IS IT MERELY A LABOR SUPPLY SHOCK? IMPACTS OF SYRIAN MIGRANTS ON LOCAL ECONOMIES IN TURKEY

DORUK CENGIZ AND HASAN TEKGÜÇ*

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The authors use the occurrence of a large and geographically varying inflow of more than 2.5 million Syrian migrants to Turkey between 2012 and 2015 to study the effect of migration on local economies. They do not find adverse employment or wage effects for native-born Turkish workers overall or for those without a high school degree. These results are robust to a range of strategies to construct reliable control groups. To explain the findings, the authors document the importance of three migration-induced demand channels: the complementarity between native and migrant labor, housing demand, and increased entrepreneurial activities.

As of 2019, more than six million Syrians have left their country since the Syrian Civil War began in 2011. Such a large displacement of people has affected many countries around the world. As a result, the immigration of refugees has taken center stage in political debates. The traditional economic model tends to paint a relatively pessimistic picture for natives who are affected by immigration. It predicts a wage, and possibly employment, decline (Borjas 2013; Dustmann, Schönberg, and Stuhler 2016). And yet, migrant labor may complement native labor and increase native worker productivity (Ottaviano and Peri 2012). In addition, along with their labor power, migrants bring their purchasing power and increase the demand for

*DORUK CENGIZ is a Data Scientist at OMP. HASAN TEKGÜÇ (https://orcid.org/0000-0002-3902-4486) is an Associate Professor of Economics at Kadir Has University.

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products and services in the host regions (Constant 2014; Peri 2014). Depending on the relative intensities of the labor supply and labor demand boosts, the potential adverse effects might not materialize even in the short run. Therefore, the overall effect on the native workforce is theoretically ambiguous, and the empirical evidence on the labor market impacts is mixed (Card 2009; Peri 2012, 2014, 2016; Borjas and Monras 2017; Clemens and Hunt 2019).

We add to this literature by empirically examining the labor demand and the labor supply effects of the unusually large, sudden, and geographically concentrated migration flow of more than 2.5 million Syrians into Turkey between 2012 and 2015. For this purpose, we propose the use of novel and credible factor-based models that are appropriate for examining the effects on both demand and supply. Such models account for the violation of the parallel trends assumption without resorting to contemporaneous controls. This method allows us 1) to causally document the total (as opposed to partial) wage and employment effects of the Syrian migration to Turkey and 2) to assess the presence of migration-induced demand channels.

The overwhelming majority of Syrian migrants to Turkey do not have a high school degree, and they are not Turkophones. Thus, if the migration shock affects only labor supply, the natives with less than high school education (LTHS) in the host regions would be most adversely affected. Using the TURKSTAT Household Labor Force Survey from 2004 to 2015, we initially document how employment levels and wages of Turkish workers of different skill levels change as a result of the Syrian migration.

Then, we turn to the migration-induced demand channels to further investigate the effects of the migration. The demand channels might enable local economies to fully or partly absorb the labor supply shock. We examine three channels: 1) the native–migrant complementarity, 2) housing demand, and 3) increased entrepreneurial activities of Syrians and non-Syrians in the host regions. To individually assess the existence of such channels, we show changes in the affected natives' job characteristics, in the number of residential building permits, and in the new business creation by Syrians and non-Syrians. Thus, our article is the first to explore multiple demand channels and the labor market outcomes by providing a comprehensive picture of the effects of the Syrian migration on Turkish workers and local economies in Turkey.

One main empirical challenge in estimating effects of migration is that migrants may prefer to go to regions that are experiencing an economic boom, so pre-existing economic trends and regional business cycles might bias the estimates. For instance, the wages and employment of native workers may have already been increasing rapidly in the host regions, so a basic difference-in-differences model would attribute the rise in wages to the migration. The current setting is unlikely to suffer from this type of endogeneity. The Syrian forced migrants in Turkey are primarily seeking basic safety, so they are residing primarily in the southern regions bordering

Syria. These border regions within Turkey have relatively poor pre-existing employment prospects for natives. In addition, the migration occurred a short time after the 2008–2009 Great Recession. As a result, if the pre-existing economic conditions and differential post-recession recovery rates are not accounted for, empirical estimates of the Syrian migrants' effects on the local labor markets might be inaccurate. This concern is relevant for two-stage least squares estimators as well since the predicted variable of interest (predicted migrants to population ratio) might be correlated with the aforementioned confounders. Moreover, the massive influx of Syrian arrivals to the border regions relative to the native population means that many, if not all, regional economic outcomes in the host regions are affected. Hence, using contemporaneous economic outcomes as regional business cycle controls would essentially mean assuming away one of the migration-induced channels. To address the potential endogeneity without assuming away any of the demand or supply channels, we employ the generalized synthetic control (GSC) method proposed by Xu (2017) in addition to more traditional ordinary least squares (OLS) and two-stage least squares (2SLS) estimators that are augmented to account for the potential confounders. The GSC shows and purges confounding factors that jeopardize the identifying parallel trends assumption in event study designs. Therefore, our use of the GSC, in addition to the traditional model specifications, provides causally interpretable results.

Background

Open Door but Particularities

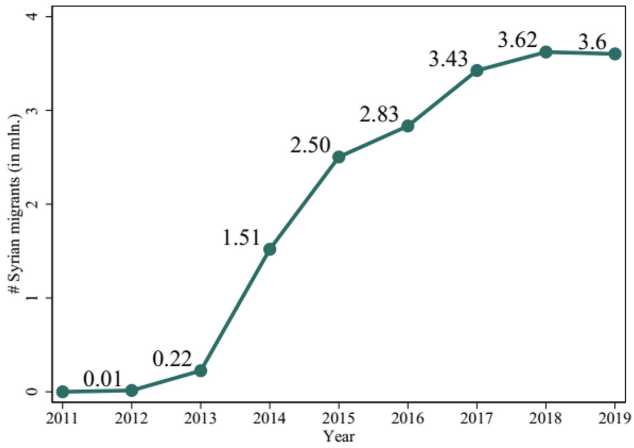
The Syrians fleeing from the war initially migrated to three bordering countries: Lebanon, Jordan, and Turkey.[1] Turkey, the northern neighbor of Syria, has followed a relatively open-door policy. This policy resulted in more than 2.5 million Syrians entering Turkey within a short time, between 2012 and 2015 (Figure 1). Although this number corresponds to 3% of the overall Turkish population, the residential distribution of the migrants is highly non-uniform. The majority of the Syrian migrants reside in the border regions, because of the geographical proximity to Syria (see Online Appendix B, Figure B.1). The government-built temporary accommodation camps are also close to the border, though they provide accommodation to only a small share of the migrants, suggesting that the actual number of Syrian migrants is considerably larger than the anticipated one.[2]

Legally, Syrians fleeing from the civil war are considered "guests," not refugees (Özden 2013), which prevents them from seeking asylum in

[1]For a detailed investigation of Syrian migrants' labor market effects in Jordan, see Fallah, Krafft, and Wahba (2019).

[2]It was not until 2014 that the Turkish government started distributing identity cards. The cards enabled the migrants to have access to certain services including aid, health care, and education outside the camps. The cards also improved the quality of the data about the migrants.

Figure 1. Total Number of Syrian Forced Migrants in Turkey



Notes: Total number (in millions) of Syrian forced migrants in Turkey between 2011 and 2019. Only Syrian nationals who fled their country because of the war are considered. Data are provided by Ministry of Interior Directory General of Migration Management.

another country yet does not bring automatic access to the formal labor market. As a result, only a negligible share of migrants have work permits. However, they can and do work informally. By January 2016, only 7,351 of the migrants had work permits; yet approximately 400,000 Syrian nationals were informally employed by the end of 2015 (Üstün 2016).

Syrian Forced Migrants in Turkey

Although Syrian migrants speak the same language as the native populations in Jordan and Lebanon, the overwhelming majority of the migrants are non-Turkophones, and more than 90% do not have a high school degree. Table 1 presents a descriptive summary of the demographic characteristics of the (15 years and older) Syrian migrants in Turkey. We also present comparable statistics for all the (age 15–64) natives, and for the (age 15–64) natives who reside in the regions where the ratio of the migrant population to the natives is greater than 10%. We exclude natives older than 65 because they are mostly retired and not in the labor force. The table shows that the migrants have less education than both native samples. Whereas 92.4% of migrants have no high school degree, this number is 66.1% for all natives, and 76.6% for the latter sample. The migrants are also younger and less likely to be women than are the natives.

Because of migration, the working-age population of the border regions with less than high school (LTHS) education increased by approximately 15% between 2011 and 2015. As a result of this, one expects any adverse effects of the migration on the native workforce to be most apparent among the lower-skilled LTHS workers in the border regions.

