EVALUATING THE IMPACT OF SYRIAN REFUGEES ON TURKEY'S LABOR MARKET: A SYNTHETIC CONTROL APPROACH

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DECLARATION OF ORIGINALITY

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ABSTRACT

Evaluating the Impact of Syrian Refugees on Turkey's Labor Market:

A Synthetic Control Approach

In this paper, the impact of recent Syrian refugee wave on natives' labor market outcomes in Turkey is analyzed. The synthetic control method is used for the analysis, where for each treated region, a synthetic control is constructed by weighting control regions in a way that pre-treatment values of treated unit is best reproduced. The analysis is made separately for NUTS-2 level regions, Hatay, Gaziantep and Sanliurfa. For men, informal employment rate decreases, while formal employment rate increases. The overall employment effect is dependent on the region. Significant increases in formal manufacturing and services sectors in Gaziantep are enough to compensate for displacement from informal jobs. In Hatay, overall employment rate decreases and in Sanliurfa unemployment increases. Wage effects are observed only in Sanliurfa, where both informal and formal wages are in decline. Women working in agriculture sector informally in Hatay are the subgroup that have been most adversely affected by immigration in terms of employment. These findings indicate that regional differences play an important role in determining the ability to absorb the labor supply shock resulting from immigration.

ÖZET

Suriyeli Göçmenlerin Türkiye İş Gücü Piyasasına Etkileri: Sentetik Kontrol Yaklaşımı

Bu makalede, yakın dönemdeki Suriyeli göç dalgasının, Türkiye yerli nüfusunu iş gücü piyasası çıktılarına etkisi analiz edildi. Analiz için sentetik kontrol metodu uygulandı. Bu metotta kontrol bölgeleri, göç alan bölgelerin göç öncesi çıktıları en iyi yeniden üretilecek şekilde ağırlıklandırılıp, bir sentetik kontrol oluşturulur. Analiz Hatay, Gaziantep ve Sanliurfa¸ NUTS-2 bölgeleri için ayrı ayrı yapıldı. Erkeklerde kayıt dışı istihdam azalırken, kayıtlı istihdamın arttığı gözlemlendi. Genel istihdam oranıysa bölgeye göre farklılık göstermektedir. Gaziantep'te kayıtlı sanayi ve hizmet sektörlerindeki istatistik olarak anlamlı artış, kayıt dışı istihdamdaki düşüşü telafi etmek için yeterlidir. Hatay'da genel istihdamın düştüğü, Şanlıurfa'da¸ ise işsizliğin arttığı gözlemlendi. Ücretler üzerinde etki sadece hem kayıt dışı hem de kayıtlı ücretlerin düştüğü Şanlıurfa'da¸ bulundu. Hatay'da kayıt dışı olarak tarım sektöründe çalışan kadınların göç dalgasından en çok etkilenen alt grup olduğu görüldü. Bu bulgular, bölgesel farklılıkların göçten kaynaklanan iş gücü arzı şokunu sönümleme kabiliyeti için önemli olduğunu göstermiştir.

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CHAPTER 1

INTRODUCTION

Immigration is arguably the most pressing current global issue. According to UN's migration report in 2017, in developed countries, the number of migrants as fraction of the total population has increased to 14% from 9.6% in 2000. This phenomenon gives rise to discussions on many fronts, from politics to culture. Populist movements gain power due to their reactionary stance against migration all over the developed world, yet hundreds of thousands continue to migrate, usually fleeing from poor living conditions and civil wars. The most recent large-scale immigration wave is the influx resulted from the Syrian Civil War that started in 2011. Over 5 million people had to leave their country, most of whom took refuge in Turkey.

A common complaint about immigrants is the belief that they get natives' jobs and cause the wages to decrease and unemployment to increase. According to this way of thinking, immigrants are more than ready to work for lower wages than native workers and dependent on their ability to substitute for natives, they push natives out of employment and to a lesser extent, out of labor force. As the labor supply increases, the wages and employment rates of natives suffer. That effect is especially apparent in cases where most of the immigrants share similar skills. If for example immigrants are low-skilled then the low-skilled natives should suffer the most, in theory. Those who support immigration, on the other hand, argue that immigration increases demand for goods and services, hence enhancing the labor market for everyone. Even if a subset of natives' wages and employment rate suffers, that is compensated with an increase in wages and employment for workers with other skill sets.

One possible way to empirically evaluate the impact of a refugee influx on natives' labor market outcomes is to use the variation in density of immigrants in different regions to get an estimate of the resulting change in wages and employment of natives. But the problem with that approach in most cases is the endogenous nature of immigrants' decision of where to live. They would naturally choose regions with already strong labor markets and avoid poorer ones. Since the destination places are then better equipped to absorb them, natives' labor market outcomes wouldn't suffer as much. This would result in an underestimation of effects of immigration.

