compared to 30 percent), and around 10 percent lower wages. These differences are further exacerbated in 2014, with the difference-in-difference estimator suggesting less employment and more unemployment, as well as more field workers and less regular workers, and lower earnings. However, when clustering standard errors by subregion and year (52 clusters) none of the difference-in-difference estimates are statistically significant except for the wage results, which are significant at the 10 percent significant level.¹⁸

4. EMPIRICAL STRATEGY

4.1 Estimating Equations

The central contribution of this paper is in understanding the impact of refugees on the labor market outcomes of the local (native) population. We consider a large number of such outcomes using a common empirical framework.

To estimate the impact of the influx of Syrian refugees into Turkey on outcome Y for individual i in year t and subregion r we consider the following estimating equation:

$$Y_{itr} = \gamma R_{rt} + f_t(D_r) + g(X_{irt}) + \delta_r + \delta_t + \varepsilon_{irt}, \quad (1)$$

where the main variable of interest is the number of Syrian refugees normalized by the population R of a subregion. Further, we include subregion δ_r and year δ_t fixed effects, flexible individual level controls X , and a high-order polynomial of the inverse distance, D , of each subregion to the Syrian-Turkish border the impact of which is allowed to vary across years.

There are four main challenges to a causal interpretation of a regression of refugee numbers on native outcomes, i.e. reasons to believe that the refugee flows might not be exogenous with respect to outcomes. First, the location decisions of Syrian refugees may be endogenous. For example, if Syrians disproportionately move to places in Turkey where there are a lot of

¹⁸ Clustering at the level of the 26 NUTS2 subregions to also deal with serial correlation in outcomes generally leads to smaller standard errors; we do not report these.

economic opportunities, there would arise a spurious positive correlation between them and positive economic outcomes for the Turkish working-age population. To address the endogeneity of refugee flows we instrument for refugee numbers in a sub-region (R). See below for a discussion of the instrument.

Second, despite the inclusion of subregion fixed effects and instrumenting for refugee location decisions there may be economic trends that are systematically correlated with refugee flows. While there is mixed evidence on whether the poorer eastern parts of Turkey are more recently experiencing some degree of economic convergence with the much wealthier north-western and western regions (see, for example, recent work by Akcagun, Ocal and Yildirim, 2013), the fact the refugee flows are geographically quite concentrated raises the concern of a spurious correlation with underlying economic trends. To address this concern we control for distance from the Syrian border using a high-order polynomial. In addition, below we present a placebo test for our instrument in the pre-period (2009 – 2011).

Third, the civil war in Syria will have a direct economic effect on Turkey, for example due to changes in trade patterns. This impact will vary across subregions, with border-regions likely more affected, and thus may be correlated with the flows of people across the border into Turkey. To control for the direct economic impact we allow the impact of distance from the Syrian border to vary by year. Fourth, Turkish workers may respond to the inflows of Syrians by relocating across subregions, thereby plausibly attenuating any impact of Syrian refugees. We directly test this hypothesis, below, and do find evidence of displacement.

4.2 Instrument

The central challenge in estimating the equation defined in (1) is the endogeneity of immigrant location decisions, which are likely to be correlated with unobserved shocks (positive or negative) to the demand for labor in a subregion. The likelihood of biased ordinary least squares (OLS) estimates makes it important to instrument for the inflow of refugees to a subregion.¹⁹

Our instrumenting strategy is based on the idea that travel distance, from the Syrian governorate from which the refugee is fleeing to each potential destination Turkish subregion, is a key determinant of refugee location decisions. We use Google Maps to calculate the travel distance T_{sr} from each Syrian governorate capital (s), to the most populous city in each Turkish NUTS

¹⁹ An additional advantage of the IV approach is that it helps deal with measurement problems. Despite the improved measures of refugee numbers in Turkey by subregion starting in 2014, there is likely considerable measurement error, resulting in attenuation bias in the OLS estimates. For the IV estimates to be consistent, it is only necessary that - conditional on the fixed effects and control variables - the flows of Syrian refugees are uncorrelated with the instrument.

2 subregion (r). The instrument for the number of refugees at a given point of time in each Turkish subregion is given by:

$$IV_{rt} = \sum_s \frac{1}{T_{sr}} \pi_s R_t, \quad (2)$$

where R_t is the total number of registered Syrians in Turkey in a year and π_s the fraction of protection seekers that come from each Syrian province.

The instrument will take on larger values for Turkish NUTS2 close to border-crossings and smaller values for those far away. The key threat to the validity of any distance-based instrument is that subregions that are close to a border crossing will systematically differ from those further away. This may be due to the direct effect of the Syrian civil war or due to pre-existing trends. To our knowledge uniquely, we are able to directly deal with this concern by, as discussed above, including a high-order polynomial of the inverse distance from the closest Syrian border-crossing to the most populous city in each Turkish NUTS 2 subregion. If there were only a single border crossing between Turkey and Syria, the estimation could no longer separately identify the impact of the instrument from the direct effect distance from the border has on economic activity. Instead, identification relies on the fact that there are multiple border-crossings between Turkey and Syria, and Syrians from different provinces have a differential likelihood of using any one of these. Once distance controls are included, the key identifying assumption of the instrument is that unobserved trends in economic outcomes in a NUTS2 systematically depend only on the proximity of a NUTS2 to the border, while the flow of Syrians refugees also depends on the degree to which Syrians from each governorate are likely to flee to Turkey and the different border crossings they are likely to use. The instrument is significant at the one percent significance level in every specification estimated, showing that despite controlling directly for distance from the border the instrument provides sufficient identifying variation.