Table 1. Characteristics of the Syrian Migrants and Natives

	Syrian migrant (Age 15+) (1)	*Native (Age 15–64)* (2)	*Native (Age 15–64)* (3)
Educational attainment			
No degree	0.623	0.116	0.234
Primary school	0.215	0.321	0.280
Secondary school	0.086	0.224	0.252
High school	0.047	0.191	0.143
Some college and above	0.027	0.148	0.092
Age groups			
15–18	0.182	0.123	0.176
19–24	0.189	0.106	0.127
25–29	0.154	0.119	0.120
30–34	0.129	0.124	0.116
35–39	0.095	0.117	0.104
40–44	0.069	0.107	0.099
45–49	0.055	0.089	0.078
50–54	0.044	0.088	0.075
55–59	0.030	0.070	0.056
60–64	0.021	0.058	0.050
65+	0.032	—	—
Gender			
Man	0.531	0.501	0.490
Woman	0.469	0.499	0.510
Regions	All	All	Syr./Nat. >10%

Source: Data on Syrian migrants is from the Ministry of Interior Directory General of Migration Management.

Notes: The first column reports the demographic characteristics of the (15 years and older) Syrian migrants in 2015. Columns (2) and (3) provide comparable numbers for all (15–64) natives, and for the (15–64) natives in the regions where the ratio of Syrian migrant population to natives (Syr./Nat.) is at least 10% calculated from the 2015 TURKSTAT Household Labor Force Survey.

Literature Review on the Syrian Forced Migration in Turkey

Effects on Natives' Employment and Wages

Currently, the debate on the impact of the Syrian migration to Turkey mostly revolves around its effects on employment. The findings from empirical studies on the subject are mixed. Seven of the studies that are closely related to ours are Akgündüz, van den Berg, and Hassink (2015), Del Carpio and Wagner (2015), Ceritoglu, Yunculer, Torun, and Tumen (2017), Aksu, Erzan, and Kırdar (2018), Bağır (2018), Akgündüz and Torun (2020), and Altındağ, Bakis, and Rozo (2020). While the first and the fourth studies argue that no net significant employment effect occurs on native workers, others claim a significant decline in employment for native workers who are at the same skill level as the Syrian migrants. Similarly, there is no agreement for the direction of the wage effect. Ceritoglu et al. (2017) and Altındağ et al. (2020) found no effect, whereas Bağır (2018) found a negative effect on the native LTHS wages.

Effects on Local Economies

Öztürkler and Göksel (2015) and Bahçekapılı and Çetin (2015) reported improvements in regional trade balances in the treated provinces. The former study also suggested the migration has caused local inflation to rise and home sales to increase. Akgündüz, van den Berg, and Hassink (2018) investigated total firm entry in the treated provinces. They found that the total firm entry does not seem to be significantly affected; however, they found a substantial increase in the number of new foreign-owned firms.

We improve upon all these studies in three respects: First, we consider wage and employment effects of the migration arising from its labor demand as well as labor supply effects. Our empirical models do not include proxy controls, such as trade volume, that would assume away certain migration-induced labor demand channels. This approach contrasts with six of the aforementioned studies that use contemporaneous economic outcomes as controls.[3] Thus, we provide a more comprehensive picture of the impact of the Syrian forced migration. Specifically, the estimated effects are the total effects of the migration, not the partial effects. Second, we employ the GSC method in addition to the traditional difference-in-differences and 2SLS estimators. This combination allows us to 1) eliminate potential confounders using a data-driven procedure and 2) transparently present the dynamic nature of the effects. In the former regard, the GSC accounts for differential regional post-recession recovery rates, economic trends, and business cycles. As discussed below and in Online Appendix E, these confounders play an important role in explaining the discrepancies in the literature. Accounting for the confounders might also be necessary for the studies that rely on 2SLS estimators since the predicted variables of interest might be correlated with them.[4] In the latter regard, showing the entire time path of the estimated effect reveals that our point estimates are qualitatively unaffected by alternative pre-treatment comparison years. Third, we correct standard errors for serial correlation and a small number of clusters. Except for Akgündüz et al. (2015) and Akgündüz et al. (2018), none of the studies consistently account for serial correlation. They use heteroskedasticity robust or region-by-time clustered standard errors for testing purposes, which leads to over-rejection of the null hypothesis (Bertrand, Duflo, and Mullainathan 2004).

Conceptual Framework

Migration waves result in labor supply and labor demand shifts. These effects pull the native workers' employment and wages in opposite

[3]The six articles are Akgündüz et al. (2015), Akgündüz et al. (2018), Ceritoglu et al. (2017), Bağır (2018), Aksu et al. (2018), and Öztürkler and Göksel (2015).

[4]As Goldsmith-Pinkham, Sorkin, and Swift (2019) suggested, the empirical strategies that use 2SLS estimators in migration-related studies with pre-treatment periods are difference-in-differences models with exposure research design. They advocated that the researchers should test for the pre-existing trends. In the current case, the degree of exposure is usually determined by pre-treatment Arabic-speaking share (e.g., Altındağ et al. 2020) or distance (e.g., Del Carpio and Wagner 2015).

directions. The Syrian migration to Turkey increases the labor supply of lower skilled workers, which might lead Turkish and Syrian workers to compete for jobs. According to the descriptive demand-supply framework, this would indicate a rightward labor supply shift, which pulls the equilibrium wage downward. It is likely that part of the wage decline will be absorbed by a decline in natives' employment. Thus, the labor supply effect of the migration is a decrease in similarly skilled Turkish workers' wages and, potentially, employment.

By contrast, migration-induced demand channels cause a rightward shift in the labor demand and tend to partly or wholly counteract the labor supply shock. We assess the presence of three of these channels in Turkey. The first channel is the native–migrant complementarity (Peri and Sparber 2009; Ottaviano and Peri 2012). If natives and migrants in the same skill level possess different abilities and can perform different tasks, the competition for jobs might be considerably less severe, and cooperation may even take place.

To examine this channel, the share of formally employed LTHS workers is particularly relevant in our case because of the legal status of the migrants. They cannot work formally, and informal employment in Turkey is highly common in low-skilled, manual, task-intensive jobs, such as in agriculture and construction (Tansel and Acar 2017). Thus, a rise in the formal employment among the native LTHS workers would suggest existence of this channel.

The second channel is the housing demand channel (Howard 2020). This channel is also highly relevant for the current case, as the temporary accommodation camps in Turkey provide shelter to less than 10% of the migrants. Hence, most of the migrants meet their accommodation needs with their own means. In other words, the housing demand would likely rise with the migration. This, in turn, would lead to a boom in the residential construction industry.

The third channel is the business creation channel (Kerr and Kerr 2011). With the Syrian migrant workers come the regional demand boost and Syrian entrepreneurs. The demand boost might attract entrepreneurs from all nationalities to start new businesses. In addition, Syrian entrepreneurs have fewer opportunities because of the war in the origin country, thus they are more likely to invest in the destination country.

These channels increase the demand for native workers. For the native LTHS workers, the main effect of the migration-induced demand boost would be to counteract the labor supply shock. For the native high school graduate or above (HSG) workers, wages and/or employment might increase compared to the counterfactual case without a migration shock because of both the migration-induced demand channels and the higher likelihood of having tasks complementary to LTHS and/or migrant workers. Therefore, ignoring the demand channels can result in incomplete

theoretical models that overpredict the potential adverse effects of the migration on the native workforce.

Data

Syrian Migrants

We obtain the data on the number of Syrian guests in Turkey from the Ministry of Interior Directory General of Migration Management (MoI) database (see Appendix A at the end of this article for details). The available data on the total number of the Syrian migrants in Turkey starts from 2011, the first year of the Syrian Civil War. Since 2015, MoI has reported the number of the Syrian migrants at province level; and their age and educational distribution at national level.[5]

Native Labor Force and Labor Market Outcomes

We obtain the data on the labor market outcomes of native workers from the Household Labor Force Survey (HLFS) published by TURKSTAT, the official statistical institute of Turkey. We use the data from 2004 to 2015, which include 3,921,420 individuals aged 15 to 64. Because of the political turmoil in Turkey in 2016 and onward, we do not include those years. The annual data report employment status, monthly wage, demographic characteristics of individuals, social security coverage, and residency at Nomenclature of Territorial Units for Statistics 2 (NUTS-2) level. The demographic characteristics include 10 age groups ((15–19), (20–24), . . . (60–64)), three education levels (less than middle school, less than high school, high school graduate and above), and two genders (male and female). The social security variable, along with the employment status variable, allow us to determine whether an individual is formally or informally employed; as, according to the Turkish Law, every formally employed individual must have social security coverage. Thus, we know with certainty that a worker with no social security coverage is informally employed.

