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Abstract

We analyze the relationship between large-scale refugee inflows and the inter-regional job mobility of natives. Using a sudden inflow of Syrian refugees into Turkey, we identify the province level impact of hosting refugees on inward and outward job mobility of provinces using administrative social security data. We find that after the arrival of Syrian refugees, net job mobility towards hosting provinces declined. The negative effect is driven by a decline in inward mobility rather than an increase in outward mobility. A percentage point increase in Syrian to native population ratio decreases job mobility to a province by 2%. We find no corresponding effect on total internal migration, suggesting that the effect on job movers in the private sector can differ from the effect on the population at large.

Keywords: Immigration, internal migration, job mobility.
JEL Classifications: J15, J21, J61.

1 Introduction

The Syrian civil war caused a massive outflow of refugees across the world and especially to the neighboring countries. Turkey is the most affected country from the refugee influx and hosts the majority of the refugees. According to UNHCR statistics, 3.6 million Syrian refugees live in Turkey, accounting for 64.5 percent of all Syrian refugees around the world.[1] Such a shock can be expected to have significant effects in Turkish economy and demography. While there is significant debate about the impact of immigration for the economic welfare of natives, the most direct test of natives' own perception of economic and social costs is to test whether they vote with their feet and avoid or move to regions that receive immigrants. An internal migration response can further alter the interpretation of effects on other economic outcomes. In this study, we analyze the effect of Syrian immigrants on native workers' internal migration decisions through job changes.

Majority of existing studies on the economic and employment effects of immigrants on host countries use inter-regional variation in the immigrant intensity. This approach assumes a limited effect from natives' job mobility across regions within the host country. If natives respond to decline in wages or other economic difficulties due to entry of immigrants in a labour market by migrating to other regions, the effect of immigration will be diffused throughout the national economy (Borjas, 2003). In this case, the estimates based on regional variation in immigrant intensity will be biased towards zero. Therefore, it is of critical importance to determine the effects on natives' internal job mobility patterns when interpreting estimates based on cross regional variation.

In order to estimate the effects on internal job mobility between provinces, we exploit the rapid increase in the number of refugees in Turkey after 2013 in a standard difference-in-differences framework. We further correct for refugees' self-selection into provinces by using an instrumental variables (IV) strategy based on

[1] https://data2.unhcr.org/en/situations/syria, retrieved April 12, 2020.

the distance of Turkish provinces to the Syrian border.[2] We employ panel administrative Social Security Institute data that provides information on the employee-employer matches of all private sector Turkish employees between the years 2012 and 2017 to identify job mobility between provinces. We supplement this data with internal migration data provided by Turkish Statistics and aggregate level province data on public employment.

Our results show that refugee intensity in a province reduces net job mobility into that province. The effects on inward and outward job mobility are asymmetric. We find that hosting Syrian refugees in a province deters inward job mobility but does not increase outward job mobility of workers already in the province. The effects are stronger for low income workers, which is in line with the expectation that refugees provide labour that is substitutable with low skilled but not high skilled workers. While net job mobility into a province declines, we find no corresponding effect on total internal migration between provinces. We find evidence that the negative impact on private sector employees' job mobility into hosting provinces is, at least partially, countered by an increase in public employment. Finally, we report an increase in within-province job mobility of native employees in the private sector, which is in line with a reallocation in the labour market in response to the Syrian refugee inflows.

We contribute to the literature on natives' location choices as a response to immigrant flows in three ways. First, we use employee-employer matched data, which enables us to identify job mobility between provinces instead of total migration. A major challenge in studying the impact of immigration on internal migration patterns is the lack of adequate data to identify natives who relocate due to increased competition with immigrant workers. Previous studies use total internal migration figures because of data availability (see (Borjas, 2006); Hatton and Tani (2005): and Mocetti and Porello (2010)). The underlying assumption in

[2]The "distance IV" appears to be becoming a standard in the analysis of the Syrian refugee effects in Turkey. Our approach is similar to that of Aksu et al. (2019). A similar instrument was first used by Del Carpio and Wagner (2015) and variants have since been used in a number of studies.

these analyses is that natives out-migrate due to a fall in economic opportunities. However, migration is not fully fueled by economic motives; local amenities are also important determinants of migration (Partridge, 2010). In addition, some natives may migrate to immigrant concentrated regions due to rise in demand (Hong and Mclaren, 2015). This mechanism is particularly important in the case of Syrian refugees in Turkey as massive amounts of immigrants created considerable additional demand for public and humanitarian services, such as health, education and social assistance. Hence, the estimates using total migration figures may not only reflect the response of native workers to immigration but also include the policy response to the humanitarian needs of refugees. The difference between total migration and job mobility data is highlighted as we find no effects from refugee inflows on the former and significant negative effects from the latter, using exactly the same empirical specification. Second, unlike earlier studies using employment data (see Mouw (2016) and Ortega and Verdugo (2016)), we analyze the effect of immigration on in-migration rates of native workers and we control for the immigrant density of destination regions. There is no study, to the best of our knowledge that takes into account immigrant intensity both in origin and destination regions explicitly while estimating the effects on job mobility rather than internal migration. Finally, unlike most of the existing studies on mobility responses of natives to immigrant influx, we use a large and unexpected influx of refugees which are not motivated by economic factors.[3]

Several papers estimate the internal migration response of natives as a response to immigration with different approaches. Studies that estimate the effects of the difference between the treatment intensity of origin and destination provinces use total internal migration rates to/from regions. For example, Borjas (2006) shows that immigration density in a region has a positive impact on out-migration rate and a negative impact on in-migration rate.[4] Recent studies using employment

[3]Morales (2018) uses a similar shock due to civil war in Colombia. However, he only uses total migration figures and does not control for the immigrant intensity in the destination regions.

[4]Also see Beine and Coulombe (2018) for a more recent example of a study with a similar approach.

data such as Mouw (2016) and Ortega and Verdugo (2016) who analyze the labour market effects of immigration in the US and France test whether native workers decide to move out of the province they are residing in. However, these studies do not analyze inward job mobility to a region. In addition, they do not identify the effects of the difference in treatment intensity between origin and destination province. Another strand of economic literature use the pairwise internal migration figures between regions in order to check whether natives move from immigrant intensive localities to immigrant abundant ones. For example Hatton and Tani (2005) and Mocetti and Porello (2010) use the difference in population share of immigrants in destination and origin regions of native migrants in estimating the net migration rate between two regions. These studies focus on internal migration and implicitly assume that immigrant inflows have a symmetric effect on inflows and outflows of natives.

Our study is also related to the literature on the effects of Syrian refugees in labour markets and economies of host countries, especially Turkey. Several papers examined the effects of Syrian refugees on Turkey's local labour markets. Examples include Del Carpio and Wagner (2015) and Ceritoglu et al. (2017) who analyze the wage and employment effects of Syrian refugees in provinces initially affected by the refugee influx and Bağır (2018) and Aksu et al. (2019) who analyze the effects after refugees were dispersed within the country. In addition to employment and wages, the effects of Syrian refugees on Turkey's regions have been investigated in several dimensions, such as consumer prices (Balkan and Tumen, 2016), firm entry and performance (Akgündüz et al., 2018), school choice (Tumen, 2019) and input choice of firms (Akgündüz and Torun, 2020). Common approach in all of these studies is the comparison of outcomes in refugee intensive regions with others without considering the relocation of native workers in response to refugee influx. Only two studies analyze internal migration of natives after Syrian refugee arrivals. Del Carpio and Wagner (2015) find that Syrian refugee concentration causes native in-migration but they do not analyze out-migration. Aksu et al.

(2019) find that the intensity of Syrian refugees in a region does not have a significant effect on net migration rate of natives except for a positive effect among college graduates Moreover; they find that the number of health personnel increases in refugee affected provinces suggesting that the government responded to the needs of refugees. Neither of these studies analyze job mobility, but rather focus on total migration.

The remainder of the paper is organized as follows. In the next section, we provide a brief discussion on Syrian refugee influx to Turkey. In section 3 we discuss the theoretical literature on the effects of immigration on local labour markets and native relocation. We describe the empirical methodology in section 4 and introduce the data in section 5. We discuss the estimation results in section 6 and conclude with a discussion in section 7.

2 Institutional framework

The first nationwide uprising in Syria started in March 2011 alongside the Arab Spring movement across the Middle East. With the rapid spread of the protests across the country, the government's attitude became increasingly harsh and the conflict turned into a civil war as of May 2011. Intensifying clashes between the protesters and the government forces in Northern Syria gave rise to the first refugee crisis in June 2011 as 10,000 Syrian refugees fled into Turkey. Since then, more than 5.6 million Syrians fled to the neighboring countries including Turkey according to the United Nations estimates (OCHA).