5. RESULTS: EMPLOYMENT

5.1 Aggregate Impacts on the Employment Status of Natives

The main results are presented in Tables 3a, 3b, 4a and 4b. OLS estimates are shown in Tables 3a and 4a, IV estimates in Tables 3b and 4b. The baseline estimates without individual controls, see equation (1), are presented in Panel A of each table. Panel B shows the results for a full specification including individual covariates: fully interacted dummy variables for gender,

education and year, as well as a gender, education and year-specific second-order polynomial in potential experience. In all regressions the sample consists of all working-age (ages 15 - 64) Turkish people and the outcome variable is binary. Standard errors are clustered at the level of variation of the instrument: 2 years (2011 and 2014) and 26 NUTS2 subregions for a total of 52 clusters.²⁰ All regressions use the sample weights provided in the LFS.²¹

Tables 3a and 3b show the results for the impact of refugees on basic labor market status indicators: paid, unpaid and public sector employment, unemployment, school attendance and retirement. The OLS estimates (Table 3a) are typically more positive than the IV estimates (Table 3b), providing evidence that refugees disproportionately migrate to Turkish subregions that experience unobserved positive shocks to economic conditions.

Focusing on the IV estimates, we find evidence of extensive displacement of Turkish workers by Syrian refugees. The point estimates, -1.1 and -1.4 in baseline and full specification respectively, suggest that a 1 percentage point increase in the ratio of refugees to population in a subregion resulted in a greater than 1 percentage point decrease in the Turkish employment probability. This is consistent with one-for-one displacement of Turkish workers by refugees, though since the refugee employment rate is likely higher than that for the Turkish displacement is probably less pronounced.²²

The negative impact of refugees is significantly greater on those who are classified as unpaid employees (a point estimate of around -2.4). There is no statistically significant impact on public sector employment, though the point estimates are consistently positive. Surprisingly, even as employment rates decrease due to the arrival of refugees, unemployment rates also decrease at about the same rate (point estimates of around -1.1), resulting in large increases in those out of the labor force. Part of the explanation for this finding may lie in the significant increase in school attendance (or higher education) among the Turkish as a result of the refugee flows. Plausibly as Turkish workers experience a worsening of labor market opportunities, some remain or return to school, while others are discouraged from seeking employment.²³ The results though suggest that there is no significant impact on workers' retirement decisions.

²⁰ Clustering at the level of the 26 NUTS2 subregions to also deal with serial correlation in outcomes generally leads to smaller standard errors; we do not report these.

²¹ Estimates are from a linear probability model and two-stage least squares, probit and ivprobit results are very similar.

²² The magnitude of the effect is about double as large as those suggested by the difference-in-difference estimates presented in Section 3.3 above.

²³ There are some 12-month retrospective questions in the LFS that provide descriptive evidence on labor market transitions.

Tables 4a and 4b summarize the employment impact of refugees by type of employment relationship. The results show that the negative employment impact of the inflow of refugees is concentrated among informal and part-time jobs, and among workers employed in agriculture (fields or markets). At the same time there is a refugee induced increase in employment of Turkish workers in formal jobs and “regular” employment. Since Syrian refugees have not received work permits in Turkey, they will most likely work informally. Hence, it is unsurprising that they primarily displace informally employed Turkish workers (35 percent of which are also unpaid). The magnitude of this displacement effect is very large, a point estimate of around -5.0. Given that around 40 percent of the labor force (or 20 percent of the working-age population) is informally employed, the result suggests that refugees displace informally employed native workers by more than one-to-one.

While the displacement effects seem very large, we also find that the inflow of refugees results in a large number of formal jobs being created, with a point estimate of 1.5 and 1.2 in the baseline and full specifications, respectively. Hence, a more complicated picture emerges. Refugees displace informal, frequently unpaid, workers but also generate demand for higher-quality formal jobs that are filled by Turkish workers. In the same vein, all the negative employment effects of the refugees flow is in part-time work, with the number of full-time jobs practically unaffected. Turkish field and market workers are displaced, a point estimate of -4.4; but additional regular (non-field) jobs are created due to the refugees, a point estimate of 1.1 or 1.3 depending on the specification.

5.2 Results by Gender, Age and Education

Table 5 shows IV results, based on estimating equation (1), for different subgroups of Turkish: female, male, ages 15 – 24 and 25 – 64, and by highest educational attainment (primary school, high school and with a higher degree) for those aged 25 – 64. All regressions include a full set of covariates, and standard errors are clustered by year-subregion.

The negative native employment impact of the inflow of refugees is entirely a result of a reduction in female employment (a point estimate of -2.8), with no net impact on men (an estimate of 0.04). Women experience very large reductions in informal employment and fieldwork, without a corresponding increase in formal and regular employment. In contrast, for men large increases in formal and regular employment offset the decrease in informal employment and fieldwork. The inflow of refugees does not have a pronounced differential impact across age groups. The exception is the positive impact on the fraction attending school, which is entirely concentrated among the young. For those ages 15 – 24 the estimate is 2.9; for those ages 25 – 64 the impact is actually slightly negative, an estimate of -0.2. Moreover, only

women experience increases in school attendance, with no statistically significant impact for men.