There are several ways that have been developed over years to deal with this endogeneity problem. This paper places itself among the literature that uses natural experiments that uses an exogenous increase of immigrants in a given labor market. These events are usually political developments unrelated with the labor markets that resulted in a sizable influx of immigrants. Fidel's decision to abruptly lift the restrictions on Cubans moving to United States in 1980 is one famous example. In most of these cases, the immigrants choose their destination according to cultural or geographic factors. Hence comparing the labor market conditions in regions that are popular destinations with those that are not, might give accurate estimates of the impact of immigration. This comparison is often executed with difference-in-differences methodology, that compares the differential effect of a treatment on treated and control units.

When comparing two regions that are differentiated according to whether or not they received a large influx of immigrants, like difference-in-differences method, bring about the problem of selecting the comparison group. This selection is often arbitrary and can easily influence the result of a study. Difference-in-differences methods also make an assumption of common trend between treated and control

units before the treatment, which is difficult to verify. Synthetic control method, pioneered by Abadie and Gardeazabal (2003) is an attempt to improve the comparison unit selection by introducing a data-driven method. Instead of comparing with a single unit, a weighted average of control units is constructed according to their similarity with the treated unit in terms of predictors of the outcome variable. This approach not only takes away the arbitrariness of the researcher's decision of control unit, but also precludes extrapolation, as the synthetic control unit must be a convex combination of control units.

In this paper, synthetic control method is applied in order to understand the impact of massive Syrian refugee wave on natives' labor market outcomes in Turkey. Turkey is the country that has received the highest number of Syrian immigrants by a large margin. Within Turkey, they have mostly settled in the cities that share a border with Syria. Therefore, immigrants' choice of region within Turkey is not primarily influenced by economic conditions, producing a natural experiment. A unique feature of this immigration wave is government's restriction on immigrants working. Until recently, Syrian immigrants could work only in informal sector (without social security). Even after the ban is lifted, overwhelming majority of working Syrians continued to work informally. Hence labor supply is increased only in informal sector.

A distinguishing feature of this paper is the selection of treated regions. In other similar works that investigate the impact of Syrian refugees on Turkish labor market, either the variation in immigrant-to-native ratio among regions is used or all regions with immigrant-to-native ratio higher than a threshold is aggregated into a treatment area (Ceritoglu et al., 2017; Del Carpio and Wagner, 2015; Cengiz and Tekguc, 2018). I will analyze the impact on Hatay, Gaziantep and Sanliurfa, three

NUTS-2 regions that have highest immigrant-to-native ratio, separately. Although they are geographically close, these three regions have different demographic and labor market characteristics. Therefore, their ability to absorb the immigration wave and how their natives are affected might differ. Also, as synthetic control method relies heavily on finding an appropriate set of regions to construct the synthetic control, inability to do so decreases significance of the results. Sanliurfa suffers most heavily from this. Its results are sometimes counter-intuitive, probably resulting from the lack of convex combinations of regions in control group to reproduce its characteristics.

The findings of this study show that both men and women in informal sectors are displaced from their informal jobs as a result of Syrian immigration. The formal sectors' ability to incorporate these natives is crucial. In Gaziantep the increase in formal employment is enough to keep total employment unaffected. But in Hatay, although there is an increase in formal employment for men, total employment is still lower than the synthetic counterfactual. This result might indicate that Gaziantep has a more robust formal sector to absorb the detrimental effect of immigration. Or Hatay's demographic composition, in which ethnic Arabs constitute a major part, might have caused the Syrian immigrants to better substitute for natives. Another finding is that the biggest loser of the immigration is the informally working women in Hatay. Their employment rate is significantly lower than their synthetic counterpart and there is no evidence of an increase in formal employment. They mostly leave the labor force after being displaced from their jobs.

When the analysis is made according to the sector of employment, it is evident that the increase in formal employment of men in Gaziantep is in manufacturing and services sectors and decrease in informal employment comes

from agriculture. Employment in informal agriculture decreases for both genders in all regions. But this decline is most pronounced for women in Hatay, as almost all of their decline in informal employment is resulted from agriculture.

The outline of the paper is as follows. Chapter 2 reviews the literature on studies that analyses immigration as a natural experiment to estimate its effect of natives' labor market outcomes. Section 3 depicts the background regarding the Syrian immigration. Section 4 describes the data and presents the descriptive statistics of three treatment regions compared with national average. Section 5 summarizes the methodology employed. In section 6, results of the analysis are given. Section 7 concludes.