Following the literature (e.g., Card and Peri 2016), we aggregate the individual-level annual data at NUTS-2-by-year level, obtain employment counts, then normalize them by regional pre-treatment (2011) population. The primary motivation behind this procedure is to be able to construct a dependent variable that is not affected by local population changes due to the migration.[6]

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[5]In 2014, the Ministry of Interior made a public statement on the number of Syrian guests in each province. Although the relative Syrian densities in the statement are highly similar to the 2015 data, the figures are too round to be exact. In addition, the data are not very reliable prior to the date when the government started to distribute the identity cards to the Syrian forced migrants.

[6]We note that using an individual-level employment indicator as the outcome variable is equivalent to using employment/population. Therefore, estimates from regressions with individual-level data might be affected by changes in population from internal migration of natives as well as employment.

Similarly, following the literature (e.g., Borjas 2017) in examining the wage effects of the migration, we partial out the demographic effects and use the residuals. More concretely, we time-demean the log-transformed monthly wage variable at individual-level for each age-by-education-by-gender group. Then, we average the data at NUTS-2-by-year level. We also examine demographic groups separately in our regressions, thereby implicitly controlling for demographic factors.

Housing Demand

To examine the housing demand effects, we use the administrative 2004–2015 province-level new residential building permits data, which are published by Turkish Statistical Institute (TURKSTAT). Since it is administrative, it does not include squatter housing, which is common among low-income households. Thus, our estimates may constitute a lower-bound since an increase in squatter housing demand is not directly visible to us.

Firm Formation

We use the administrative province-level data on new firm establishments published by the Union of Chambers and Commodity Exchanges of Turkey (TOBB). Since 2010, TOBB has collected and reported province-level information on new company establishments and their start-up capital on behalf of TURKSTAT. The data on new company establishments start from 2009, and the data on start-up capital investment from 2010. We also acquire information on the total amount of new Syrian cofounded firms and the capital invested in Turkey from the same source.

Table 2 summarizes the data on the native employment and wages, residential permits, and new firm establishments. In the table, we divide the sample into six subsamples, according to the ratio of Syrian migrant population to natives in 2015 (less than 2%, between 2% and 10%, and more than 10%) and the time frame (2004–2011 and 2012–2015). Presenting the summary statistics in this way displays the changes as well as the levels of the outcomes of interest by the treatment intensity. Thus, one could carry out a simple difference-in-differences analysis using the numbers reported.

Table 2 shows that in terms of the overall native population, the regions with high and low Syrian density are similar. Employment rate, however, is remarkably lower in the high Syrian density regions than in other regions before 2012. Decomposing it into formal and informal employment rates reveals that the discrepancy is primarily attributable to the share of formally employed workers. The share of individuals who are formally employed is considerably lower in the high Syrian density regions. More than two-thirds of workers in these regions are informally employed, whereas this number is below 50% in other columns. This finding partly explains the pre-2012 average wage differences across regions. The employment rates and wages

Table 2. Descriptive Statistics

	Pre-2012 Averages			*2012–2015 Averages*		
Variables	*Syr./Nat. > 10%*	*10% ≥ Syr./Nat. ≥ 2%*	*2% > Syr./Nat.*	*Syr./Nat. > 10%*	*10% ≥ Syr./Nat. ≥ 2%*	*2% > Syr./Nat.*
Labor force statistics						
Working-age population	1,559,380	2,833,012	1,323,757	1,832,563	3,135,181	1,444,050
Employment rate	0.366	0.435	0.488	0.393	0.487	0.528
Formal employment rate	0.138	0.280	0.253	0.198	0.357	0.321
Informal employment rate	0.228	0.155	0.235	0.195	0.130	0.207
Employment rate of LTHS	0.335	0.379	0.448	0.354	0.418	0.479
Average wage (in 2010 TL)	793.182	1,013.708	992.321	944.653	1,146.054	1,125.238
Average wage in informal employment (in 2010 TL)	486.547	632.988	541.072	558.988	630.005	593.086
Average wage of LTHS (in 2010 TL)	596.169	744.461	711.090	684.889	797.797	778.216
Building statistics						
Resid. building permits (m^2)	816,598	2,639,413	768,649	2,219,706	4,086,398	1,127,139
Resid. building permits (# dwelling units)	4,798	17,219	5,043	12,872	26,465	7,086
Resid. building permits (# buildings)	689	2,509	841	1,148	2,999	910
Resid. occupancy permits (# dwelling units)	2,383	8,414	3,635	7,005	20,114	6,051
New firm statistics						
# New firm establishments	470.600	1,988.667	303.699	563.250	2,246.107	303.544
Start-up capital investment (in 2010 million TL)	173.547	667.043	79.246	133.015	435.109	53.020

Sources: Labor statistics are from the Turkish Statistical Institute (TURKSTAT) Household Labor Force Survey, building statistics from the TURKSTAT, and new firm statistics from The Union of Chambers and Commodity Exchanges of Turkey (TOBB).

Notes: The table reports the mean values for the outcomes. The sample is divided into six, according to the relative size of Syrians/Natives (Syr./Nat.) and the time dimensions. Pre-2012 corresponds to 2004–2011, 2009–2011, and 2010–2011 for labor and building statistics, the number of new firm establishments, and the total start-up capital investment, respectively. LTHS, less than high school; TL, Turkish Lira.

have considerably increased, and the informal employment rate has declined after 2012 in all regional groups.

The new building and new firm statistics reveal that the size of the economic activity is similar in high and low Syrian density regions, and remarkably larger in the medium density regions. The latter finding is due primarily to Istanbul and Izmir, two provinces whose combined gross provincial products amount to more than 35% of Turkey's GDP. Comparing pre-2012 years with 2012 to 2015, we observe considerable changes in the residential building statistics for all the regional groups. In addition, the table shows that the percentage increase in the number of new building permits appears to be positively correlated with the Syrian density. The new firm statistics also show a similar pattern, in which the changes for the high and medium Syrian density regions are always larger than the low Syrian density regions.

Econometric Framework

One of the challenges in establishing a causal relationship between an outcome of interest and the migration is that certain regions might be able to better absorb the labor supply shocks because of factors unrelated to the migration, such as underlying regional economic trends or business cycles. If this is known by the migrants, they are likely to move to these regions. Although this may not be likely in the current case, since the migration reason is the war in the origin country, there is no guarantee that the economic trends of destination regions are similar to the rest of the country. Thus, a naïve empirical model that does not account for these factors might confound the latter with the effects of the migration. To address this issue, we employ factor-based approaches.

In the presence of unobserved time-varying confounders, such as regional trends, the identifying assumption of difference-in-differences estimators, namely the parallel trends assumption, might be violated. The factor-based models, arguably, overcome this problem by purging the patterns in the error term that can be formulated as interactions of region-specific intercepts (factor loadings (λ_i)) and time-varying coefficients (latent factors (f_t)).

More specifically, the models we estimate are as follows:

$$Y_{i,t} = \delta\ T_{i,t} + \lambda_i \boldsymbol{f_t} + \mu_i + \kappa_t + \varepsilon_{i,t}\ , \tag{1}$$

where i indicates region or province, t year, and $Y_{i,t}$ the outcome variable. $T_{i,t}$ is the variable of interest. μ_i and κ_t are region and year fixed effects, respectively. The coefficient of interest is δ, which reports the effect of the migration. We also show the dynamic effects, and in those cases, δ is a vector that can be written as δ_t. $\boldsymbol{f_t}$ are time-variant factors and λ_i are region-specific factor loadings. The latter two terms are the variables that turn the standard fixed effects models into factor-based approaches.

Ordinary Least-Squares and Two-Stage Least-Squares Estimators (OLS and 2SLS)

As proposed by Zipperer (2016), one method to construct the factors and their loadings is to use pre-treatment, regional, industry-specific employment shares as the factor loadings and interacting them with year fixed effects. This method allows each industry to follow a different trend of any functional form, while the intensity of the industry-specific trend in affecting the outcome variable is determined by the pre-treatment employment share of the industry.[7] Thus, these variables account for underlying pre-existing industry trends, and purge the effect of the underlying industry trends while estimating δ.

Following this idea, we create 2004–2005 NUTS-2 level employment shares of nine single-digit NACE-1 industries in Turkey and interact them with the year fixed effects. (Using other years has minimal effect on the results.) Thus, we allow each industry to follow a different trend, and these trends are important to each region according to the pre-treatment employment shares. Because the loadings belong to the pre-treatment periods, they cannot be affected by the migration wave. They are not bad controls, because they do not eliminate one of the channels in which the migration might affect the regional economy.