The results by educational attainment suggest that the negative net labor market consequences of Syrian refugees is limited to Turkish workers who have at most high school completion. On the other hand, those with a higher degree (typically university) experience net increases in their employment rate, a point estimate of 0.9. In all education groups there is a reduction in the number of informally employed native workers due to the refugees, and an increase in the number of people formally employed. For those with at most primary or high school completion the displacement effect dominates, while those with degrees experience net gains.

In sum, the evidence shows that the inflow of refugees leads to large-scale displacement of low-skilled Turkish workers in informal jobs, particularly in fieldwork. This suggests that Syrian refugees and Turkish workers are highly substitutable for these jobs (at least as long as the refugees are unable to obtain work permits). However, the inflow of refugees also creates jobs for Turkish workers. This is likely due to refugees decreasing the costs of production for Turkish firms (an expansion of the supply of certain types of labor), resulting in a scale effect which it appears to outweigh the substitution effect for formal, regular jobs; thus increasing the demand for those types of jobs.²⁴ It is also worth emphasizing that only about 15 percent of refugees are in camps, and so the estimates should be viewed as primarily reflecting changes in the labor market. Nevertheless, in addition to the supply shock the demand curve in many sectors will have shifted outward, due to the consumption of refugees, as well as the economic activity generated by the efforts to help the refugees. The fact that the magnitude of the estimated displacement effect is very large reflects the high degree of substitutability between refugees and certain Turkish workers (informal, part-time and field workers). It also likely reflects the relocation of Turkish workers across provinces.

5.3 Native Relocation

An important concern when interpreting the estimates is whether the Turkish respond to the Syrian refugees by relocating across NUTS2 subregions. Specifically, whether Turkish workers that experience worsening labor market conditions (the informally employed and field workers) leave the subregion where they live, while others (the formally employed with regular jobs) move into these subregions to take advantage of new opportunities. This would help

²⁴ See Ozden and Wagner (2014) for a discussion of scale and substitution effects arising from immigration.

explain the large point estimates obtained at the level of the local labor market, and would also suggest that the impact at the national level might be significantly attenuated.²⁵ We test for population movements in response to the inflow of refugees in two distinct ways.

The Turkish LFS asks respondents whether they had previously lived in a different province (one of Turkey's 81 NUTS3 regions), and if so in what year they moved to their current province. We use two variables that indicate whether a respondent relocated across provinces: in the current year and in the current or past year. The reason we use two measures is that since respondents are surveyed throughout the year the current year relocation numbers are about half in magnitude of those in other years.

Tables 6a and 6b report OLS and IV, respectively, estimates of the impact of the inflow of refugees on the probability an individual having relocated into a province. The first column presents the estimates for the whole sample, subsequent columns for different samples based exogenous individual characteristics: female male, ages 15-24, and ages 25-64.

The OLS estimates are consistently more positive than the IV estimates, suggesting that refugees tend to locate in those regions to which natives are moving. The IV estimates are consistently negative and statistically significant, consistent with our finding that refugees on net displace natives. Some of this displacement results in natives moving out of provinces that experience an inflow of refugees. Since the magnitude of our second relocation measure (Panel b) is nearly three times that of our first (Panel A), the magnitude of our estimates in the two panels are very similar. They are consistent with the arrival of 10 refugees in a province causing 2.5 natives to leave. The relocation of natives across provinces due to the arrival refugees can explain about one-quarter of the total displacement effect highlighted in Section 5.1 above. The impact is larger for women than men, consistent with our finding that refugees displace primarily women from the labor market. It is also somewhat larger for the young. To help contextualize these results, annually 3-4 percent of respondents relocate across provinces, young people ages 15-24 relocate at around double that rate. The point estimates suggest that on average the inflow of refugees, a number equal to 2 percent of the Turkish population, has increased the rate at which natives relocate by a substantial 0.5 percent.

5.4 Placebo Tests

The key threat to the validity of our instrument is that there are subregion specific economic trends that are correlated with Syrian refugee flows, but not fully controlled by the inclusion

²⁵ Borjas (2006) finds evidence for such movements in the US, as do Del Carpio et al. (2015) and Ozden and Wagner (2014) for Malaysia, which they use to explain their finding of large employment effects of immigration at a regional level.

of the high-order polynomial in the inverse distance of a Turkish subregion from a border crossing to Syria. *A priori* this seems unlikely since the instrument is also based on travel distances, but we can also test for the existence of such trends in a pre-period. Specifically, we run regressions that are analogous to those in Section 5.1, above, using data from the LFS 2009 and 2011. As a placebo test we pretend that the Syrian refugees had arrived between 2009 and 2011, rather than between 2011 and 2014, to see if the instrument is correlated with Turkish outcomes in this pre-period.

Table 7 presents the results of our placebo test. The OLS estimates are in Panel A, the IV estimates in Panel B. We present results for our key outcome variables: paid employment, formal and informal employment, and for school attendance. We show results for both specifications without and with the high-order polynomial of the inverse distance from a Syrian border crossing as control variables.

Our placebo tests strongly suggest that there are neither pre-existing employment trends by subregion that are correlated with the actual subsequent inflow of refugees (the OLS results), nor the instrumented refugee flows (IV results). Once we include controls for distance none of the employment estimates are statistically significant, and the magnitude of the point estimate for the overall employment effect is small. Even without the distance controls, only the IV results for formal employment are statistically significant, and they suggest a negative pre-trend. Neither do we find significant pre-trends for any of the other outcome variables considered in this paper (results not presented here). The only exception is for schooling, which is why we present those result. Once we control for distance from the border, the instrument is negatively correlated with the fraction of people in a subregion who attend school. If that is a persistent trend then our estimates of the impact of refugees on the fraction of Turkish attending school are downward biased (recall that the estimates suggest a positive and significant impact).