Turkey has the longest land border with Syria and is located to the north of Syria where the armed clashes were most intense. This made Turkey the largest refugee destination during the Syrian Civil War. Turkey followed an open border policy for all the victims of the conflict since the beginning of the Civil War and responded to the refugee influx by building refugee camps and introducing an identity checking system. However, the government had to relax the controls

and allow refugees entering into the inner provinces as the refugee numbers grew beyond the capacity of the camps, which at the time was around 250 thousands. Although Syrian refugees are still concentrated in the bordering provinces, they constitute a considerable share of population in some inner provinces (figure 1). The total number of registered refugees reached 3.5 million by the end of 2017 and stabilized since then according to the official statistics published by the Ministry of Interior in Turkey. The yearly increase in the number of refugees, on which we base our identification strategy, can be found in figure 2. The number of refugees was limited in 2012-2013 but rapidly rose in 2014 and 2015. The refugee inflow continued at a slower pace until 2017.

A specific agency, the Directorate General of Migration Management, was established under the Ministry of Interior to administer the migration affairs and the Syrian Refugees are granted a temporary protection status in April 2013. The temporary protection status provides free access to all public education and health services in Turkey and requires a biometric registration by all household members. The biometric registration has since made the counting of Syrian refugees in Turkey more reliable both at the aggregate and province level. The temporary protection status does not cover a work permit but many Syrians work informally mainly in unskilled labour-intensive sectors.

The official statistics about the demographics of Syrians in Turkey has not been published yet but a comprehensive field survey conducted by the Disaster and Emergency Management Authority (AFAD) in 2013 provides detailed information about the demographics and migration routes of the refugees in Turkey. The survey results indicate that most of the Syrian refugees came from the Syrian provinces close to the Turkish border. The 80% of the respondents declared the ease of transportation as the main factor in selecting Turkey as a safe destination and only about 55% of refugees said they entered the country via official entrance points. This information is valuable in addressing the concerns about the endogenous selection of destination by the refugees both across the countries and within

the country, which we will discuss in more detail in our identification strategy. The AFAD survey also provides significant information about the distribution of refugees between the camps and provinces at early stages of the influx. The survey results suggest that a vast majority of the refugees were living in the refugee camps as of early 2013 and those refugees living outside of the camps had much better preexisting income than the refugees in the camps (AFAD, 2013). We can therefore conclude that the Syrian refugees in Turkey were largely concentrated in camps and had a limited effect on the native labour market before 2013.

The survey results indicate that 60% of the refugees are between the ages of 13 and 54, implying a large working age refugee influx. Overall, the Syrian refugees have lower educational attainment than the Turkish natives and the female labour force participation is very low. During the survey period, only 8% of males and 3% of females declared that they had been working in the last month (AFAD, 2013). Very low levels of employment at early stages of the influx was probably due to the temporary perception of the displacement.

As of 2019, only about 35 thousand Syrian refugees are granted with work permits in Turkey. However, a recent survey conducted by Turkish Red Crescent and World Food Programme with 413,025 Syrian households, approximately 2.2 million people, in 2018 reveals that the majority of Syrian refugees work informally in Turkey. The survey results show that 84% of refugee households had at least one individual who is working and only 3% of those working were holding a work permit. According to the survey, only 37% of the refugees in Turkey hold a middle school or above degree and Turkish language skills remain low such that 80% of them had beginner level and only 3% of them had advanced level Turkish language skills. The vast majority of the refugees are employed at jobs requiring elementary skills. 20% of the employed were working in unskilled services, 19% were working in the textile industry, 12% were working in construction, and 10% were working as artisans (WFP – TRC, 2019).

3 Literature and theory

In standard economic models, immigrants affect the labour market mainly through increase in the labour supply in the local labour market (Edo, 2019). In the simple canonical model with homogeneous labour, fixed level of capital and technology, and geographically closed labour market, influx of immigrants in a locality will increase the labour supply and create downward pressure on wages. If wages are not downwardly flexible, some of native workers may leave the labour market or become unemployed even if total employment increases in the region. The assumptions of the canonical model are restrictive and multiple extensions have been introduced including firm and native labour force adjustments (Peri, 2016). Geographic mobility in particular is a margin for adjustment of native workers, which is the focus of our study.

Native workers can move out of a local labour market (or prefer not to move in) if their skills are substitutes with those of immigrants until native wages or employment opportunities are equalized across regions. This mechanism will attenuate the local labour market effects of immigration. Larger the native internal migration response, greater will be the difference between the national effect of immigrants and the estimates based on inter-regional comparison. In order to assess the importance of native mobility as an adjustment margin, Borjas (2006) constructed a formal model of native migration in response to immigrant influx and empirically estimated it with the US data.

The Borjas model provides a framework for the joint determination of regional wages and internal migration decision of native workers. Assuming market clearing flexible wages, the model reduces the economic loss of native workers to wage reduction without considering the unemployment effects of immigration. However, the essence of the model does not change if unemployment is taken into account. The model further assumes that local labour demand depends only on wage rate and local demand, which is assumed to be fixed for a given wage rate. In

such a setting, immigrants will unambiguously lower the local wage level. Therefore, in the Borjas model, migration decisions of native workers depend on two parameters; wage loss due to immigrants and migration supply elasticity. The wage loss is the difference between the regional wage rate observed shortly after the influx of immigrants and the equilibrium wages that will be observed nationally once all mobility responses to immigrant influx have been made. Higher the wage loss, more natives in the immigrant intensive regions will out-migrate and less natives will in-migrate. The degree of wage loss will depend on labour market and immigrant characteristics.

The second parameter in the model is supply elasticity of native workers with respect to wage loss due to immigration. Various factors, such as migration costs or short-term liquidity constraints may dampen the supply elasticity and if the elasticity is sufficiently low, the out-migration response of natives may not be completed in the short run but can be realized after a sufficiently long period. On the other hand, the effect of immigration on relocation decisions of native workers in other regions can be observed shortly since the costs of migration do not apply for them.

The simple framework of Borjas (2006) can be extended in several ways. First, as Borjas (2006) acknowledges, regional wage disparities and hence internal mobility of workers might have existed before the immigrant influx. Hence, pre-immigration trends should be taken into account when estimating the impact of immigration on native mobility. Second, immigrants may induce relocation of natives with other channels other than the wage (and/or unemployment) effects, such as through the housing market, congestion effects or self-selected ethnic segregation effects (Hatton and Tani, 2005). Therefore, total migration figures may not provide the estimates of native workers' response to the increase in labour supply due to immigration. Finally, the assumption that local labour demand is constant with a given wage level may be too strong. Hong and McLaren (2015) develops a model on demand effects of immigrants where labour demand in non-tradable

industries (services) increases with local population for given wages. Hence, immigrants may not only increase labour supply but they may also shift the labour demand curve upwards. In that case, immigrant influx may create new jobs for natives as well.

In summary, Syrian refugees can be both push and pull factors for inter-regional job mobility of natives in Turkey. Native workers may decide to out-migrate from or decide not to migrate to refugee intensive provinces due to increased competition in the labour market. On the other hand, there may be other mechanisms that could have a positive effect on net job mobility of hosting regions. In particular, in the case of Syrian refugees in Turkey, additional demand for public or humanitarian services created by refugees may trigger in-migration of public employees or NGO volunteers to the provinces mostly affected by refugee influx.

4 Methodology

We exploit the rapid inflow of Syrian refugees as a natural experiment to analyze the effects on job mobility between Turkish provinces. The flow of displaced Syrian refugees as a share of local population in each province generates cross sectional variation across provinces in each year. The effects of the rapid inflow can then be estimated using a difference-in-differences (DD) framework. Since we are interested in the flow of jobs between provinces, the treatment variation is at the province pair level. The treatment variable can then be defined as the difference between the Syrian to population ratios of destination and origin provinces. The basic form of a specification with the pairwise treatment is shown in equation 1, where subscript i denotes the origin province and subscript j denotes the destination province. The outcome variable of interest is given as y_{it}, which is defined as the log of the total number of job flows from province i to j. We exclude within province mobility thus have 81*80 pairs (observations annually). We are interested in the estimated parameter β, which shows the effect of an increase

in the Syrian refugee to population ratio in the destination province compared to the origin province.[5] Equation 1 further includes controls for pair-specific fixed effects, α_{ij}, and time fixed effects, T_t. In the baseline analysis, we present results from an alternative specification where we relax the pair-specific fixed effects to separate destination and origin specific fixed effects. Pair-specific fixed effects are preferred since job mobility from a given origin province can be heterogeneous across destination provinces. Depending on whether the regression is estimated using quarterly or yearly data, subscript t denotes each time period included in the analysis.

$$y_{ijt} = a_0 + \beta(Ratio_{jt} - Ratio_{it}) + \alpha_{ij} + T_t + e_{ijt} \quad \text{for} \quad i \neq j \tag{1}$$

Using the difference between the refugee to population ratios of destination and origin provinces implicitly makes the assumption that refugee inflows have a symmetric effect on inflows and outflows of native jobs. We relax this assumption by separately estimating the effects of Syrian refugee ratios in destination and origin provinces in equation 2. We are now interested in parameters β and γ, which show the effects on refugee inflows in destination and origin provinces respectively. If the effects are indeed symmetric, we would expect the estimates for β and γ to be the same size with opposite signs.