In addition to the OLS, we employ 2SLS estimators when we use two instruments. The first instrument is a border indicator. The second one is the predicted Syrian migrant distribution according to the regional Arabic-speaking population in the 1965 Census.[8] As we show below, the proximity to Syria and the established networks by older generations are important factors for migrants when choosing their residences (instrument relevance). In addition, both variables are independent of current regional economic trends (instrument exogeneity).

In these specifications, as the variable of interest $T_{i,t}$, we use a continuous variable. The variable takes on the value of 0 for all periods before 2012, since very few Syrian forced migrants were present before 2012. For 2012 and onward, this variable is the share of Syrian migrants in region i in 2015 according to the MoI statistics. Thus, $T_{i,t}$ takes only 2 distinct values for each region; 0 during 2004–2011, and a positive value corresponding to 2015 Syrian migrant to native ratio in 2012 onward. This variable is similar to the one used by Fallah et al. (2019), and it takes into account regional variation in the migrant density. However, it does not consider the changes within the post-treatment period. Our primary reason for constructing the variable of interest in this manner is the high measurement error in the

[7]Put concretely, if an industry is non-existent in a region, then $\lambda_i = 0$ for the region. Thus, the region will not be affected by the trend of the industry. Similarly, a high λ_i means that the trend of the industry has a larger impact on the outcome for the region.

[8]This is calculated as $(\textit{Predicted Syrian migrant})_i = \frac{(\textit{Arabic Speaking in } 1965)_i}{\sum_i (\textit{Arabic Spearking in } 1965)_i} \; x \; (\textit{Syrian forced migrants})_t$. The Census included a mother tongue question until 1965.

regional distribution of the Syrian forced migrants in the official statistics prior to 2015. One possible concern here is that the change in the post-treatment periods might contain important information. We address this concern in Online Appendix D as follows: We adjust the variable of interest according to the total number of Syrian migrants in Turkey. In other words, we multiply $T_{i,t}$ by the ratio of the number of Syrian migrants in Turkey in t to that number in 2015. This method incorporates the changes in the post-treatment periods. We call this new variable "adjusted continuous variable of interest."

Generalized Synthetic Control (GSC) Method

The method proposed by Zipperer (2016) employs pre-determined employment shares as factor loadings. An alternative to this is the generalized synthetic control method that allows the data to determine both the factors and the loadings. In other words, it uses the data to find any patterns in the error term. Thus, this method can capture and purge other confounders as well as industry-related trends, thereby presenting more credible estimates. It is our preferred method.

Briefly, the GSC builds upon the interactive fixed effects model of Bai (2009) and combines it with the cross-validation procedure. First, employing the interactive fixed effects model, the factors (f_t) and factor loadings (λ_i) of the control groups are calculated by estimating the model only for the control groups. While this step allows us to obtain the factors, the loadings for the treated units are missing. They are estimated in the second step in which we use the estimated factors and only the pre-treatment periods of the treated units. There, we run a regression to estimate the region- or province-specific factor loadings. Finally, to determine the exact number of factors to be purged, we employ a leave-one-out cross-validation procedure that goes through all the pre-treatment periods of treated groups, and then compares the prediction performances (mean-squared prediction errors) of the models with an alternative number of factors.

As we noted earlier, the GSC is a factor-based model and it builds on the interactive fixed effects model, not the synthetic control model of Abadie, Diamond, and Hainmueller (2010). Because of the method it employs in obtaining factors and loadings, unlike the OLS and 2SLS models, it requires a strict categorization of treatment and control regions. Thus, in this specification, we use a binary variable of interest that takes on the value of 1 for 2012–2015 in the regions where the Syrian migrant density is high (treated regions in the post-treatment periods); and 0 otherwise (control regions, and all pre-treatment periods). We refer to regions or provinces where the migrant density was more than 10% in 2015 as the treated regions. For creating sharp differences in terms of the migrant density between control and treatment regions, we exclude 7 NUTS-2 regions or 14 provinces where the Syrian migrant share is between 2% and 10% in our main analyses. To

make the coefficients comparable, we multiply the estimates obtained by the traditional methods (OLS and 2SLS) by the ratio of the average Syrian migrant share in the high density regions to that in the control regions. Thus, we report: $\delta = \omega_1 * (Syr_{tr} - Syr_{co})$, where ω_1 is the OLS or 2SLS estimate, and Syr_{tr} and Syr_{co} show the ratios of the Syrian migrants to the native population in the treated and control regions.

Robustness Checks

We make certain choices in our model specifications. To show that these choices do not affect the findings in a qualitative way, we alter them and report the results in Online Appendix D. These robustness checks include using alternative migrant density thresholds (GSC), the border instrument only (2SLS), no unobserved factors (2SLS), state-specific linear trends instead of the industry factors (2SLS), the quadratic term of the variable of interest to capture the nonlinear effect (2SLS), and the adjusted continuous variable of interest (2SLS).

Inference

Turkey has 81 provinces and 26 NUTS-2 regions. Therefore, when the variable of interest, $T_{i,t}$ is defined at the NUTS-2 level in wage and employment regressions, the number of clusters is too low, as noted by Angrist and Pischke (2008). This renders the confidence interval estimates too narrow. To account for this, we produce p values that are better suited for testing purposes in these cases. We use the parametric bootstrap method proposed by Xu (2017) in the GSC model, wild cluster bootstrap method (CGM) proposed by Cameron, Gelbach, and Miller (2008) in the OLS model, and wild restricted residual bootstrap (WRR) proposed by Davidson and MacKinnon (2010) in the 2SLS model.

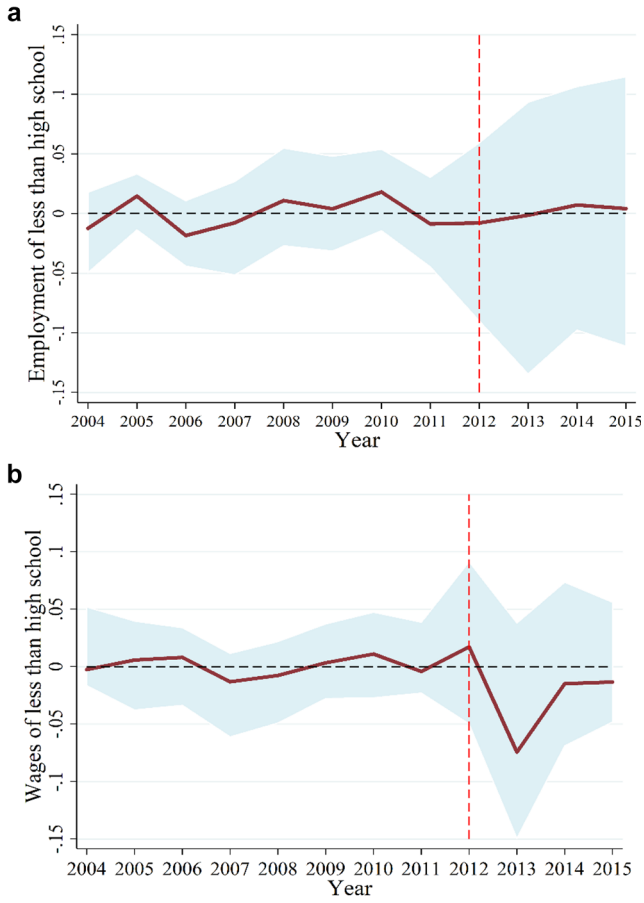
Findings

Impact on the Native Workforce

Given the educational characteristics of the Syrian migrants and the ongoing debate in the literature, we begin our examination with how the migration affected lower-skilled (less than high school (LTHS)) native workers' employment and wages. Figure 2 (constructed with the GSC method), panel (a) shows that lower-skilled employment has not declined because of the migration. On average, the estimated effect in the post-treatment period is 0.000 (0.047).[9] Their wages (panel (b)), however, appear to decline in 2013 and quickly recover in 2014. On average, native LTHS wages have declined by 2.1% (standard error 2.5%), though the negative estimate is

[9]In Online Appendix B, Table B.3, we examine demographic groups at more disaggregated levels (teen, male LTHS, female LTHS, less than middle school); the effects remain essentially the same.

Figure 2. Impact of the Syrian Migration on Native LTHS Employment Rates and Wages over Time



Notes: Panel (a) plots the change in the native less than high school (LTHS) employment rate in the treated regions compared to the counterfactual. Panel (b) plots the percentage change of the average (residual) wages of the native LTHS workers in the treated regions compared to the counterfactual. Both panels use the 2004–2015 NUTS-2-by-year aggregated TURKSTAT Household Labor Force Survey. Vertical dash lines indicate the first year of the migration shock. The generalized synthetic control method (GSC) is employed. Shaded areas show 95% confidence intervals, calculated using the parametric bootstrap of the GSC.

mostly driven by the decline in 2013, hence not precise enough to reject the null hypothesis of no effect.