CHAPTER 2

LITERATURE REVIEW

The impact of immigration on native workers has long been a pivotal issue of public debate in countries that receive large numbers of immigrants. Despite the prominence of the issue, it cannot be claimed that a definitive answer has been reached. That is because of the difficulty of observing immigration, independent of the destination (both of country and region within the country) choice of immigrants. When people immigrate, all other things equal, they should tend to prefer places where there is already a strong and immigrant-friendly labor market. Therefore, when these movements are later analyzed, the effects of immigration are expected to be underestimated. This is a classic endogeneity problem. In order to overcome this problem several strategies have been developed, from production function-focused studies that try to identify the substitutability between immigrants and natives (Ottaviano and Peri, 2006) to studies that exploits the differences of immigrant-to-native ratios among regions (Altonji and Card, 1991). In this section I will focus more on literature that approaches some events in history as natural experiments to evaluate the impact of large refugee waves. Sometimes, for reasons unrelated to conditions of labor market, large groups of people leave their countries in a short period of time. These give empiricists a chance to evaluate their impact free from the endogeneity problem, as the source of immigration is exogenous and choice of destination is not influenced by existing labor market conditions.

Card (1990) is a seminal work that pioneered this natural experiment approach. In 1980 Fidel Castro announced that Cubans are free to emigrate to United States. This incident, which is called “Mariel Boatlift”, caused an increase of 7% in

Miami labor force. As the reason the marielitos chose Miami was not its labor market conditions, but the cultural structure of Miami and it was initiated by an exogenous factor, this event constitutes a natural experiment. Card applies difference-in-differences technique to evaluate to effect of Mariel influx. For labor outcome variables of interest, change in the variable after the influx is calculated for Miami and a control unit. This control unit is the average of four cities that were chosen because of their similarities with Miami in terms of ethnic distribution and economic growth trajectory before the influx. Moreover, Card calculated predicted wage and unemployment rates for Miami by fitting a linear regression equation for the wages of workers in comparison cities and using the estimated coefficients. Comparing these predicted values with the actual ones gives estimations for the effect of Mariel Boatlift. Through these analyses, Card finds no effect whatsoever on any subgroup of non-Cuban workers' wages.

Card's study on Mariel Boatlift was followed by other papers that exploits similar massive immigration waves as natural experiments. Hunt (1992) examines the effect of repatriates from Algeria to France in 1962. The effect on unemployment and wage rates of non-repatriates are estimated with a weighted least square estimation. Although results imply that repatriates increased unemployment and decreased wages, they are not conclusive. Carrington and De Lima (1996) explores repatriates to Portugal from Angola and Mozambique. Cross-country comparisons with Spain and France show increase in unemployment can be attributed to general economic downturn in Europe during late 1970s. Within-Portugal comparisons of regions shows however that the regions receiving more retodnados experienced slower growth. Friedberg (2001) addresses the emigration from Soviet Union to Israel in 1990 after the restrictions were lifted. Population of Israel increased by 12

percent. Ordinary least squares estimation shows that occupations receiving more immigrants have slower wage growth. However, that is due to the endogeneity problem caused by immigrants' choice of occupation not being independent from the existing wage distribution in Israel. When the immigrants' occupation in Israel is used as instrumental variable the effect on wages become nonexistent. Glitz (2012) examines a different kind of labor supply shock. After fall of Berlin Wall, 2.8 million ethnic Germans in Eastern Europe emigrated to Germany over 15 years. What makes this a natural experiment was Germany's decision to exogenously allocate them in order to ensure an even distribution. Glitz found some adverse unemployment effect of this emigration however no effect on wages. Aydemir and Kırdar (2013) inspects the effect of mass departure of ethnic Turks from Bulgaria in 1989 over Turkey's labor market. Similar with Germany in Glitz (2012), Turkish government had decided where to locate repatriates in previous waves of repatriates. Authors use this as an instrumental variable to better approximate a natural experiment and find that unemployment rate of native men increases 3 percent for each 10 percent increase in repatriates in labor force.

2.1 Impact of Immigration and Synthetic Control

Synthetic control method, which is also employed in this paper, has been used by some studies that investigate the effects of immigration. Two recent such studies, Borjas (2015) and Peri and Yasenov (2015) uses the synthetic control method in order to reevaluate the conclusions of (Card, 1990) paper. Although they use the same method with the same datasets, they reached different conclusions and their disagreements have been highly publicized.