$$y_{ijt} = a_0 + \beta Ratio_{jt} + \gamma Ratio_{it} + \alpha_{ij} + T_t + e_{ijt} \quad \text{for} \quad i \neq j \tag{2}$$

Turkish provinces have historically differed considerably in wealth, employment opportunities and internal migration patterns (Gezici and Keskin, 2005). The crucial assumption in difference-in-differences (DD) set-ups is the parallel trends assumption across provinces with different treatment intensities. To relax this assumption, we introduce linear trends at the destination-origin level to our spec-

[5] In this setup, we implicitly assume that the stable unit treatment value assumption (SUTVA) holds; that is in-migration or out-migration dynamics in a province is not affected by the refugee inflow in another province. This assumption may not hold over the entire adjustment path due to spillover effects in the local labor markets. However, we believe that this is not a major concern in our study because our period of analysis can be considered short-run for analysis of migration decisions since migration decision will be given after observing labor market effects.

ifications. We use alternative trends by also testing specifications with separate origin and destination specific time trends.[6]

While timing of the violently displaced inflows can be plausibly argued to be exogenous to hosting country economic conditions, refugees' choice to settle in a particular location within the hosting country may favor provinces with stronger economic conditions. While Syrian refugees in Turkey were largely concentrated around the Syrian-Turkish border provinces until late 2014, they have since spread across Turkish provinces (Tumen, 2016). It seems particularly plausible that the refugees' location choice would be correlated with job inflows into a province. Therefore, we provide IV estimates for all our outcomes where we instrument the ratio of Syrian refugees in a province. We use a distance based instrument which was first introduced by Del Carpio and Wagner (2015) and later modified by Aksu et al. (2019).

The IV approach of Aksu et al. (2019) that we adopt is shown in equation (3). The instrument takes into account the potential options of Syrian refugees to move to all neighboring countries to Syria. The instrument, $IV_{p,t}$ is defined as the expected Syrian refugee number in Turkish province p at time t while $d_{s,X}$ for $X = T, L, J, I$ is the minimum distance of each Syrian province to any of the four points in the border of the neighboring countries which are Turkey, Lebanon, Jordan, and Iraq. Note that there are 12 provinces in Syria, denoted by s. π_s is the pre-war population share of Syrian province s and T_t stands for the sum of the number of refugees in the four neighbors of Syria. T_t is an approximation to the total number of refugees exiting Syria given that the number of refugees in other countries during the period of analysis was limited. Finally, $d_{p,s}$ is the distance of any given Turkish province p to Syrian province s.

$$IV_{p,t} = \sum_{s=1}^{12} \frac{\frac{1}{d_{s,T}}\pi_s}{\frac{1}{d_{s,T}} + \frac{1}{d_{s,L}} + \frac{1}{d_{s,J}} + \frac{1}{d_{s,I}}} \frac{T_t}{d_{p,s}} \tag{3}$$

[6]Recent literature on the impact of Syrian refugees in Turkey have shown that controlling for province trends can significantly alter the results: see Tumen (2019) for education outcomes, Aksu et al. (2019) for labour market outcomes and Akgunduz and Torun (2020) for firm inputs.

In specifications where we use the difference between the ratio of Syrian refugees in destination and origin provinces, we instrument that difference using the difference in the province level instrument, $(IV_{j,t} - IV_{i,t})$ as the instrument. When we estimate the effect of inflows separately, we instrument destination and origin ratios separately by the corresponding province's instrument. All our instruments are highly statistically significant in the first-stage. The instrument for pair difference has an F-statistic of 106, the instruments for destination and origin provinces have an F-statistic of 37. The F-statistics are even larger if we do not include time trends. If time trends are excluded and only year and province fixed effects are controlled for, the pair difference instrument has a first stage F-statistic of 452 and the separate origin and province instruments have a first stage F-statistic of 133.

It is well known that difference-in-differences (DD) analyses can result in over-rejections of the null hypothesis (Bertrand et al. 2004). Since our analyses are at the origin-destination pair level, we cluster all our standard errors at that level as well. Observations are already aggregated at the origin-destination-time level, which should further limit overrejection issues. We estimate an average effect for the population by weighting each pair observation by the period mean of the total employment of destination and origin provinces. Results from alternative weighting approaches are reported as robustness tests.

5 Data

5.1 Data sources

The data we use in this study comes from multiple sources and is constructed for the period between 2012 and 2017.[7] The annual Syrian Refugee numbers at province level for 2015 and after are retrieved from the annual reports of the Directorate General of Migration Management. We compiled the Syrian refugee numbers for years before 2015 from several press releases shared by the Ministry of

[7]While the EIS data covers the period starting from 2006, the Social Security data allows the tracking of individuals beginning in 2012.

Interior with news agencies since there is no published official statistics for that period. Our primary dependent variable is the ratio of Syrian refugees to natives in each province, where the numbers of natives in each province is obtained from Turkish Statistics.

We defined the mobility across provinces in two ways, the mobility of the total population and the mobility of the registered employees. The annual mobility of the total population between provinces during the sample period is obtained from the publicly available annual Address-based Population Registration System (ABPRS) results published by the Turkstat. ABPRS monitors population related to permanent residence and population movements on a regular basis. Turkstat has produced entire information related to population demographics from ABPRS since 2007. The ABPRS requires all citizens to physically inform the government agencies with eligible proofs in case of residency change within 20 work days. There is a fine for late notification of the address change. Some local public services such as school registration are also linked to the official residency address. Thus, the ABPRS data reflects the real-time internal migration in Turkey to a great extent. Internal migration is defined "as changes in usual residence addresses of population within one year in the specific areas (region, province, district, etc.) inside the country" by Turkstat. We use data for the years 2012 to 2017 from ABPRS to make the results for total migration consistent with the job mobility results.

The labour mobility numbers, on the other hand, is not readily available and requires a matched employer-employee data set for which we used the Entrepreneur Information System (EIS) maintained by the Ministry of Industry and Technology of Turkey. The EIS brings together confidential administrative data sets from multiple sources. We have used the employee level quarterly Social Security Institution (SSI) records to follow the workers overtime across establishments between 2012 and 2017. The SSI data in the EIS is available for each quarter for all employees in non-financial and private sectors of the Turkish economy. The dataset includes information on the identity of employees, the identity of establishments,

daily wages, the number of days worked in the last month of a quarter, and the gender and age of employees. Labour market transitions of employees can therefore be observed on a quarterly basis. We defined worker mobility for all employees who switched jobs between two paid jobs in different provinces between two quarters from $t-1$ to t. To avoid double counting, we excluded employees who had worked for less than 30 days in a given month. We also had to drop all observations with missing data on gender, wage and age outcomes. Overall, these exclusions make up less than 1% of the private sector employment population. We finally take the average of the quarters to have an annual average for the mobility since our baseline regressions are at year level. Since our data starts in 2012, we cannot construct job mobility for the first quarter of 2012. We therefore use the average of the other three quarters when calculating annual job mobility. The summary statistics of the variables we constructed to measure inter-regional mobility can be found in table 1. We use the log of the number of native migrants as our dependent variable throughout the analysis. Around 1.5% of the province pair cells between 2012 and 2017 are equal to 0 in the job mobility dataset. To avoid dropping these observations and causing selection issues, all variables are transformed using the $log(x+1)$ formula.

We generate four subsamples to test whether there are heterogeneous effects by wage (low and high) or experience (young and old). Low wage workers are defined as those who have a wage that is equal to or below the median in the province they are employed in quarter $t-1$. High income workers earn wages above the median level. The median level in a province is generally close to the national minimum wage, which is strongly binding in Turkey. We further define young employees as those who are aged between 15 and 29 and old employees as those aged 30 and above.

To be able to interpret the results on job mobility, it is important to understand the coverage of the EIS data. In 2015, Turkstat reports that there were around 26.5 million employed individuals across Turkey. Around 3 million work in the public

sector while 9 million work informally. Of the remaining 14.5 million, the EIS data allows us to observe around 12 million individuals per quarter. The remaining 2.5 million are presumably made up of self-employed (including farmers) and wage earners in the finance sector that are not included in the EIS data.[8]

5.2 Trends in Syrian refugee influx and job mobility

Figures 3 and 4 map the geographic variation in inward and outward mobility of employment. A common theme emerges in both figures. As a fraction of total formal employment, the number of workers moving into a province or out of a province is higher in eastern Turkey. Comparatively, larger Western cities like Istanbul have lower inward and outward job mobility. There is little evidence of a general trend in job mobility towards Western cities. Instead, job mobility levels between provinces is highest for provinces with comparatively small labour markets.

Figure 5 shows total job mobility across provinces by year. In line with the increase in employment, there is a general increasing trend in the number of employees who switch jobs across provinces. The one exception to the trend is 2016, when minimum wages were raised by 30% in January and there was general macroeconomic slowdown due to the coup d'etat attempt on the 15th of July. Both of these factors may have contributed to the temporary decline in job mobility in 2016.