The placebo tests suggest that our instrument is uncorrelated with pre-existing trends in our employment measures. However, we cannot rule out that during the period 2011 to 2014 significant economic changes, other than the inflow of refugees, occurred in Turkey that happen to be correlated with the instrument. The only such event we were able to identify is the 2012 education reform. This reform, most significantly, adds four years to mandatory schooling, increasing the period from eight years to 12 years. School children in grade 8 (typically age 14) and younger were affected by the reform, making it compulsory for them to continue their schooling. In 2011, our baseline year, Turkey's border regions with Syria had significantly lower school attendance rates among ages 15 – 18, 54 percent compared to 66

percent in the rest of Turkey, and were hence disproportionately affected by the reform. Since the 2012 education reforms coincided with the influx of refugees from Syria and disproportionately affected the same regions, our estimation strategy is potentially confounding the events.

To test whether it is likely that the education reform biases our estimates we check whether the refugee flows are correlated with 2011 levels in school attendance across Turkish subregions. As expected, without the inclusion of distance controls there is a significant, positive correlation between refugee flows and 2011 school attendance levels. However, once we include distance controls refugee flows are completely uncorrelated with 2011 school attendance levels, the point estimate of the correlation is -0.002, the standard error 0.270 (clustered by subregion), and the p-value 0.99. School attendance levels are also uncorrelated with instrumented refugee flows (the p-value is 0.25). This suggests that on account of the inclusion of distance controls we can rule out the 2012 education reform confounding our estimates.

6. RESULTS: WAGES

The previous section showed how the inflow of Syrian refugees resulted in large changes in employment patterns in a NUTS2 subregion, with both the employment rate and the composition of employment changing. Hence, it is difficult to predict what we should expect in terms of the impact of refugees on average wages. Since there is an increase in the labor force, due to the refugees, and a net displacement of Turkish workers we would expect wages to decrease. However, there is also a change in the composition of employment toward observably higher wage jobs (formal and full-time). Finally, since there is a lot of selection on a few observable characteristics there is likely selection on unobservable characteristics. In this section we present estimates of the impact of refugees on average wages. Then we decompose this impact into changes due to the observed composition of the employed, and the remainder due to selection on unobserved characteristics and actual changes in marginal product.

To assess the relative importance of selection, or genuine increases in marginal product, we use a decomposition of mean wages, similar to the semi-parametric version of an Oaxaca-Blinder wage decomposition. Consider a decomposition of the mean wage in Turkey (\bar{w}) in two states of the world, without Syrian refugees ($R = 0$) and with Syrian refugees ($R = 1$). The mean wage is the weighted average of the wage of g groups (w_g), where the weights depend on the number of people in each group (N_g) and the fraction of individuals in that group who are employed (π_g). Specifically,

$$\bar{w}_{R=j} = \frac{\sum_g N_g \pi_{g,R=j} w_{g,R=j}}{\sum_g N_g \pi_{g,R=j}} \quad j = (0,1), \quad (3)$$

where we allow both the employment rate and the wage in each group to depend on the presence of Syrians in Turkey. The change in the mean wage ($\Delta \bar{w} = \bar{w}_{R=1} - \bar{w}_{R=0}$) can be decomposed into two components:²⁶

$$\Delta \bar{w} = \underbrace{\left(\frac{\sum_g N_g \pi_{g,1} \Delta w_g}{E_1} \right)}_{\Delta \bar{w}^U \text{ (Wage Term)}} + \underbrace{\frac{\sum_g N_g \pi_{g,1} w_{g,0}}{\sum_g N_g \pi_{g,1}} - \frac{\sum_g N_g \pi_{g,0} w_{g,0}}{\sum_g N_g \pi_{g,0}}}_{\Delta \bar{w}^X \text{ (Selection Term)}} \quad (4)$$

The second term ($\Delta \bar{w}^X$) is the change in average wages due to changes in the observable composition of the employed (from $\pi_{g,0}$ to $\pi_{g,1}$). The first term ($\Delta \bar{w}^U$) is the part if the change in average wages that cannot be explained by selection on observables, but rather due to changes in marginal product or selection on unobservables.

To empirically implement this decomposition requires estimating $\Delta \bar{w}$ and $\pi_{g,1}$ and calculating $N_g, \pi_{g,0}$ and $w_{g,0}$ using the data in the baseline year 2011 when there are no Syrian refugees in Turkey yet. Finally, the unexplained wage term of the decomposition is the residual $\Delta \bar{w}^U = \Delta \bar{w} - \Delta \bar{w}^X$. A causal interpretation of this decomposition requires estimates of the causal impact of Syrian refugees on mean wages in Turkey ($\Delta \bar{w}$) and the employment probabilities of each group ($\pi_{g,1}$ for all g).