In Table 3, we report the estimated employment (panel A) and wage effects (panel B) on the native lower- (LTHS) and higher-skilled (HSG) workforce using the GSC, OLS, and 2SLS methods. Column (1) reproduces the estimates of Figure 2. It also shows that 1 and 3 unobserved factors are purged in panels A and B, suggesting a naïve difference-in-differences estimator might fail to produce credible estimates. In column (2), we show the effects on the higher-skilled. Both employment and wage effects appear to

Table 3. Employment and Wage Effects of the Syrian Migration by Skill Groups

	Generalized synthetic control (GSC)		*2SLS*		*OLS*	
Groups:	*(1) LTHS*	*(2) HSG*	*(3) LTHS*	*(4) HSG*	*(5) LTHS*	*(6) HSG*
Panel A: Employment						
Change in employment rate	0.000	0.063	−0.000	0.060	−0.002	0.053
	(0.047)	(0.047)	(0.036)	(0.057)	(0.029)	(0.054)
P value	0.991	0.286	0.984	0.292	0.940	0.510
Unobserved factors	1	0	1	1	1	1
Panel B: Wage						
% change in wages	−0.021	0.057	0.051	0.049	0.072	0.055
	(0.025)	(0.023)	(0.033)	(0.026)	(0.030)	(0.021)
P value	0.396	0.011	0.108	0.064	0.080	0.084
Unobserved factors	3	2	1	1	1	1
# clusters	19	19	26	26	26	26
# treated clusters	3	3	—	—	—	—
Observations	228	228	312	312	312	312

Notes: The table reports the change in the employment rate and percentage change in the (residual) wages of the natives with no high school diploma (LTHS) and of natives with at least high school degree (HSG), using the 2004–2015 NUTS-2-by-year aggregated TURKSTAT Household Labor Force Survey. The dependent variables are the LTHS, and HSG employment counts normalized by 2011 population of the demographic group. The standard errors are clustered at NUTS-2 level. The reported *p* values are calculated using the inference methods described in the text. Columns (1) and (2) report the number of unobserved factors purged by the GSC. In other columns, the unobserved factor is calculated using pre-treatment industry-specific employment shares. Hansen's *J* statistics are insignificant at conventional levels and the *F* statistic of the first stages are greater than 10 in columns (3) and (4). 2SLS, two-stage least squares; OLS, ordinary least squares.

be positive and relatively sizable—0.063 (0.047) and 0.057 (0.023). While we cannot reject the no-effect hypothesis for the employment effect, the wage effect of the migration on native HSG workers is statistically significant. This result is in line with the documented complementarity between lower-skilled and higher-skilled workers.

Columns (3)–(6) use the 2SLS and OLS specification to estimate the effects on lower-skilled and higher-skilled workers. The findings are qualitatively in line with our preferred estimates. The main quantitative difference between the traditional specifications and the GSC arises when we focus on the native LTHS wages. The traditional models suggest a positive effect on them, whereas the GSC indicates a small negative effect. We discuss the discrepancy below and in Online Appendix B in more detail. We favor the GSC estimates in this case, as that method purges all confounders (not only those related to industry shocks) that may violate the parallel trends assumption.

Therefore, our analysis shows that 1) the native workers that are at the same skill level as the migrants have experienced small wage and employment changes statistically indistinguishable from 0 at the 5% level; and 2) wages of the relatively higher-skilled native workers have increased as a result of the Syrian migration. In the following sections, we document

channels that create new employment opportunities and enable local labor markets to absorb the shock.

Demand Channel (1): Native–Migrant Labor Complementarity

One well-documented channel in the literature is that imperfect substitution occurs between migrant and native labor. With the arrival of migrants, natives might be able to pursue job opportunities where the migrants cannot be employed. Given that the Syrian migrants cannot formally work, and they are mostly lower-skilled, we ask the following question to document the existence of this channel: Did the entry of the Syrian migrants into the lower-skilled informal labor market in the host regions cause the native LTHS workers to move toward formal jobs?

Figure 3, panel (a) confirms the presence of the channel. The share of formally employed native LTHS workers has increased rapidly starting from 2013.[10] On average, the share has increased by 3.3% (2.3%) due to the migration in the post-treatment periods. Table 4, column (1) reproduces the estimates in Figure 3. Columns (3) and (5) use the traditional models and confirm that the migration caused the native LTHS workers to find employment in formal jobs.

Alternatively, one can examine the share of workers earning at least 100% of the statutory minimum wage. Since the minimum wage is not binding for informally employed workers, a rise in the share of formally employed workers would increase the share of workers earning at least 100% of the minimum wage.

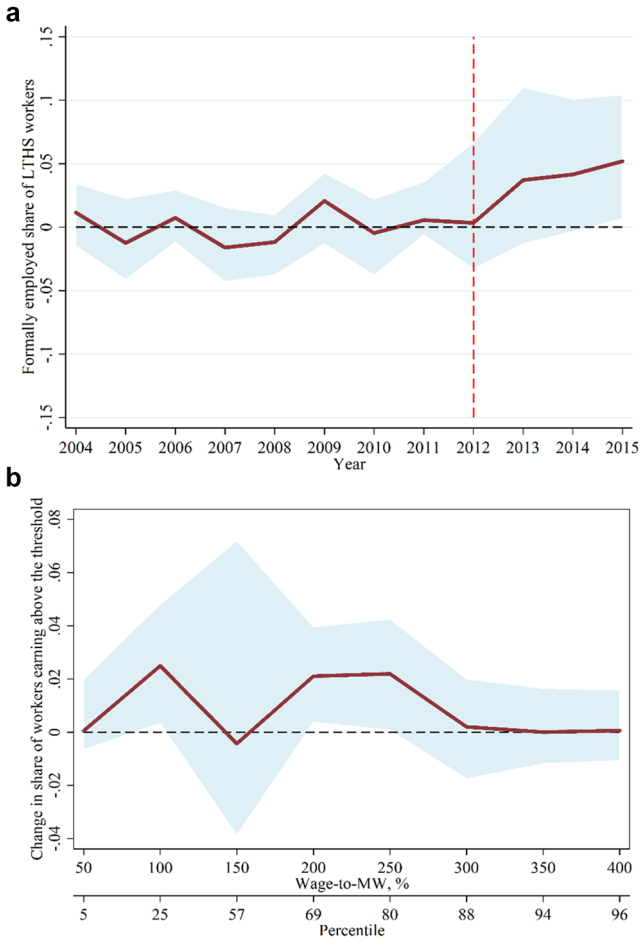
For this purpose, we construct a binary variable that takes on the value of 1 for all workers earning at least the minimum wage, and 0 otherwise. Then we partial out all the demographic effects on it by using a procedure similar to the one used in the wage regressions and time-demean for each age-by-education-by-gender group.

Table 4, columns (2), (4), and (6) show the percentage point change in the share of workers earning at least the minimum wage in the host regions. We observe a statistically significant increase of more than 2.5 percentage points in all columns. This finding suggests that compared to the counterfactual case in which no migration occurs, 2.5 percentage points more native workers in the host regions are earning at or above the minimum wage.

Figure 3, panel (b) extends the analysis to other threshold values to depict a more comprehensive picture of how the migration affected wage distribution in the host regions. We examine the changes in eight threshold

[10]Note that our argument proposing the change in the formally employed native LTHS workers is attributable to the migration would not be necessarily true if the group's skill composition changes. To address this, in Online Appendix B, we also examine how employment rates of subgroups of the native LTHS change due to the migration. We did not find an indication of a decline in employment for any of the subgroups.