Figure 6 plots the log difference between inward and outward job mobility for the three largest Turkish cities: Istanbul, Ankara and Izmir. Net job mobility is on average equal to zero in Turkey by definition. While there is no discernible trend for Ankara and Izmir, net job mobility to Istanbul appears to decline after 2014. This decline coincides with the spread of Syrian refugees from the border regions where refugee camps were located to the rest of Turkey. Istanbul was in fact hosting the largest number of Syrian refugees by 2015. Comparatively, Ankara and

[8]The fact that our data does not include the finance sector is unlikely to affect any of our results. According to data from the Banks Association of Turkey, total employment in banks increased by about 7 thousand from roughly 185 thousand to 193 thousand between 2012 and 2017. The increase in most refugee affected provinces (Hatay, Gaziantep and Sanliurfa) was about 500.

Izmir had low number of Syrian refugees (relative to their population) throughout the sample period.

While the decline in net job mobility to Istanbul coincides with the arrival of Syrian refugees in 2014, the size of Istanbul makes it difficult to rule out other explanations for the decline. In figure 7, we plot the three provinces with the highest number of Syrian refugees between 2015 and 2017 after Istanbul: Hatay, Gaziantep and Sanliurfa. All three provinces are located in the Southeastern region of Turkey close to the Syrian border and therefore had a spike in the number of refugees starting in 2013. The net job mobility trends in these host provinces, suggests a negative impact from the arrival of Syrian refugees. In all three provinces, net job mobility is positive in 2012, declines to zero in 2013 and turns negative between 2014 2016. It only recovers in 2017, when the number of Syrian refugees across Turkey had largely stabilized.

6 Results

6.1 Impact on job mobility

Table 2 shows the results of the analysis on job-to-job mobility between provinces. In panels A and B, we present the results using a single treatment variable defined as the difference between the destination and origin province Syrian to population ratios. The first two columns in both panels show no statistically significant effects. However, once we include destination and origin or pair-specific time trends in columns 3 to 5, the effect sizes become larger and statistically significant. The effect is particularly large in panel B's IV estimates. The stronger effect from IV estimates and the increase in effect size after including province trends suggest that Syrian refugees moved to provinces that had a positive trend in receiving native job migrants. Once we control for pair specific trends and instrument the ratio variable, we find that a percentage point increase in the difference between a given destination and origin provinces' Syrian to population ratio decreases job

mobility to the province by 1.2%.

In panels C and D, we allow for asymmetric effects from the Syrian to population ratio of destination and origin provinces. The preferred IV estimates in columns 3 to 5 suggest that the effect is largely driven by Syrian inflows into destination provinces. When a province's Syrian to population ratio increases by one percentage point, the job mobility to that province decreases by 2%. While the origin effects are in the opposite direction and positive, they do not appear to be statistically significant in panel D. The effects appear to be driven by a decline in job mobility to rather than an increase in job mobility from provinces hosting Syrians. The effect on inward job mobility is consistent with the hypothesis that refugees increase labour market competition and reduce the employment prospects of native workers. On the other hand, we find no effect on outward job mobility, suggesting that the costs imposed on natives by refugee workers are not high enough to justify moving to a new province.

In table 3, we present the heterogeneous effects of Syrian refugees on the job mobility of four groups: low income, high income, young and old. We only present estimates from specifications with pair-specific time trends, which is equivalent to column 4 in table 2. The effects appear to be particularly strong for low income workers, whose job mobility to a province declines by 2% in response to an increase in the destination Syrian to population ratio of one percentage point. There is also a slightly stronger effect for young workers compared to old workers but this difference is not statistically significant. The stronger effect on lower income workers is in line with the prediction that Syrians are largely a substitute for low skilled workers.

How big is the effect on job mobility and can it influence the estimates for effects of Syrian refugee inflows on native employment in Turkey? We can provide an approximate answer to this question with a back of the envelope calculation. Using the estimates in table 2, we know that job mobility to refugee hosting provinces declines by 2% for each percentage point increase in the Syrian refugees to pop-

ulation ratios of the destination provinces. Since our estimates are weighted by total employment of destination and origin provinces, we employ these estimates as population average effects for Turkey. The ratio of the number of employees migrating to a destination province in a year to the total number of employees in that province is around 10% for the period 2012 to 2017. Accordingly, a 2% decrease in labour mobility in response to a percentage point increase in the Syrian refugees to population ratio will reduce the total number of employees in a province by 0.2%. This effect is as large as the effects on native employment estimated by Aksu et al. (2019) and Akgündüz and Torun (2020).[9] Assuming that all job mobility to a province displaces native workers in that province, we would expect a significant rise on the previously estimated negative effects if there had been no impact on job mobility between provinces.

To further define the size of the effect, we estimated specifications where we change the dependent and independent variables to actual number of job movers and the number of Syrian refugees (in thousands) respectively. Table A1 shows the results of this exercise. Since job mobility has a large standard deviation when it is not log transformed, the estimates are less precise and we therefore show results where Istanbul is excluded as a destination or origin province in columns 3 and 4. The coefficient estimate becomes more precise and statistically significant, but also smaller once Istanbul is excluded. Based on the estimates in column 1 and 2 where Istanbul is included in the sample, hosting 1000 refugees reduces inward migration to a destination by 2.25 from each province. Given that there are 80 potential origin provinces, we can conclude that hosting 1000 refugees reduces job inflows by 180 employees. When Istanbul is excluded, the corresponding effect is 34 fewer job movers per 1000 refugees in columns 3 and 4.

[9]This calculation assumes that all private employment would be affected the same as the sample we observe in the SSI data. If informal employees are affected more, the effects would be larger. The effect we estimate is more likely to be a conservative estimate given that the employment effects using survey data find a larger displacement effect for informal employment.

6.2 Impact on total migration

Table 4 reproduces the results we presented in table 2 on job mobility for internal migration. Strikingly, there appears to be no effects on total migration. Our results on job mobility suggest that the inflow of refugees reduces the number of private sector workers who move into a province, while indicating no overall effect on internal migration.[10]

To reconcile the differences in effects on job mobility and internal migration, there must be a counter effect to another group to increase internal migration to provinces hosting refugees. There are four potential groups that might move towards provinces hosting refugees and who are not included in the private sector job mobility we analyze in section 6.1. First, public employees may be assigned to provinces hosting refugees to increase education, social protection and health care capacity. In fact, Tumen (2019) reports increased allocation of education resources to provinces hosting refugees. Second, employees in aid organizations who are not directly registered in the social security system may have moved to hosting provinces as aid organizations became active in hosting provinces soon after the refugee inflow began.[11] Third, some natives may have moved to hosting regions to look for informal jobs. However, migration in this direction is likely to be limited since adverse labour market impacts of immigrants are mostly found among informal workers (Ceritoglu et al., 2017; Aksu et al., 2019). Fourth, Akgündüz et al. (2018) and Altındağ et al. (2020) suggest increased economic activity in provinces hosting refugees and self-employed and business owners may therefore move to hosting provinces.

The largest among these three groups is public employees, who numbered at around 3 million during the period of analysis. We formally test whether there is an increase in public employment in table 5, where we regress the log of public

[10] Since private sector employment is about 15% of the total Turkish population during the period of analysis, we would expect the estimated coefficients for total migration to be 15% of the job mobility coefficients as a lower bound.

[11] International Organizations under cooperation of UN High Commissioner for Refugees spent 3.3 billion dollars for the Syrian refugees in Turkey. Source: https://data2.unhcr.org/en/situations/syria/location/113, retrieved May 11, 2020

employment in a province on the ratio of Syrian refugees to population between 2012 and 2017. We find a statistically significant and positive effect in column 1 where no regional trends are controlled for. In column 2, where we introduce 26 NUTS-2 level time trends, the IV estimate remains large and statistically significant. A percentage point increase in Syrian to population ratio is estimated to raise public employment in the province by 0.25%. In column 3, where we include province level time trends, the effects turn statistically insignificant but remain positive and the point estimates are larger than in column 2. Since column 3 includes 81 province level time trends, the loss of significance may simply be due to the restrictiveness of the specification. The suggested increase in public employment in hosting provinces may then have a counter effect to the effects on private sector job mobility and explain the lack of effects on total internal migration. Our results are in line with (Aksu et al., 2019) who find that refugee influx increases the net migration rate of college graduates and the number of health professionals across 26 NUTS-2 regions of Turkey.[12]

6.3 Impact on within province job mobility

So far, we have only focused on job mobility between provinces. Table 6 shows results where we estimate the effects of the Syrian refugee to population ratio on total job-to-job moves within a province. The results confirm that there is a considerable effect on job reallocation within a province in response to the arrival of Syrian refugees. According to panel B, which shows the IV estimates, a percentage point increase in the Syrian to population ratio of a province raises job mobility within a province by 2%. This effect is largely driven by high income workers, where the effect size is 5%. Increased job reallocation is in line with a heterogeneous effect of Syrian refugees on the productivity and demand for different skill groups and occupations. While out of province job arrivals are reduced, natives

[12]The share of college graduates among public employees is 72 percent, much higher than the wage earners in non-agricultural industries (21 percent) as of 2017. Hence, positive relation between refugee intensity and in-migration of college graduates can indirectly imply the in-migration of public employees.

already in a province hosting refugees appear to be changing jobs within their province rather than moving out of their provinces.