To estimate the impact of Syrian refugees on the employment probabilities of each group, we use an estimating equation equivalent to equation (1). We allow an indicator $E_{irt} = (0,1)$ of whether a person is employed to depend on the ratio of refugees to Turkish people R_{rt} in a subregion r in year t , include region and year fixed effects, δ_r and δ_t , and a fourth-order polynomial of the inverse of the distance to the border $f_t(D_r)$. The following regression is run separately for each group:

$$E_{irt} = \gamma_g R_{rt} + f_{t,g}(D_r) + \delta_{r,g} + \delta_{t,g} + \varepsilon_{irt,g} \quad \forall i \in g, \quad (5)$$

where we categorize people into one of 205 categories defined by their gender, age, education, formal or informal and full- or part-time employment status.²⁷ We estimate equation (5) using

²⁶ Found by adding and subtracting $\frac{\sum_g N_g \pi_{g,1} w_{g,0}}{\sum_g N_g \pi_{g,1}}$ to the expressions for $\Delta \bar{w} = \bar{w}_1 - \bar{w}_0$.

²⁷ The education categories are at most primary school, secondary school, and higher education. The age categories are 15–19, 20–24, 25–29, 30–34, 35–39, 40–44, 45–49, 50–54, 55–59, and 60–64 years. There are 205 categories since no one ages 15 – 19 has completed higher education, and we exclude 27 categories containing less than 40 observations.

two-stage least squares. Then we obtain the predicted employment rate for each group after the inflow of refugees $\hat{\pi}_{g,1} = \pi_{g,0} + 0.020 \hat{\tau}_g$, where 2.0 percent is the mean ratio of refugees to Turkish people in 2014. The wage estimates in Table 8 provide the causal impact of the arrival of refugees on the log wages of employed Turkish workers (with a coefficient $\hat{\gamma}_w$). Then the absolute refugee-induced wage change is given by $\Delta \bar{w} = \bar{w}_1 - \bar{w}_0 = (e^{\hat{\gamma}_w * 2} - 1) * \bar{w}_0$.

Table 8 presents OLS (Panel A) and IV (Panel B) estimates on the impact of refugees on monthly wages.²⁸ In Panel C we present the decomposition of the total average wage change implied by the IV estimates. The columns depict results for different samples: all employed, women, men, formally and informally employed, primary educated, high school completion, and with a higher degree. In our discussion of the wage impact we focus on the IV estimates. The OLS estimates of the wage impact of the Syrian refugees are consistently more negative than the IV estimates, suggesting that refugees tend to locate in subregions with falling average wages.

The IV estimates show the inflow of refugees increasing average wages (column 1) significantly, though the standard errors are large. A significant positive impact of refugees is found among both women (column 2) and men (column 3), for those with formal jobs (column 4), and those with highest educational attainment primary school (column 6) and high school (column 7) completion. There seems to be no impact of refugees on the wages of those with higher degrees (column 8). The positive wage impact of refugees for those employed in formal jobs is consistent with the increase in employment in those jobs (see Table 4b above), since labor supply is likely upward sloping. However, the other positive wage estimates are less easily reconciled with the evidence that refugees displace Turkish workers in those categories (see Tables 3b, 4b and 6 above). The decomposition in Panel C provides insight into the economic mechanisms that underlie these average wage effects.

The first row of Panel C reports the average change in monthly wages in 2011 Turkish Lira, given an increase in the fraction of refugees in Turkey from zero to two percent, as suggested by the IV estimates. The second row reports the predicted impact on average wages due to the

²⁸ The results using hourly wages are qualitatively identical, but the hours measure seems to contain a lot of measurement error, which is why we present the monthly wage results.

Note also, annual regional consumer price indices (CPI) are available for Turkey. We do not use these to deflate wages since we are interested in the marginal product of workers, which depends on producer not consumer prices. From the perspective of welfare of Turkish workers consumer prices are of course important. We test directly whether refugee flows cause changes in the NUTS2 CPI using the empirical specification given by equation (1) above. The point estimates are consistently negative, but never statistically significant.

change in the observed employment composition of a NUTS2 subregion due to the Syrian refugees, the selection term of equation (4) above. The third row reports the residual unexplained wage impact, due to either changes in marginal product or selection on unobserved worker characteristics. On average, due the arrival of the refugees, monthly wages of employed Turkish workers increased between 55 and 107 TL (a substantial \$25 - \$50).²⁹ In the whole sample, monthly earnings increased by around 100 TL (or about 7 percent of average earnings), and about 60 percent of that increase (60 TL) is explained by changes in the observed composition of employed Turkish workers.

The results shown help, albeit partially, to reconcile the displacement of Turkish workers with rising wages. The decomposition is particularly striking for women and informal workers. Female workers on average experienced a 91 TL increase in monthly wages, but the change in observed characteristics explains a 185 TL increase. Hence, women with unchanged characteristics on average experienced substantial wage losses, consistent with their displacement from employment. Similarly, the increase in informal wages (73 TL) are smaller than those predicted by the changes in observable characteristics of those workers (94 TL), consistent with the displacement of informal workers by refugees. Changes in observed characteristics also explain much of the wage gains for those with at most primary education (82 percent), some of the wage gains for men and those who completed high school (29 and 20 percent respectively) and near to none of the wages for those formally employed (5 percent).

7. CONCLUSIONS

This paper combines newly available data on the 2014 distribution of 1.6 million Syrian refugees across subregions of Turkey with the Turkish LFS, to assess the impact on Turkish labor market conditions. Using a novel instrumental variable we find that the refugees, who overwhelmingly do not have work permits, result in the large-scale displacement of informal, low educated, female Turkish workers, especially in agriculture. While there is net displacement, the inflow of refugees also creates higher wage formal jobs allowing for occupational upgrading of Turkish workers, while for women there is also an increase in school attendance. Average Turkish wages rise, primarily as the composition of the employed changes due to the inflow of refugees. In other words, the resulting average wage increase is likely due to the fact that those who would have experienced wage losses as a result of the inflow of refugees exited the labor market.