Figure 3. Impact of Syrian Migration on the Share of Formally Employed LTHS Workers and Wage Distribution of Native Workers



Notes: Panel (a) plots the change in the share of formally employed, native, less than high school (LTHS) workers in the treated regions compared to the counterfactual. Panel (b) plots the percentage point change in the share of workers earning above multiples of the national minimum wage in the treated regions compared to the counterfactual. The vertical dash line indicates the first year of the migration shock. The generalized synthetic control method (GSC) is employed in both graphs. The second *x*-axis in panel (b) is the national-level average wage percentile value corresponding to the multiples of the national minimum wage. Both panels use the 2004–2015 NUTS-2-by-year aggregated TURKSTAT Household Labor Force Survey. The shaded areas show 95% confidence intervals for panels (a) and (b) calculated using the parametric bootstrap of the GSC.

values: 50%, 100%, . . ., 400% of the minimum wage. The figure offers two new insights into the effects of the migration: First, the migration has increased the share of workers earning upper-middle income. The shares of workers earning at or above 200% and 250% of the minimum wage have increased by 2.11 and 2.19 percentage points, respectively. These findings are in line with the finding of a positive wage effect on the native HSG

Table 4. Change in the Shares of Formally Employed Native LTHS Workers and Workers Earning at or above Minimum Wage (MW)

	GSC		*2SLS*		*OLS*	
	*1**	*2***	*3**	*4***	*5**	*6***
Percentage point change	0.033	0.025	0.100	0.029	0.084	0.084
	(0.023)	(0.013)	(0.021)	(0.016)	(0.023)	(0.023)
P value	0.067	0.051	0.000	0.128	0.004	0.004
Unobserved factors	2	0	1	1	1	1
# clusters	19	19	26	26	26	26
# treated clusters	3	3	—	—	—	—
Observations	228	228	312	312	312	312

Notes: The table reports the percentage point changes in formal employment shares of the natives with no high school diploma (LTHS), and in the shares of workers earning at or above the MW after the migration shock, using the 2004–2015 NUTS-2-by-year aggregated TURKSTAT Household Labor Force Survey. Standard errors are clustered at NUTS-2 level. The reported *p* values are calculated using the inference methods described in the text. Columns (1) and (2) report the number of unobserved factors purged by the generalized synthetic control (GSC). In other columns, the unobserved factor is calculated using pre-treatment industry-specific employment shares. Hansen's *J* statistics are insignificant at conventional levels and the *F* statistic of the first stages are greater than 10 in columns (3) and (4). 2SLS, two-stage least squares; OLS, ordinary least squares.
*Share of native LTHS that are formally employed; **share of workers earning at or above 100% of the MW.

workers in Table 3. They show that the Syrian migrant and the native HSG labor are complementary. Second, the migration had almost no effect on very high-wage workers in the treated regions, suggesting that the lower-skilled migration has no effect on the very high-skilled workers.

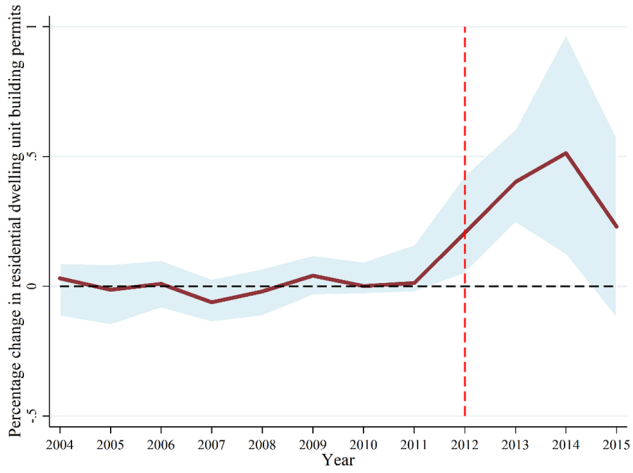
Demand Channel (2): Housing Demand

The second channel that is particularly relevant in the current case is that the arrival of migrants causes a housing demand boost. Figure 4 shows that the number of new dwelling unit building permits has increased quite rapidly since 2012, the first year of the migration wave.[11] The rise appears to reach its peak point in 2014, the year more than one million Syrian forced migrants entered Turkey. On average, the estimated effect is 0.337 (0.121), indicating a massive boom in the residential construction industry.

Table 5 reproduces the findings reported in Figure 4, and, in addition, employs alternative measurement units (squared-meter, dwelling unit, and new buildings), 2SLS (columns (4)–(6)) and OLS (columns (7)–(9)) models, and the GSC model (columns (1)–(3)) to estimate the impact of the migration on the residential building permits. In columns (1), (4), and

[11]The outcome variable is the number of building permits normalized by pre-treatment (2011) provincial GDP. We calculate the percentage change by dividing the estimate by the mean of the dependent variable.

Figure 4. Impact of the Syrian Migration on the Number of New Dwelling Unit Building Permits over Time



Notes: The figure plots the percentage change in the new dwelling unit building permits in the treated regions compared to the counterfactual, using the 2004–2015 province-by-year TURKSTAT Building Statistics. Vertical dash lines indicate the first year of the migration shock. The generalized synthetic control (GSC) method is employed to estimate the impact. The shaded area shows the 95% confidence interval, calculated using the parametric bootstrap of the GSC.

(7), we use squared-meter, whereas columns (2), (5), and (8) use dwelling units, and the remaining columns use number of buildings as the measurement unit. All columns report a sizable positive effect. When we focus on the change in the number of dwelling units in columns (2), (5), and (8), we see that the point estimates suggest an increase larger than 33.6%, and they are all statistically significant. Other columns qualitatively confirm this finding.

Demand Channel (3): Increased Entrepreneurial Activities of Syrians and Non-Syrians

Another channel through which we observe the demand effect of the migration is new firm formation. Migrants might bring capital to the destination country and start their own businesses. Moreover, the migration-induced regional demand might attract capital and lead to increased new firm formation (Baptista, Escária, and Madruga 2008; Van Stel and Suddle 2008; Karahasan 2015).

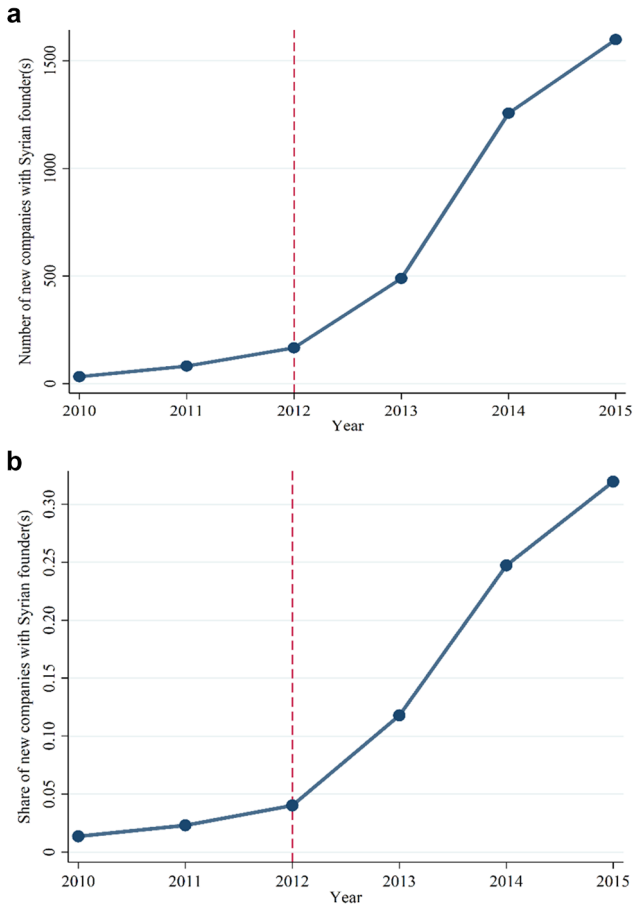
In Figure 5, panel (a), we report the change in the number of new firms with at least one Syrian cofounder between 2010 and 2015. The figure shows fewer than 100 new Syrian cofounded firms prior to 2012, but this number is 1,599 in 2015. In panel (b), we normalize the number by dividing

Table 5. Effects of the Syrian Migration on Residential Construction Sector

	GSC			*2SLS*			*OLS*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*
% change in building permits	0.497	0.337	0.246	0.523	0.496	0.337	0.314	0.336	0.191
	(0.107)	(0.121)	(0.147)	(0.180)	(0.128)	(0.071)	(0.078)	(0.063)	(0.101)
P value	0.006	0.006	0.008	0.005	0.000	0.000	0.000	0.000	0.061
Unobserved factors	0	2	2	1	1	1	1	1	1
# clusters	67	67	67	81	81	81	81	81	81
# treated clusters	5	5	5	—	—	—	—	—	—
Observations	804	804	804	972	972	972	972	972	972
Measurement unit:	m^2	Dwelling unit	Buildings	m^2	Dwelling unit	Buildings	m^2	Dwelling unit	Buildings

Notes: The table reports the percentage change in the residential building permits in the treated regions after the migration shock, using the province-by-year aggregated 2004–2015 TURKSTAT building statistics. The dependent variable is the total new building permits in m^2 (square meter), in dwelling units, and in buildings divided by 2011 gross provincial product. Standard errors are clustered at province level or the generalized synthetic control (GSC) standard errors are reported. First three columns report the number of unobserved factors purged by the GSC. In other columns, the unobserved factor is calculated using pre-treatment industry-specific employment shares. Hansen's *J* statistics are insignificant at conventional levels and the *F* statistic of the first stages are greater than 20 in columns (4) to (6). For better precision, the regressions are weighted by 2011 gross provincial product. 2SLS, two-stage least squares; OLS, ordinary least squares.