6.4 Robustness tests

We ran a battery of tests to check the robustness of our results in table 7. These range from changing the weights to using alternative instruments. Column 1 of table 7 replicates the our baseline specification for comparison.

6.4.1 Weights and restricted sample

In column 2, we use the origin province average employment size over the sample period as an alternative weight to the pair employment size. The coefficient for origin ratio in panel D turns out to be positive and statistically significant while the destination ratio coefficient remains similar. The IV results are in line with the baseline results with a larger magnitude. In column 3, we omit the weights as in column 2, but restrict the sample to pairs with a mean origin-destination employment mean of 50,000. As expected, the effects are closer to our baseline weighted estimates.

6.4.2 Controlling for minimum wages

As previously noted in section 5, there was a large minimum wage hike in Turkey in January 2016. While minimum wages are increased at the beginning of each year, the regular adjustment is close to the inflation figures. In 2016, the nominal increase was 30%, which corresponds to the largest hike in the last decade. In column 5, we explicitly test whether the 2016 change in minimum wages affects our estimates by including a treatment variable equal to 0 until 2016 and the 2015 share of employees with minimum wages in destination and origin provinces in 2016 and 2017. The results change little compared to our baseline estimates.

6.4.3 Long differences

While our baseline specification estimates the immediate response to a rise in the number of Syrian refugees, the adjustment in internal job to job mobility may take longer. In column 6, we estimate the baseline model in first differences with overlapping two year differences. This allows for the impact of the Syrian refugee inflows to take longer, but the estimates are essentially the same as our baseline estimates. This result seems unsurprising since the cross-province variation in Syrian refugee numbers remains fairly consistent over the years. In fact, the correlation coefficient across 2013-2017 of province level Syrian distribution is uniformly above 0.85.

6.4.4 Alternative instrument

While our preferred baseline instrument exploits the variation in the number of Syrian refugees across provinces according to the distance of each province from Syria, there are alternative instrumental variables in the literature. In particular, Altındağ et al. (2020) use the ratio of Arabic speakers to total population in each province according to the 1965 census to generate an instrument.[13] The share of Arabic speakers is then multiplied by the number of Syrian refugees displaced outside of Syria in each year to account for the rise in the number of refugees over the years. We use this instrument to estimate the effects in column 7. The results suggest that, if anything, the estimates from the distance based instrument are conservative. The effect size for the single treatment is more than twice as large while the origin effect becomes large and statistically significant for the separate treatment. The destination province effect also becomes larger, though the increase in size is only about 30%.

[13]Some Nuts-3 provinces did not exist in 1965. For such provinces, we used the share of Arabic speakers of the province that they were a part of in 1965.

6.4.5 Quarterly data

As a final robustness test, we estimated the effects using quarterly job mobility data between the second quarter of 2012 and the fourth quarter of 2017. The results are presented analogously to table 2 in table 8. Quarterly estimation has two advantages. First, it obviously exploits more data as the number of observations nearly quadruples. Second, quarterly data allows for a more precise estimation of pairwise and province level time trends. On the other hand, our data on the Syrian refugee distributions is only available annually, and our treatment variable therefore varies at the annual level. This is an obvious cause for measurement error, which may lead to a bias in estimates towards zero. Nevertheless, the IV approach may limit the impact of the measurement error on the consistency of the results. In fact, the results appear to be similar to our baseline annual results in table 2. One key difference is that in panel D, we find a statistically significant and positive effect on outward job mobility as a result Syrian refugee inflows in a province. While these estimates are positive in the annual estimations, they are not statistically significant except when an alternative instrument based on the historical share of Arabic speakers is used. As such, it seems prudent to interpret these estimates carefully. Consistent with the baseline results, quarterly estimates also show larger effects from destination province Syrian to population ratios, indicating that the effect is largely driven by a decline in job mobility to provinces hosting Syrian refugees.

7 Conclusion

In this paper, we investigate the relocation effects of immigrants on natives using large and unexpected influx of refugees to Turkey due to the civil war in Syria. If native workers relocate as a response to immigrant influx, estimates of labour market impacts of immigrants based on regional variation may be attenuated. Hence, our study complements the recent literature on the labour market effects of Syrian

refugees. Our novel dataset constructed from employee-employer matched social security records records allows for reliable identification of job mobility, which is a first in the study of the effects of Syrian refugees in the MENA region.

Although the theoretical framework depends mostly on labour supply effects of immigrants, most of the empirical literature uses total internal migration figures due to lack of data. We use an employee-employer dataset that provides us with the information on the inter-regional movement of native workers instead of total migration and find significantly different results between total migration and private sector job mobility effects.

Native private sector employees reduce their inter-regional job mobility to provinces with dense Syrian refugee populations. Relocation responses are stronger among low-income employees as refugees are mostly substitutes to these workers. The estimated effects on the labour market outcomes of natives in hosting regions using cross-regional variation may therefore be underestimating the total effect of the refugees. In addition, we explore the within job mobility in response to the refugee influx and find that within job mobility in host provinces increase only among high-income native workers. Given that job change is a way of career development and wage increase, our results on within province job mobility are in line with the previous literature which found that skilled workers may have benefited from refugee influx.

We find no impact from refugee influx on total internal migration in the same methodological set-up that we use to analyze inter-regional job mobility. The results on overall internal migration effects of refugee inflows may not only reveal the native workers' relocation response but may also include the policy response to the needs of refugees. Earlier evidence suggest that the number of health personnel increased in refugee hosting regions. Our analysis on public employment supports this evidence; we find that public employment increased in refugee hosting provinces. The lack of an effect on total internal migration due to the policy response in the context of Syrian refugees in Turkey highlights the importance of

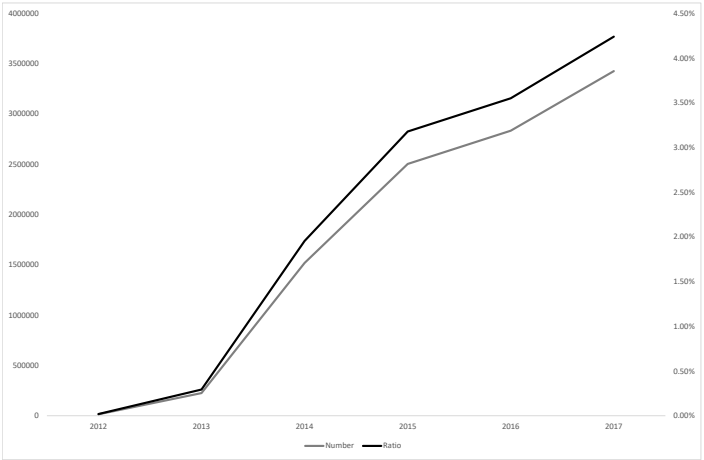
interpreting evidence drawn from different contexts carefully.

Figures

Figure 1: Syrian refugees to population ratio

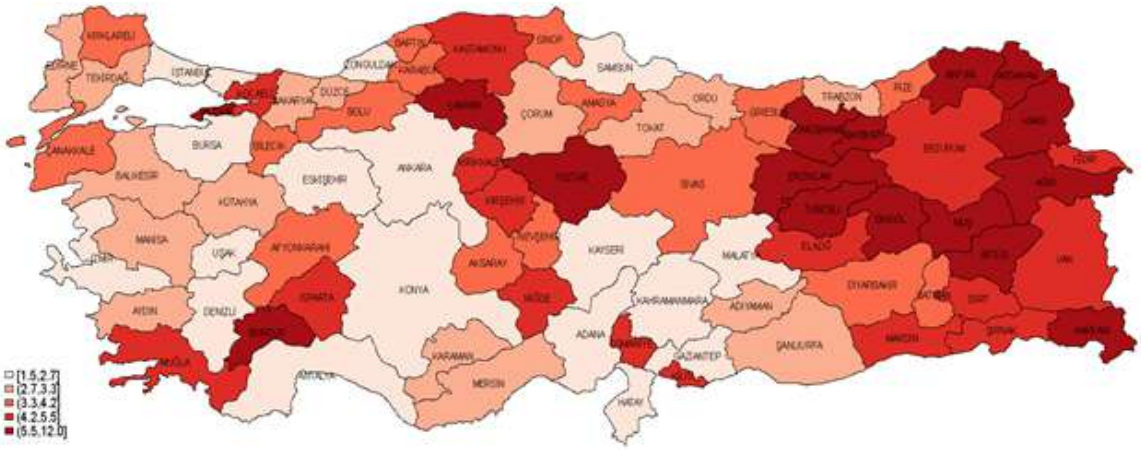
Notes: Authors' calculations from Ministry of Interior and Turkish Statistics data. Figure maps 2017 refugee to population ratios by province.