²⁹ In 2014 a Turkish Lira was about 0.45 US dollars.

Going forward the key issue is how refugees will integrate into the Turkish labor market in the longer term, which will depend partly on whether they seek to remain in Turkey, and whether they are issued work permits that will allow them to work in the formal sector of the economy. To fully assess the potential impact of work permits, allowing the refugees to join the formal labor market, would require an understanding of the skill set of the refugee population. Currently, little is known about the refugees that have arrived in Turkey, making data collection a priority.

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Figure 1



Figure 2
Place of Origin of Syrian Refugees (%)

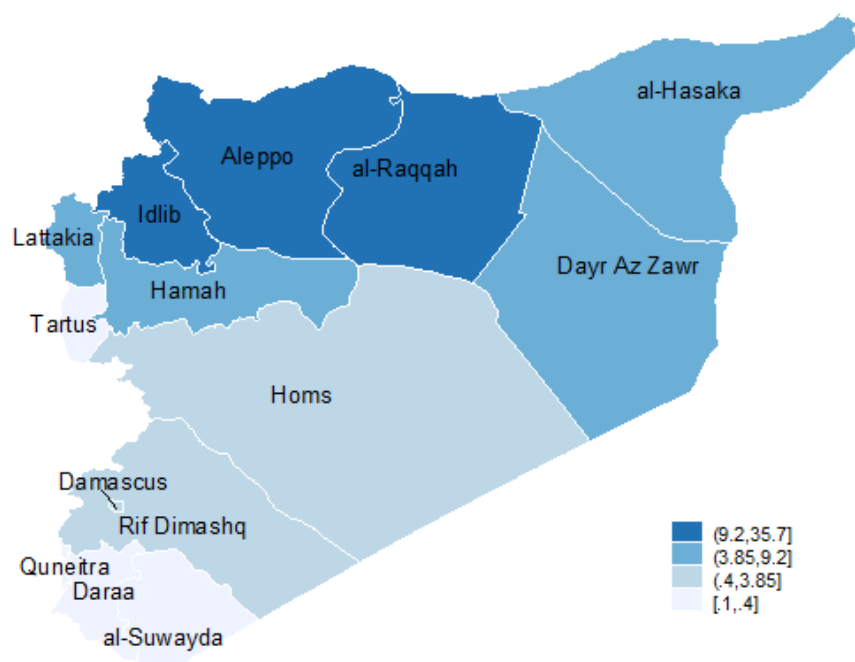


Table 1: Descriptive Statistics for Working-Age Population (in %)

	2011	2014
Employed	41.9	43.6
Unpaid employees	6.6	6.0
Unemployed	5.4	5.5
In school	12.4	15.0
Retired	4.8	4.7
Other Out of Labor force	28.9	25.2
Of the Employed:		
Female	21.7	23.9
Ages 15 - 25	14.3	14.2
Educational Attainment (ages 25 – 64):		
Primary	59.4	55.7
High School	20.5	20.9
Higher Education	20.2	23.4
Job Characteristics:		
Informal	33.0	26.1
Part-time	7.5	7.5
Field	14.3	11.1
Public	14.6	14.2
Self-Employed	21.2	18.5
Employer	5.9	5.1
Mean monthly earnings (TL)	1035	1443
Median monthly earnings (TL)	800	1100
Mean hourly earnings (TL)	5.23	7.49
Median hourly earnings (TL)	3.66	5.17
Working-age Population	47,749,482	49,891,181
Observations	336,949	336,326

Note: All observations are weighted by the LFS sample weights. Earnings are in nominal Turkish Lira.

Table 2: Comparison of Border and Non-Border Subregions (as % of working-age population)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		2011			2014		
	Border	Non-Border	Difference	Border	Non-Border	Difference	Diff-in-Diff
Employed	33.7	43.2	-9.5***	33.2	45.2	-12.0***	-2.5
Unpaid employees	3.8	7.0	-3.2	4.9	6.2	-1.3	1.9
Public employees	5.1	6.3	-1.1	4.9	6.4	-1.5*	-0.4
Unemployed	5.1	5.4	-0.3	7.1	5.3	1.8	2.1
In school	12.4	12.4	0.1	15.0	14.9	0.1	0.0
Retired	2.2	5.2	-3.0***	2.2	5.0	-2.8***	0.1
Formal	15.9	29.9	-14.0***	18.9	34.3	-15.4***	-1.4
Informal	21.6	20.3	1.4	19.3	17.1	2.2	0.8
Full-time	33.2	44.5	-11.3***	34.1	45.6	-11.4***	-0.2
Part-time	4.3	5.7	-1.4	4.0	5.8	-1.8	-0.4
Regular workplace	19.1	27.8	-8.7**	18.9	30.2	-11.3**	-2.5
Field worker	9.8	12.1	-2.3	9.6	10.0	-0.4	1.9
Mean monthly earnings	856	1056	-199***	1143	1475	-332***	-133*
Mean hourly earnings	4.21	5.35	-1.1***	5.74	7.68	-1.9***	-0.8*
Population (in mill)	6.4	41.4	-35.0	6.6	43.3	-36.8	-1.8
Observations	37,611	299,338		44,203	292,123		

Note: All figures are in % of the working-age population. Border regions are Gaziantep, Hatay, Mardin and Sanliurfa. All observations are weighted by the LFS sample weights. Standard errors in columns (3) and (6) are clustered by NUTS2 subregion, and by NUTS2 and year in column (7). *, **, *** denote significance at the 10, 5 and 1 percent significance level.