Figure 5. Number and Share of Companies with Syrian Founders in Turkey



Notes: Panel (a) plots the evolution of the number of firms founded by at least one Syrian cofounder. Panel (b) plots the share of firms founded by at least one Syrian cofounder out of all the firms founded by at least one non-native. Vertical dash lines indicate the first year of the migration shock.

it by the total number of firms cofounded by at least one non-native. This step shows that the share was less than 2.3% in 2011 and 2010, and it has increased to more than 31.9% in 2015. In addition, the shapes of the graphs in both of the panels are quite similar to the one in Figure 1, in which we report the total number of Syrian forced migrants in Turkey. This finding suggests that the evolution of the total number of the migrants in Turkey is a good predictor for the time path of the Syrian entrepreneurial activities.

However, it is not only the Syrians who founded new firms in the host regions. As shown in Table 6, the number of new firms has increased by 17.4% according to the 2SLS model and by 13.2% in the OLS models. Even when we exclude all firms with at least one Syrian cofounder, we still

Table 6. Impact of the Syrian Migration on New Company Establishments

	2SLS				*OLS*			
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*
% change	0.174	0.117	0.181	0.138	0.132	0.073	0.169	0.114
	(0.071)	(0.064)	(0.080)	(0.080)	(0.023)	(0.021)	(0.037)	(0.036)
P value	0.017	0.070	0.026	0.087	0.000	0.001	0.000	0.002
# clusters	81	81	81	81	81	81	81	81
Observations	567	567	486	486	567	567	486	486
Syrian share excluded		Yes		Yes		Yes		Yes
Outcome variable	Number of new firms	Number of new firms	Start-up capital	Start-up capital	Number of new firms	Number of new firms	Start-up capital	Start-up capital

Notes: The table reports the percentage change in the new company establishments, and real start-up capital invested in the treated regions after the migration shock, using province-by-year aggregated 2009–2015 and 2010–2015 firm statistics from The Union of Chambers and Commodity Exchanges of Turkey (TOBB). The dependent variables are the log-transformed number of new company establishments and log-transformed real start-up capital invested. The even-numbered columns exclude companies with at least one Syrian cofounder, and the Syrian capital. Standard errors clustered at province level. 2SLS, two-stage least squares; OLS, ordinary least squares.

observe a sizable increase of approximately 10%, suggesting that non-Syrian entrepreneurs also benefited from the migration.[12]

In Online Appendix D, Table D.1, we show the robustness of our main results. Alternative model specifications and other robustness checks confirm our main results.

Reconciliation with the Empirical Literature on the Syrian Migrants' Effects

In this section, we summarize Online Appendix E and document the primary reasons behind the discrepancies between the findings in this article and some of the published studies in the literature. Specifically, we answer the following question: Why do the results of Ceritoglu et al. (2017) and Akgündüz and Torun (2020) on the employment effects and those of Akgündüz et al. (2018) on the effect on the new firm formation disagree with ours?

Our examination shows two main reasons for the differences. First, controlling for regional differential recovery rates after the 2008–2009 Great Recession qualitatively changes the conclusions about the employment effects. Compared to the rest of Turkey, the host regions have experienced a relative slowdown in job creation starting in 2010. When the proposed empirical models do not account for this trend, the latter is unintentionally attributed to the migration. Hence, when we explicitly address this confounding factor using their proposed methodologies, the conclusions of

[12]We cannot employ the GSC model here, as the number of pre-treatment periods is too few (only two years) to estimate both the factor loadings and the factors.

both Ceritoglu et al. (2017) and Akgündüz and Torun (2020) qualitatively change and agree with ours.

Second, in the case of Akgündüz et al. (2018), the discrepancy between our findings about the new firm formation effects and theirs seems to be largely attributable to the irregular behavior of the synthetic control method (in the manner of Abadie et al. 2010) as implemented by the authors. In particular, the "synthetic treatment" regions in the latter study always overpredict the total number of new firms, even during the pre-treatment years (training period). Put bluntly, their synthetic control estimator is biased. In Online Appendix E, we show that the synthetic treatment region that is unbiased confirms our results.

Conclusion

Our empirical findings depict a relatively optimistic picture in terms of the effects of the migration on the native workers. We find that the native lower-skilled workers in Turkey experienced small wage and employment losses after the Syrian migration, whereas the higher-skilled workers have seen gains. To explain this, we documented the presence of three demand channels; namely, the native–migrant labor complementarity, increased housing demand, and increased entrepreneurial activities in the host regions.

One question at this point is whether and by how much the empirical findings and the predictions of the canonical economic model presented in Borjas (2013) can be reconciled. As we detail in Online Appendix C, the canonical model that assumes away the abovementioned demand channels and considers immigration merely a labor-supply shock, overpredicts the adverse effects on the native workers. It predicts that between 2011 and 2015, the wages of the native lower-skilled workers in the host regions should experience a wage decline of 4%, whereas our empirical findings suggest that the change is substantially smaller. Therefore, we conclude that omitting migration-induced demand effects in theoretical models likely leads to incorrect and relatively pessimistic predictions on the effects of immigration.

One precautionary note here is that our findings apply mostly to the short-run effects of the Syrian migration on native workers. It is possible that its long-run effects are different. On the one hand, the labor force participation of the Syrian migrants might increase over time, and, as a result, the labor supply shock might dominate the labor demand effects. On the other hand, theoretically, the potential adverse effects of the migration on the native workforce is smaller in the long run, since capital tends to accumulate in host regions, which, in turn, pulls wages upward. In addition, in the long run, it is possible that the increase in the supply of low-skilled workers alters technology choices in the industries in the host regions. Addressing these potentialities is beyond the scope of the current article, but it presents an agenda for future research.

Appendix A: Data

Table A.1. Data Appendix

Variables	*Description*	*Panel structure/Source*
Total number of Syrian guests in Turkey	Total number of Syrian migrants with temporary protection in Turkey	Annual, national level / Ministry of Interior, Directorate General of Migration Management
Province-level residence data of Syrian guests in 2015	Province-level distribution of Syrians under temporary protection in 2015	Province level / Ministry of Interior, Directorate General of Migration Management
Employment rate of Syrian guests	Employment rate of Syrian migrants at national level	National level / Balcılar and Nugent (2019)
Treatment regions (provinces)	Regions (provinces) in which the number of Syrian migrants in 2015 is more than 10% of the native population are considered treated regions. The first treatment year is 2012. Used in the DiD and the GSC.	Annual, NUTS-2 or province level / Constructed variable
Control regions (provinces)	Regions (provinces) in which the number of Syrian migrants in 2015 is less than 2% of the native population are considered control regions. Used in the DiD and the GSC.	
Native population	Total number of the native population	Annual, province level / TURKSTAT
Native working-age population	Number of the native population aged 15–64	Annual, NUTS-2 level / TURKSTAT Household Labor Force Survey
Employment	Number of the native working population aged 15–64	Individual level / TURKSTAT Household Labor Force Survey
Informal employment	Number of the native working population aged 15–64 with no social security coverage	
Age	Categorical age variable: Categories are (15–19), (20–24), . . . (60–64)	
Education	Educational level of the native population aged 15–64. Categories are less than primary school, primary school, middle school, high school, vocational high school, some college or college, graduate school	

(continued)

Table A.1. Continued

Variables	*Description*	*Panel structure/Source*
Wage	Monthly after-tax wage data of the native working population aged 15–64; includes bonuses, performance pay	
New residential building permits	Number of new building permits given for dwelling purposes, administrative data	Annual, province level / TURKSTAT
New residential occupancy permits	Number of new occupancy permits given for completed buildings for dwelling purposes, administrative data	
Total number of new company establishments	Number of new company establishments in each province, administrative data	Annual, province level / TOBB (2016)
Total number of firm establishments by Syrian founders, province level	Similar to above, only by Syrian nationals, administrative data	Annual, province level / TOBB (2016), Özpınar et al. (2015)
Total amount of start-up capital invested	Total amount of capital invested initially in new firms, administrative data	Annual, province level / TOBB (2016)
Total amount of start-up capital invested by Syrian founders	Similar to above, only by Syrian nationals, administrative data	
Gross Provincial Product	Value of all goods and services produced in a province	Annual, province level / TURKSTAT
Arabic-speaking population in 1965	Total number of people with Arabic as the first language	Province level / TURKSTAT
Total number of public employees	Total number of public employees (4/c)	Province level / Social Security Administration
Total public services investment	Public investment in housing, education, health, and other public services	Province level / Ministry of Development

Notes: DiD, difference-in-differences; GSC, generalized synthetic control; TOBB, The Union of Chambers and Commodity Exchanges of Turkey.