Figure 2: The Syrian refugee inflow into Turkey (2012-2017)



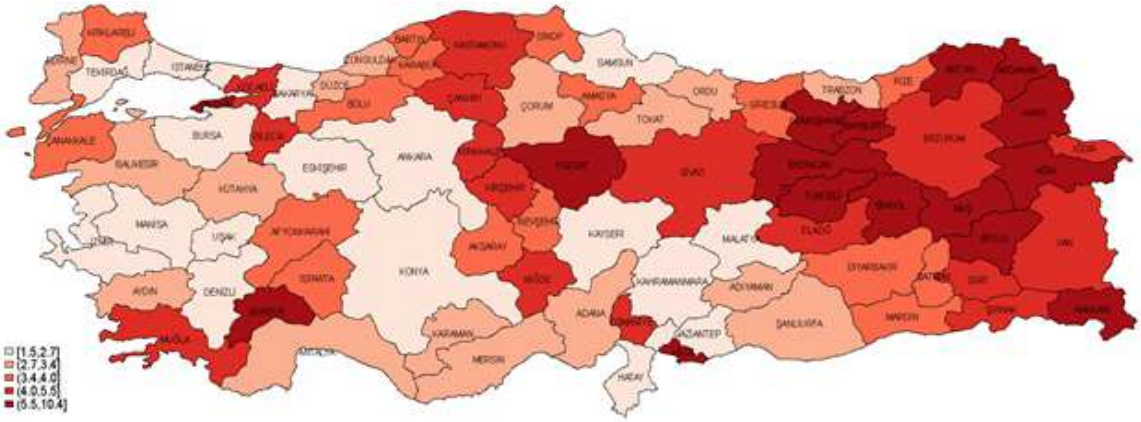
Notes: Authors' calculations from Ministry of Interior and Turkish Statistics data.

Figure 3: Inward job mobility by province (2012-2017 average)



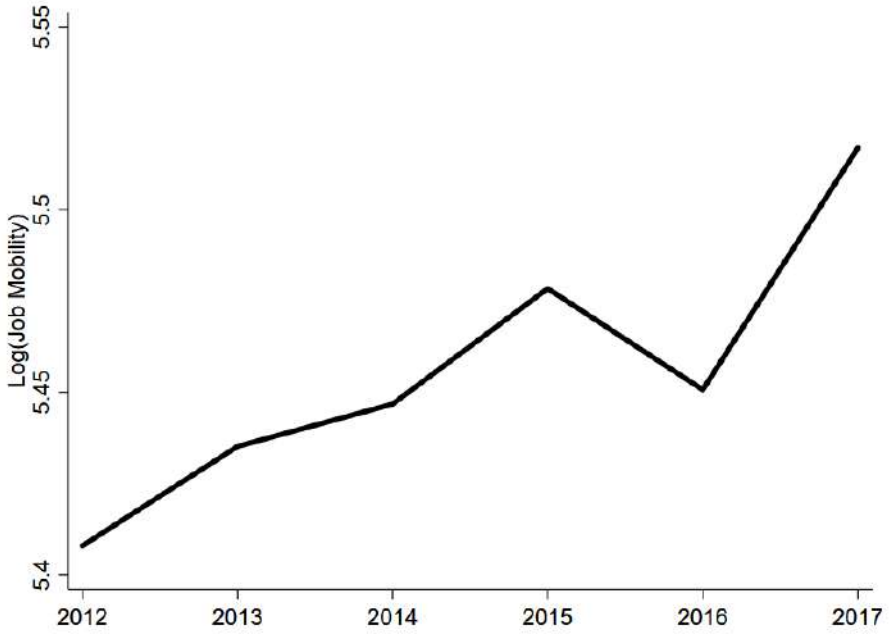
Notes: Authors' calculations from the EIS Social Security Data. Inward job mobility is defined as the ratio of the number of employees moving into the province to the total number of employees in the province (2012-2017 average).

Figure 4: Outward job mobility by province



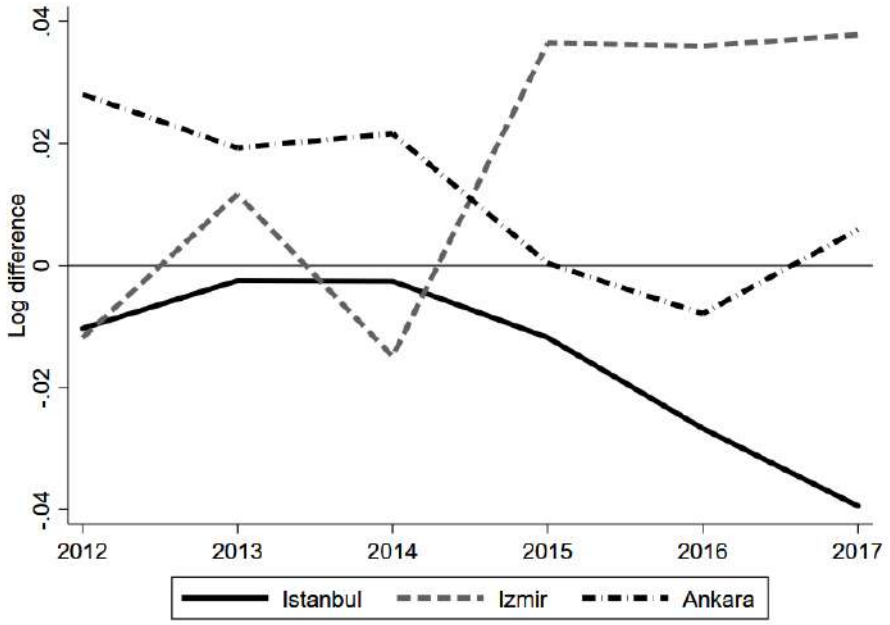
Notes: Authors' calculations from the EIS Social Security Data. Outward job mobility is defined as the ratio of the number of employees moving out of the province to the total number of employees in the province (2012-2017 average).

Figure 5: Total job mobility between provinces



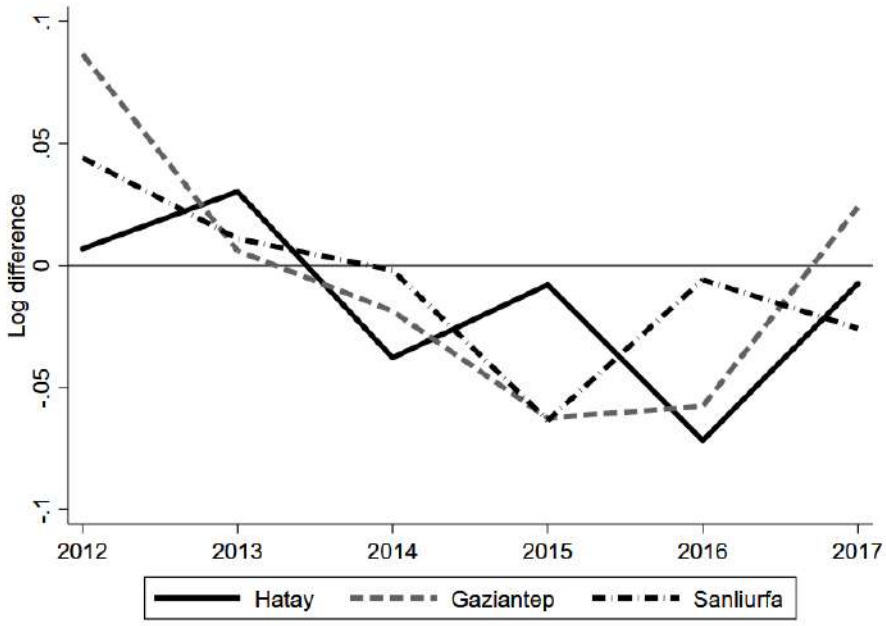
Notes: Authors' calculations from the EIS Social Security Data. Figure plots the log of the quarterly average total number of workers who switch jobs to a different province in each year between 2012 and 2017.

Figure 6: Net job mobility in Istanbul, Izmir and Ankara



Notes: Authors' calculations from the EIS Social Security Data. Figure plots the log difference in the number of new worker arrivals and the number of worker departures in the three largest Turkish cities in each year between 2012 and 2017. Out of the three, only Istanbul hosts a large number of Syrian refugees with nearly 500,000 in 2016.

Figure 7: Net job mobility in Hatay, Gaziantep and Sanliurfa



Notes: Authors' calculations from the EIS Social Security Data. Figure plots the log difference in the number of new worker arrivals and the number of worker departures for the 2012-2017 period in three cities that host the largest number of Syrian refugees in 2016 (excluding Istanbul): Hatay, Gaziantep and Sanliurfa.