Table 3a: Impact of Refugees on Native Labor Market Status - OLS Estimates

Panel A. Baseline Covariates						
	Employed	Unpaid	Public	Unemployed	School	Retired
Ref. / Pop.	-0.757	-2.361	0.185	-0.74	0.884	0.099
	-0.709	(0.972)**	(0.286)	(0.526)	(0.477)*	-0.161
R ²	0.3	0.07	0.24	0.03	0.34	0.26
N	673,275	673,275	673,275	673,275	673,275	673,275

Panel B. Full Covariates						
Ref. / Pop.	0.314	0.084	-0.147	0.153	0.329	-0.298
	(0.249)	(0.242)	(0.051)***	(0.163)	(0.119)***	(0.095)***
R ²	0.38	0.08	0.24	0.03	0.34	0.26
N	673,275	673,275	673,275	673,275	673,275	673,275

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. The Baseline specification includes year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. The full specification also includes fully interacted dummy variables for gender, education and year, as well as a gender, education and year-specific second-order polynomial in potential experience. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 3b: Impact of Refugees on Native Labor Market Status - IV Estimates

Panel A. Baseline Covariates						
	Employed	Unpaid	Public	Unemployed	School	Retired
Ref. / Pop.	-1.138	-2.406	0.305	-1.068	0.451	-0.057
	(0.474)**	(1.049)**	(0.238)	(0.493)**	(0.239)*	(0.063)
First-Stage T-Stat	3.55	3.55	3.55	3.55	3.55	3.55
N	673,275	673,275	673,275	673,275	673,275	673,275

Panel B. Full Covariates						
Ref. / Pop.	-1.405	-2.307	0.216	-1.112	0.878	-0.089
	(0.599)**	(0.997)**	(0.207)	(0.513)**	(0.420)**	(0.119)
First-Stage T-Stat	3.58	3.58	3.58	3.58	3.58	3.58
N	673,275	673,275	673,275	673,275	673,275	673,275

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. The Baseline specification includes year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. The full specification also includes fully interacted dummy variables for gender, education and year, as well as a gender, education and year-specific second-order polynomial in potential experience. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 4a: Impact of Refugees on Types of Native Employment -OLS Estimates

Panel A. Baseline Covariates						
	Formal	Informal	Full-time	Part-time	Regular	Field
Ref. / Pop.	1.898 (0.568)***	-4.832 (1.873)***	-0.115 (0.634)	-2.818 (0.890)***	1.467 (0.411)***	-3.986 (1.559)**
R^2	0.38	0.07	0.33	0.03	0.25	0.1
N	673,275	673,275	673,275	673,275	673,275	673,275

Panel B. Full Covariates						
	Formal	Informal	Full-time	Part-time	Regular	Field
Ref. / Pop.	0.622 (0.126)***	-0.224 (0.521)	0.764 (0.189)***	-0.366 (0.431)	0.466 (0.143)***	0.014 (0.454)
R^2	0.38	0.08	0.33	0.03	0.25	0.11
N	673,275	673,275	673,275	673,275	673,275	673,275

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. The Baseline specification includes year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. The full specification also includes fully interacted dummy variables for gender, education and year, as well as a gender, education and year-specific second-order polynomial in potential experience. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 4b: Impact of Refugees on Types of Native Employment - IV Estimates

Panel A. Baseline Covariates						
	Formal	Informal	Full-time	Part-time	Regular	Field
Ref. / Pop.	1.474 (0.555)***	-5.018 (1.926)***	0.211 (0.44)	-3.755 (1.047)***	1.34 (0.433)***	-4.454 (1.731)**
First-Stage T-Stat	3.55	3.55	3.55	3.55	3.55	3.55
N	673,275	673,275	673,275	673,275	673,275	673,275

Panel B. Full Covariates						
	Formal	Informal	Full-time	Part-time	Regular	Field
Ref. / Pop.	1.217 (0.401)***	-4.929 (1.850)***	-0.05 (0.557)	-3.662 (1.008)***	1.149 (0.332)***	-4.335 (1.661)***
First-Stage T-Stat	3.58	3.58	3.58	3.58	3.58	3.58
N	673,275	673,275	673,275	673,275	673,275	673,275

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. The Baseline specification includes year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. The full specification also includes fully interacted dummy variables for gender, education and year, as well as a gender, education and year-specific second-order polynomial in potential experience. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 5: Impact of Refugees by Native Subgroups, IV Estimates

	Employed	Formal	Informal	Regular	Field	School
Female						
Ref. / Pop.	-2.785 (0.887)***	0.113 -0.166	-6.285 (2.281)***	-0.162 (0.205)	-5.715 (2.070)***	1.49 (0.599)**
Male						
Ref. / Pop.	0.041 (0.392)	2.326 (0.756)***	-3.487 (1.442)**	2.493 (0.718)***	-2.89 (1.231)**	0.256 (0.274)
Ages 15 - 24						
Ref. / Pop.	-1.288 (0.754)*	0.762 (0.383)**	-4.872 (2.113)**	0.884 (0.306)***	-4.553 (1.914)**	2.934 (1.212)**
Ages 25 - 64						
Ref. / Pop.	-1.298 (0.487)***	1.417 (0.475)***	-4.794 (1.693)***	1.385 (0.428)***	-4.182 (1.530)***	-0.216 (0.118)*
Primary Education						
Ref. / Pop.	-1.518 (0.507)***	1.497 (0.546)***	-5.601 (1.950)***	1.886 (0.665)***	-5.182 (1.816)***	
High School						
Ref. / Pop.	-1.724 (0.672)**	0.69 (0.321)**	-2.786 (0.873)***	0.544 (0.500)	-1.175 (0.589)**	
Higher Degree						
Ref. / Pop.	0.918 (0.526)*	1.781 (0.608)***	-1.212 (0.485)**	-0.722 (0.858)	-0.093 (0.143)	