References

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. 2010. Synthetic control methods for comparative case studies: Estimating the effect of California's tobacco control program. *Journal of the American Statistical Association* 105(490): 493–505.

Akgündüz, Y. Emre, and Huzeyfe Torun. 2020. Two and a half million Syrian refugees, tasks and capital intensity. *Journal of Development Economics*. https://doi.org/10.1016/j.jdeveco.2020.102470.

Akgündüz, Y. Emre, Marcel van den Berg, and Wolter Hassink. 2015. The impact of refugee crises on host labor markets: The case of the Syrian refugee crisis in Turkey. IZA Discussion Paper No. 8841. Bonn, Germany: Institute for the Study of Labor.

———. 2018. The impact of the Syrian refugee crisis on firm entry and performance in Turkey. *The World Bank Economic Review* 32(1): 19–40.

Aksu, Ege, Refik Erzan, and Murat G. Kırdar. 2018. The impact of mass migration of Syrians on the Turkish labor market. IZA Discussion Paper No. 12050. Bonn, Germany: Institute for the Study of Labor.

Altındağ, Onur, Ozan Bakis, and Sandra Rozo. 2020. Blessing or burden? Impacts of refugees on businesses and the informal economy. *Journal of Development Economics*. https://doi.org/10.1016/j.jdeveco.2020.102490.

Angrist, Joshua D., and Pischke Jörn-Steffen. 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton, NJ: Princeton University Press.

Bağır, Yusuf. 2018. Impact of the Syrian refugee influx on Turkish native workers: An ethnic enclave approach. *Central Bank Review* 18: 129–47.

Bahçekapılı, Cengiz, and Buket Çetin. 2015. The impact of forced migration on regional economies: The case of Syrian refuges in Turkey. *International Business Research* 8(4): 1–15.

Bai, Jushan. 2009. Panel data models with interactive fixed effects. *Econometrica* 77(4): 1229–79.

Balcilar, Mehmet, and Jeffrey B. Nugent. 2019. The migration of fear: An analysis of migration choices of Syrian refugees. *Quarterly Review of Economics and Finance* 73: 95–110.

Baptista, Rui, Vítor Escária, and Paulo Madruga. 2008. Entrepreneurship, regional development and job creation: The case of Portugal. *Small Business Economics* 30(1): 49–58.

Bertrand, Marianne, Esther Duflo, and Sendhil Mullainathan. 2004. How much should we trust differences-in-differences estimates? *Quarterly Journal of Economics* 119(1): 249–275.

Borjas, George J. 2013. The analytics of the wage effect of immigration. *IZA Journal of Migration* 2(1): 2–22.

———. 2017. The wage impact of the *Marielitos*: A reappraisal. *ILR Review* 70(5): 1077–1110.

Borjas, George J., and Joan Monras. 2017. The labour market consequences of refugee supply shocks. *Economic Policy* 32(91): 361–413.

Cameron, A. Colin, Jonah B. Gelbach, and Douglas L. Miller. 2008. Bootstrap-based improvements for inference with clustered errors. *Review of Economics and Statistics* 90(3): 414–27.

Card, David. 2009. Immigration and inequality. *American Economic Review* 99(2): 1–21.

Card, David, and Giovanni Peri. 2016. Immigration economics by George J. Borjas: A review essay. *Journal of Economic Literature* 54(4): 1333–49.

Ceritoglu, Evren, H. Burcu Gurcihan Yunculer, Huzeyfe Torun, and Semih Tumen. 2017. The impact of Syrian refugees on natives' labor market outcomes in Turkey: Evidence from a quasi-experimental design. *IZA Journal of Labor Policy* 6: Article number 5. doi: 10.1186/s40173-017-0082-4.

Clemens, Michael A., and Jennifer Hunt. 2019. The labor market effects of refugee waves: Reconciling conflicting results. *ILR Review* 72(4): 818–57.

Constant, Amelie F. 2014. Do migrants take the jobs of native workers? *IZA World of Labor*: 10. doi: 10.15185/izawol.10.

Davidson, Russell, and James G. MacKinnon. 2010. Wild bootstrap tests for IV regression. *Journal of Business & Economic Statistics* 28(1): 128–44.

Del Carpio, Ximena V., and Mathis C. Wagner. 2015. The impact of Syrian refugees on the Turkish labor market. Policy Research Working Paper Series 7402. Washington, DC: The World Bank.

Dustmann, Christian, Uta Schönberg, and Jan Stuhler. 2016. The impact of immigration: Why do studies reach such different results? *Journal of Economic Perspectives* 30(4): 31–56.

Fallah, Belal, Caroline Krafft, and Jackline Wahba. 2019. The impact of refugees on employment and wages in Jordan. *Journal of Development Economics* 139: 203–16.

Goldsmith-Pinkham, Paul, Isaac Sorkin, and Henry Swift. 2019. Bartik instruments: What, when, why, and how. Working Paper No. w24408. Cambridge, MA: National Bureau of Economic Research. Accessed at http://www.nber.org/papers/w24408.

Howard, Greg. 2020. The migration accelerator: Labor mobility, housing, and demand. *American Economic Journal: Macroeconomics* 12(4): 147–79.

Karahasan, Burhan Can. 2015. Dynamics of regional new firm formation in Turkey. *Review of Urban & Regional Development Studies* 27(1): 18–39.

Kerr, Sari Pekkala, and William R. Kerr. 2011. Economic impacts of immigration: A survey. *Finnish Economic Papers* 24(1): 1–32.

Ottaviano, Gianmarco I. P., and Giovanni Peri. 2012. Rethinking the effect of immigration on wages. *Journal of the European Economic Association* 10(1): 152–97.

Özden, Senay. 2013. Syrian refugees in Turkey. MPC Research Report; 2013/05. European University Institute, Migration Policy Centre.

Özpınar, Esra, Seda Başıhoş, and Aycan Kulaksız. 2015. Göçün Ardından Suriye ile Ticari İlişkiler [Trade relations with Syria after the migration]. TEPAV Research Note 2015/27. Ankara, Turkey: Turkey Economic Policy Research Foundation.

Öztürkler, Harun, and Türkmen Göksel. 2015. Suriye'li mültecilerin Türkiye'ye ekonomik etkileri: Sentetik bir modelleme [The effect of Syrian refugees on Turkish economy: A synthetic model]. ORSAM Report No 196. Ankara, Turkey: Center for Middle Eastern Strategic Studies.

Peri, Giovanni. 2012. The effect of immigration on productivity: Evidence from US states. *Review of Economics and Statistics* 94(1): 348–58.

———. 2014. Do immigrant workers depress the wages of native workers? *IZA World of Labor*. doi: 10.15185/izawol.42.

———. 2016. Immigrants, productivity, and labor markets. *Journal of Economic Perspectives* 30(4): 3–29.

Peri, Giovanni, and Chad Sparber. 2009. Task specialization, immigration, and wages. *American Economic Journal: Applied Economics* 1(3): 135–69.

Tansel, Aysit, and Elif Öznur Acar. 2017. Labor mobility across the formal/informal divide in Turkey. *Journal of Economic Studies* 44(4): 627–35.

[TOBB] The Union of Chambers and Commodity Exchanges of Turkey. 2016. Şirket İstatistikleri Bülteni [Firm Statistics Bulletin]. Access at https://www.tobb.org.tr/BilgiErisimMudurlugu/Sayfalar/KurulanKapananSirketistatistikleri.php.

Üstün, Nazlı. 2016. Suriyelilerin Türk işgücü piyasasına entegrasyonu: sorunlar – öneriler [Integration of Syrians to Turkish labor markets: Problems – suggestions]. Konya Chamber of Commerce Research Report. Access at: http://www.kto.org.tr/d/file/suriyelilerin-turk-isgucu-piyasasina-entegrasyonu,-sorunlar-oneriler-nazli-ustun.pdf.

Van Stel, André, and Kashifa Suddle. 2008. The impact of new firm formation on regional development in the Netherlands. *Small Business Economics* 30(1): 31–47.

Xu, Yiqing. 2017. Generalized synthetic control method: Causal inference with interactive fixed effects models. *Political Analysis* 25(1): 57–76.

Zipperer, Ben. 2016. Did the minimum wage or the Great Recession reduce low-wage employment? Comments on Clemens and Wither (2016). Washington Center for Equitable Growth Working Paper Series. December.