Tables

Table 1: Summary Statistics

	mean	sd	p10	p50	p90	N
Refugee to population ratio	0.02	0.083	0	0.001	0.036	38880
Ratio difference	0	0.116	-0.03	0	0.03	38880
The number of p-to-p job mobility	44.2	260.3	1.7	8	75.7	38880
# of p-to-p low wage mobility	27.3	133.6	1	5.7	50.7	38880
# of p-to-p high wage mobility	17	128.6	0	2	25	38880
# of p-to-p young worker mobility	18.7	115.3	0.5	3.3	30.3	38880
# of p-to-p old worker mobility	25.5	145.7	1	5	45	38880
# of p-to-p total migration	400.2	1203.2	23	95.5	823	38878
In-labour mobility/ population	0.0414	0.0194	0.0235	0.037	0.0678	486
Out-labour mobility/population	0.0409	0.0176	0.0234	0.0369	0.0654	486

Notes: p-to-p stands for province to province. There are 81*80 pairs per year and the sample covers the period 2012-2017. The labour mobility numbers are the annual averages of quarterly labour mobility (from $t-1$ to t) whereas the total migration numbers are year totals. The number of p-to-p total migration comes from Address-based Population Registration System (ADNKS). The data source for all other variables is the Entrepreneur Information System (EIS).

Table 2: Impact of Syrian refugees on natives' province-to-province job mobility

	(1)	(2)	(3)	(4)	(5)
Single treatment					
A - OLS					
Ratio (Dest.- Orig. difference)	0.0220	0.0220	-0.2266*	-0.2266*	-0.2266
	(0.1046)	(0.1044)	(0.1370)	(0.1367)	(0.1494)
B - IV					
Ratio (Dest.- Orig. difference)	-0.1080	-0.1080	-1.1880***	-1.1880***	-1.1880***
	(0.1098)	(0.1096)	(0.3219)	(0.3213)	(0.3512)
F-test	159.77	160.43	126.32	126.84	106.14
Separate treatments					
C - OLS					
Ratio (origin)	-0.2774**	-0.2774**	0.2914**	0.2914**	0.2914*
	(0.1339)	(0.1336)	(0.1426)	(0.1423)	(0.1556)
Ratio (destination)	-0.2334***	-0.2334***	-0.1619	-0.1619	-0.1619
	(0.0644)	(0.0643)	(0.2494)	(0.2489)	(0.2721)
D - IV					
Ratio (origin)	-0.5643***	-0.5643***	0.3704	0.3704	0.3704
	(0.1209)	(0.1207)	(0.3982)	(0.3974)	(0.4344)
Ratio (destination)	-0.7803***	-0.7803***	-2.0055***	-2.0055***	-2.0055***
	(0.1285)	(0.1282)	(0.3856)	(0.3848)	(0.4207)
F-test	60.67	60.92	44.66	44.85	37.53
N	38,880	38,880	38,880	38,880	38,880
Origin province FE	Yes		Yes		
Destination province FE	Yes		Yes		
Province pair FE		Yes		Yes	Yes
Origin province trend			Yes	Yes	
Destination province trend			Yes	Yes	
Province pair trend					Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors clustered at the destination-origin pair level. In all models, regressions are weighted by the mean employment size of pairs. All models include year fixed effects. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The F-test rows show the F-test values of the instruments in the first stage of 2SLS estimations.

Table 3: Impact of Syrian refugees on natives' province-to-province job mobility

	(1) All	(2) Low income	(3) High income	(4) Young	(5) Old
Single treatment					
A - OLS					
Ratio (Dest.- Orig. difference)	-0.2266	-0.1373	-0.3931**	-0.2802*	-0.2022
	(0.1494)	(0.1448)	(0.1904)	(0.1476)	(0.1693)
B - IV					
Ratio (Dest.- Orig. difference)	-1.1880***	-1.3347***	-0.7067*	-1.1790***	-1.1059***
	(0.3512)	(0.3617)	(0.3976)	(0.4409)	(0.3184)
F-test	106.14	106.14	106.14	106.14	106.14
Separate treatments					
C - OLS					
Ratio (origin)	0.2914*	0.2170	0.3808**	0.5038***	0.1713
	(0.1556)	(0.1833)	(0.1870)	(0.1894)	(0.1988)
Ratio (destination)	-0.1619	-0.0576	-0.4055	-0.0565	-0.2331
	(0.2721)	(0.2483)	(0.3378)	(0.2495)	(0.2710)
D - IV					
Ratio (origin)	0.3704	0.7249	-0.0819	0.2419	0.4748
	(0.4344)	(0.4634)	(0.5195)	(0.5572)	(0.4268)
Ratio (destination)	-2.0055***	-1.9445***	-1.4952***	-2.1160***	-1.7370***
	(0.4207)	(0.4626)	(0.5009)	(0.4595)	(0.4282)
F-test	37.53	37.53	37.53	37.53	37.53
N	38,880	38,880	38,880	38,880	38,880

*** p<0.01, ** p<0.05, * p<0.1

Notes: : Standard errors clustered at the destination-origin pair level. In all models, regressions are weighted by the mean employment size of pairs. All models include year fixed effects, province pair fixed effects, and province pair specific time trends. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed. The F-test rows show the F-test values of the instruments in the first stage of 2SLS estimations.

Table 4: Impact of Syrian refugees on natives' province-to-province total migration

	(1)	(2)	(3)	(4)	(5)
Single treatment					
A - OLS					
Ratio (Dest.- Orig. difference)	0.0533	0.0546	0.0290	0.0376	0.0387
	(0.0368)	(0.0367)	(0.0738)	(0.0733)	(0.0801)
B - IV					
Ratio (Dest.- Orig. difference)	0.2035***	0.2041***	0.0609	0.0687	0.0697
	(0.0474)	(0.0474)	(0.1483)	(0.1479)	(0.1617)
F-test	451.71	453.55	321.24	322.32	269.69
Separate treatments					
C - OLS					
Ratio (origin)	0.0840	0.0814	-0.0669	-0.0840	-0.0862
	(0.0648)	(0.0644)	(0.1052)	(0.1039)	(0.1135)
Ratio (destination)	0.1904***	0.1905***	-0.0089	-0.0087	-0.0086
	(0.0597)	(0.0596)	(0.1015)	(0.1013)	(0.1108)
D - IV					
Ratio (origin)	0.1143	0.1132	-0.1278	-0.1426	-0.1445
	(0.0743)	(0.0741)	(0.2193)	(0.2183)	(0.2386)
Ratio (destination)	0.5212***	0.5212***	-0.0057	-0.0049	-0.0048
	(0.0858)	(0.0857)	(0.2085)	(0.2081)	(0.2275)
F-test	133.26	133.80	95.83	96.10	80.40
N	38,878	38,878	38,878	38,878	38,878
Origin province FE	Yes		Yes		
Destination province FE	Yes		Yes		
Province pair FE		Yes		Yes	Yes
Origin province trend			Yes	Yes	
Destination province trend			Yes	Yes	
Province pair trend					Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: : Standard errors clustered at the destination-origin pair level. In all models, regressions are weighted by the mean population size of pairs. All models include year fixed effects. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed. The F-test rows show the F-test values of the instruments in the first stage of 2SLS estimations.

Table 5: Impact on total public employment

	(1)	(2)	(3)
A - OLS			
Ratio	0.3917***	0.1142	0.0807
	(0.1461)	(0.1022)	(0.1891)
B - IV			
Ratio	0.5901***	0.2548**	0.3608
	(0.1362)	(0.0967)	(0.4450)
F-test	37.88	18.47	16.60
N	486	486	486
Province FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Nuts-2 region trend		Yes	
Province trend			Yes

*** p<0.01, ** p<0.05, * p<0.1
Notes: : Standard errors clustered at the province level. In all models, regressions are weighted by the mean employment size of the province. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed.

Table 6: Impact on within province job-to-job mobility

	(1) All	(2) Low income	(3) High income	(4) Young	(5) Old
A - OLS					
Ratio	0.4874	0.7034***	0.0290	0.6213	0.3821
	(0.6218)	(0.2436)	(1.6675)	(0.6207)	(0.6512)
B - IV					
Ratio	2.3506**	1.3227	5.0795**	1.3748	2.5340***
	(1.0023)	(1.3403)	(1.9422)	(1.0469)	(0.7892)
F-test	16.80	16.80	16.80	16.80	16.80
N	486	486	486	486	486

*** p<0.01, ** p<0.05, * p<0.1
Notes: : Standard errors clustered at province level. In all models, regressions are weighted by the mean employment size of pairs. All models include year fixed effects, province fixed effects and province level trends. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed.