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. All specifications include subregion fixed effects, fully interacted dummy variables for gender, education and year, gender, education and year-specific second-order polynomial in potential experience, and a year-specific fourth-order polynomial of the inverse distance to the border. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 6a: Impact of Refugees on Native Relocation Across Provinces - OLS Estimates

	All	Female	Male	Ages 15 - 24	Ages 25 - 64
Panel A: Relocated to Province in Current Year					
Ref. / Pop.	-0.048	-0.064	-0.033	-0.029	-0.066
	(0.025)*	(0.033)*	(0.028)	(0.052)	(0.023)***
<i>N</i>	673,275	343,896	329,379	158,240	515,035
Panel B: Relocated to Province in Current or Past Year					
Ref. / Pop.	-0.086	-0.185	0.013	-0.103	-0.1
	(0.069)	(0.075)**	(0.068)	(0.14)	(0.054)*
<i>N</i>	673,275	343,896	329,379	158,240	515,035

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. All specifications include year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 6b: Impact of Refugees on Native Relocation Across Provinces - IV Estimates

	All	Female	Male	Ages 15 - 24	Ages 25 - 64
Panel A: Relocated to Province in Current Year					
Ref. / Pop.	-0.139	-0.242	-0.034	-0.181	-0.122
	(0.056)**	(0.071)***	(0.050)	(0.091)**	(0.053)**
<i>N</i>	673,275	343,896	329,379	158,240	515,035
Panel B: Relocated to Province in Current or Past Year					
Ref. / Pop.	-0.372	-0.494	-0.249	-0.494	-0.325
	(0.110)***	(0.106)***	(0.119)**	(0.158)***	(0.125)***
<i>N</i>	673,275	343,896	329,379	158,240	515,035

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. All observations are weighted by the LFS sample weights. Standard errors are clustered by NUTS2-year. All specifications include year and subregion fixed effects, as well as a year-specific forth-order polynomial of the inverse distance to the border. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 7: Placebo Tests of Instrument for 2009 - 2011

	Employed	Formal	Informal	School
Panel A.i: OLS Estimates - Without Distance Control				
Ref. / Pop.	-0.01	-0.046	-0.047	0.141
	(0.051)	(0.046)	(0.124)	(0.046)***
R^2	0.01	0.03	0.04	0.00
N	658,287	658,287	658,287	658,287
Panel A.ii: OLS Estimates - With Distance Control				
Ref. / Pop.	-0.195	-0.157	-0.15	-0.086
	(0.23)	(0.168)	(0.314)	(0.097)
R^2	0.01	0.03	0.04	0.00
N	658,287	658,287	658,287	658,287
Panel B.i: IV Estimates - Without Distance control				
Ref. / Pop.	-0.072	-0.195	0.156	0.187
	(0.076)	(0.078)**	(0.151)	(0.057)***
First-Stage T-Stat	6.51	5.65	8.17	6.25
N	658,287	658,287	658,287	658,287
Panel B.ii: IV Estimates - With Distance Control				
Ref. / Pop.	-0.085	-0.309	0.323	-0.604
	(0.413)	(0.235)	(0.777)	(0.288)**
First-Stage T-Stat	3.64	3.43	3.67	3.26
N	658,287	658,287	658,287	658,287

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. Standard errors are clustered by NUTS2-year. *, **, *** denote significance at the 10, 5, 1 percent significance level.

Table 8: Impact of Refugees on Native Wages

	Employ	Female	Male	Formal	Inform	Primary	Second	Higher
Panel A: OLS Estimates								
Ref. / Pop.	-0.99 (0.55)*	-3.07 (0.94)***	-0.23 (0.49)	-0.69 (0.34)**	-2.11 (1.11)*	-1.36 (0.56)**	-0.79 (0.71)	-1.06 (0.30)***
R^2	0.1	0.1	0.12	0.1	0.11	0.14	0.12	0.1
Panel B: IV Estimates								
Ref. / Pop.	4.70 (2.39)**	7.23 (4.29)*	4.57 (2.09)**	2.41 (1.43)*	3.54 (2.28)	4.37 (2.47)*	4.44 (1.85)**	-0.07 (0.10)
First-Stage T-Stat	3.5	3.26	3.56	3.48	3.32	3.62	3.64	3.34
Panel C: Decomposition (in 2011 Turkish Lira)								
Wage Change	101	91	97	55	73	73	107	-8
Amount explained by:								
Observables	61	185	28	3	94	60	21	10
Unexplained	40	-93	69	53	-20	13	86	-18
N	184,143	46,173	137,970	147,568	36,575	73,134	35,589	44,268

Note: the independent variable Ref. / Pop. is the ratio of refugees to working-age population in a NUTS2. Standard errors are clustered by NUTS2-year. In Panel C wage changes are in 2011 Turkish Lira. *, **, *** denote significance at the 10, 5, 1 percent significance level.