Table 7: Robustness tests

	(1)	(2)	(3)	(4)	(5)	(6)
	Baseline	Unweighted	Restricted sample	Minimum wage	Long difference	Alternative instrument
Single treatment						
A - OLS						
Ratio (Dest.- Orig. difference)	-0.2266	0.0024	-0.0802	-0.1684	-0.3872**	
	(0.1494)	(0.1294)	(0.1436)	(0.1489)	(0.1930)	
B - IV						
Ratio (Dest.- Orig. difference)	-1.1880***	-0.4540*	-0.9699***	-0.9782***	-1.1079***	-3.1908***
	(0.3512)	(0.2511)	(0.3213)	(0.3467)	(0.3414)	(0.6067)
F-test	106.14	106.14	93.11	105.22	127.97	793.48
Separate treatments						
C - OLS						
Ratio (origin)	0.2914*	-0.0727	0.2449	0.2930*	0.6250***	
	(0.1556)	(0.1832)	(0.2117)	(0.1556)	(0.1864)	
Ratio (destination)	-0.1619	-0.0679	0.0845	-0.0439	-0.1493	
	(0.2721)	(0.1797)	(0.1903)	(0.2825)	(0.3607)	
D - IV						
Ratio (origin)	0.3704	-0.2794	0.3494	0.3537	0.2055	3.7577***
	(0.4344)	(0.3520)	(0.4576)	(0.4370)	(0.3791)	(0.7681)
Ratio (destination)	-2.0055***	-1.1875***	-1.5903***	-1.6027***	-2.0103***	-2.6239***
	(0.4207)	(0.3359)	(0.4218)	(0.4335)	(0.4274)	(9.9418)
F-test	37.53	37.53	33.06	33.50	44.97	244.84
N	38,880	38,880	33,876	38,880	25,920	38,880

*** p<0.01, ** p<0.05, * p<0.1

Notes: : Notes: Standard errors clustered at the destination-origin pair level. All models include year fixed effects and province pair fixed effects. All models except column (6) and (7) include province pair specific time trends. All models except column (2) and (3) report weighted regression results by the mean employment size of pairs . Ratio is the ratio of Syrian refugees to native population. In all estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The first column reports the results of the main model in column 4 of Table 3. The second column uses origin employment size (average of the sample period) as an alternative weight. The third column is an unweighted replication of the main model. Model in column (4) restricts the sample to the pairs with more than 50000 mean employment number. Column (5) adds origin and province level minimum wage employee shares as control variables to account for the the substantial increase in minimum wages in 2016. In column (6), the baseline model is estimated at first differences with overlapping 2-year differences. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed. In column (7), we use the product of the share of the Arab speaking population at the province level in 1965 and the number of Syrians displaced outside of Syria as the instrument.

Table 8: Robustness-quarterly data

	(1)	(2)	(3)	(3)	(4)
Single treatment					
A - OLS					
Ratio (Dest.- Orig. difference)	-0.0629	-0.0629	-0.7839***	-0.7839***	-0.7839***
	(0.0836)	(0.0835)	(0.1212)	(0.1211)	(0.1238)
B - IV					
Ratio (Dest.- Orig. difference)	-0.1363	-0.1363	-1.3520***	-1.3520***	-1.3520***
	(0.0936)	(0.0935)	(0.2167)	(0.2166)	(0.2214)
F-test	157.17	157.34	141.45	141.60	135.59
Separate treatments					
C - OLS					
Ratio (origin)	-0.1357	-0.1357	0.8473***	0.8473***	0.8473***
	(0.1034)	(0.1033)	(0.2023)	(0.2022)	(0.2066)
Ratio (destination)	-0.2615***	-0.2615***	-0.7205***	-0.7205***	-0.7205***
	(0.0658)	(0.0658)	(0.1430)	(0.1429)	(0.1460)
D - IV					
Ratio (origin)	-0.4952***	-0.4952***	0.8976***	0.8976***	0.8976***
	(0.1134)	(0.1133)	(0.3042)	(0.3040)	(0.3107)
Ratio (destination)	-0.7677***	-0.7677***	-1.8063***	-1.8063***	-1.8063***
	(0.1203)	(0.1203)	(0.2897)	(0.2896)	(0.2959)
F-test	59.88	59.94	52.06	52.12	49.90
N	149,040	149,040	149,040	149,040	149,040
Origin province FE	Yes		Yes		
Destination province FE	Yes		Yes		
Province pair FE		Yes		Yes	Yes
Origin province trend			Yes	Yes	
Destination province trend			Yes	Yes	
Province pair trend					Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors clustered at the destination-origin pair level. In all models, regressions are weighted by the mean employment size of pairs. All models include time (year-quarter) fixed effects. Ratio is the ratio of Syrian refugees to native population. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017 and all dependent variables are log transformed.

Appendix A - Results using number of refugees

Table A1: Results using number of refugees and number of job-to-job movers

	All		Exclude Istanbul	
A - OLS				
Syrians (origin)	-0.3915	-0.3915	0.1846	0.1846
	(0.3271)	(0.3576)	(0.1178)	(0.1288)
Syrians (destination)	-0.0330	-0.0330	-0.0026	-0.0026
	(0.3159)	(0.3453)	(0.1028)	(0.1124)
B - IV				
Syrians (origin)	0.3524	0.3524	-0.1594	-0.1594
	(1.0180)	(1.1129)	(0.1506)	(0.1647)
Syrians (destination)	-2.2488	-2.2488	-0.4250***	-0.4250**
	(1.4108)	(1.5422)	(0.1537)	(0.1681)
F-test	62.79	52.54	326.93	273.58
N	38,880	38,880	37,920	37,920
Origin province trend	Yes		Yes	
Destination province trend	Yes		Yes	
Province pair trend		Yes		Yes

*** p<0.01, ** p<0.05, * p<0.1

Notes: Standard errors clustered at the destination-origin pair level. In all models, regressions are weighted by the mean employment size of pairs. All models include time (year) fixed effects. Syrians is the number of Syrian refugees to in a province in 1000s. In all IV estimates, the weighted distance of a province to Syrian regions is used as an instrument for the ratio of Syrian refugees to native population. The sample covers the period between 2012 and 2017. The dependent variables are the number of workers who change jobs from an origin to destination province.

References

Akgündüz YE, Torun H. 2020. Two and a half million syrian refugees, tasks and capital intensity. *Journal of Development Economics* : 102470.

Akgündüz YE, van den Berg M, Hassink W. 2018. The impact of the syrian refugee crisis on firm entry and performance in turkey. *The World Bank Economic Review* **32**: 19–40.

Aksu E, Erzan R, Kırdar MG. 2019. The impact of mass migration of syrians on the turkish labor market. Technical report, CREAM Discussion Paper 15.

Altındağ O, Bakis O, Rozo S. 2020. Blessing or burden? impacts of refugees on businesses and the informal economy. *Journal of Development Economics* : 102490.

Bağır YK. 2018. Impact of the syrian refugee influx on turkish native workers: An ethnic enclave approach. *Central Bank Review* **18**: 129–147.

Balkan B, Tumen S. 2016. Immigration and prices: quasi-experimental evidence from syrian refugees in turkey. *Journal of Population Economics* **29**: 657–686.

Beine M, Coulombe S. 2018. Immigration and internal mobility in canada. *Journal of Population economics* **31**: 69–106.

Borjas GJ. 2003. The labor demand curve is downward sloping: Reexamining the impact of immigration on the labor market. *The quarterly journal of economics* **118**: 1335–1374.

Borjas GJ. 2006. Native internal migration and the labor market impact of immigration. *Journal of Human resources* **41**: 221–258.

Ceritoglu E, Yunculer HBG, Torun H, Tumen S. 2017. The impact of syrian refugees on nativesâĂŹ labor market outcomes in turkey: evidence from a quasi-experimental design. *IZA Journal of Labor Policy* **6**: 5.

Del Carpio XV, Wagner M. 2015. *The impact of Syrians refugees on the Turkish labor market*. The World Bank.

Edo A. 2019. The impact of immigration on the labor market. *Journal of Economic Surveys* **33**: 922–948.

Gezici F, Keskin B. 2005. Interaction between regional inequalities and internal migration in turkey. In *ERSA Conference Papers*. 1–18.

Hatton TJ, Tani M. 2005. Immigration and inter-regional mobility in the uk, 1982–2000. *The Economic Journal* **115**: F342–F358.

Hong G, McLaren J. 2015. Are immigrants a shot in the arm for the local economy? Working Paper 21123, National Bureau of Economic Research.
URL `http://www.nber.org/papers/w21123`

Mocetti S, Porello C. 2010. How does immigration affect native internal mobility? new evidence from italy. *Regional Science and Urban Economics* **40**: 427–439.

Morales JS. 2018. The impact of internal displacement on destination communities: Evidence from the colombian conflict. *Journal of Development Economics* **131**: 132–150.

Mouw T. 2016. The impact of immigration on the labor market outcomes of native workers: Evidence using longitudinal data from the lehd. *US Census Bureau Center for Economic Studies Paper No. CES-WP-16-56* .

Ortega J, Verdugo G. 2016. Moving up or down? immigration and the selection of natives across occupations and locations .

Peri G. 2016. Immigrants, productivity, and labor markets. *Journal of Economic Perspectives* **30**: 3–30.

Tumen S. 2016. The economic impact of syrian refugees on host countries: Quasi-experimental evidence from turkey. *American Economic Review* **106**: 456–60.

Tumen S. 2019. Refugees and 'native flight' from public to private schools. *Economics Letters* **181**: 154–159.