Borjas (2015) is a reappraisal to Card (1990). The author claims that any study focusing on the effects of immigration should pay attention to the differences between skills of immigrants and natives. Because the most affected groups are usually the ones that have the largest share of peers in terms of skill among immigrants. Borjas criticizes Card (1990) of not separately investigating the effect on high-school dropouts after Mariel Boatlift incident and ignoring the large fraction of high-school dropouts among marielitos. In fact, 60 percent of marielitos are high-school dropouts, while only 26.7 percent of labor force participants belong to same education level. That causes an increase of 18.4 percent in low-skilled labor force. During same time interval the total increase in Miami labor force is only 8.4 percent. The log wages of high school dropouts in Miami over 1976-1984 is first presented, compared with national average of high school dropouts. Borjas accepts that the national average is not a good comparison as variation at region and city levels disappears. However, Card (1990)'s comparison units are also flawed because they were selected because of their resemblance to Miami's employment condition between 1976-1984, which also includes years after Mariel. Although pre-Mariel employment growth is strong in Miami, the four comparison cities do not exhibit similar employment growth. That causes the effects of immigration to be underestimated. Borjas contrasts that with selecting a comparison unit through synthetic control method. His dependent variable is log weekly earnings and covariates, using which the synthetic Miami will be constructed in a way that pre-Mariel Miami is best reproduced, are rate of employment growth in 4-year period prior, rate of employment growth for high school dropouts, concurrent rate of wage growth for high school dropouts. That results in a completely different control group and substantial decrease in wages in high school dropouts is reported. One limitation

in this study is the covariates Borjas chooses. These are not predictors of the outcome variables, but growth versions of the outcome variables. Hence in a sense, only outcome variables are used, which is not the encouraged practice for the method (Abadie et al., 2010; Kaul et al., 2015).

Peri and Yasenov (2015) is another paper that claims to improve upon Card (1990) by using the synthetic control method to analyze the Mariel Boatlift incident. It criticizes (Card, 1990) for not validating the choice control rigorously, since it was constructed arbitrarily. According to the author, synthetic control fixes this by introducing a data-driven approach. Also, it is claimed that the previous study's standard errors were wrong as it reflects only the uncertainty stemmed from sampling variance. But there is also the uncertainty associated with control group's potential inability to reproduce the treated group. Synthetic control method is an improvement upon this as well. It gives tools to calculate a p-value by randomly assigning treatments to units in control group. Peri and Yasenov (2015) restricts the sample to non-Cuban workers with no high-school degree. Its dependent variables are wages and unemployment rates for this group on average and at different percentiles. As covariates that best predicts these outcomes, the author uses share of dropouts, share of Hispanics, share of manufacturing workers and outcome variable for some pre-1979 years. The statistical significance procedure suggested by Abadie et al. (2015) is also applied. No significant effect on wages or unemployment of high school dropouts is found. Peri, like Card (1990) explains this by suggesting an efficient immigrant-absorbing mechanism in Miami as a result of already high percentage of immigrants. The author also contrasts his findings with that of Borjas (2015) and points out that Borjas included only men and non-Cuban in ages 25-59, which is a very small sample (only 17-24 observations per year). Borjas, in turn with his 2016

paper pointed out that, although the sample he used was indeed small, the effects were statistically significant (Borjas, 2016). Also, he criticized Peri and Yasenov (2015) for including women, other recent Hispanic immigrants and most importantly every person without a high school diploma even if they are still enrolled, in their sample. Including women is problematic, because it gives rise to a contaminating effect of increasing female labor force participation.

2.2 Studies that evaluate impact of Syrian refugees

Since it became clear how large and permanent the Syrian refugee wave will be, their effect on native's labor market outcomes have been an issue of public and academic interest. The unique situation with Syrian immigration is that they can work only in informal sector, which is a substantial part of Turkey's economy. Therefore, their effect is usually analyzed separately for formal and informal sectors. Here I will go over some of these studies.

Ceritoglu et al. (2017) is one such study. They employ a difference-in-differences methodology to evaluate the impact of the Syrian refugee wave. They use 2010-2013 labor force surveys. The treatment year is assumed to be 2012. They divide the data into a pre- and post-treatment periods of 2010-2011 and 2012-2013 respectively. Their treatment area is the 5 NUTS-2 regions which have a refugee-to-population ratio of more than 2 percent and the control regions are the 4 regions that are neighbors to the treated ones. Their sample is restricted to people at ages 15-65. The outcome variables are not in labor force, formal employment, informal employment, unemployment, informal monthly earnings and formal monthly earnings. They find a significant decrease in informal employment for both men and women. After they are no longer employed, men stay unemployed and a large

proportion of women exit the labor force. Formal employment for men increases slightly, a development authors link to the increasing humanitarian and social activities for refugees. No wage effect can be found, for neither formal nor informal sectors.

Del Carpio and Wagner (2015) also applies difference-in-differences methodology. They use 2011 and 2014 HLFS and used all 26 NUTS-2 regions, differing from Ceritoglu et al. (2017). In addition, they make use of a distance-based instrumental variable that gives a measure of distance between NUTS-2 regions in Turkey and 13 regions in Syria, in order to overcome the endogeneity of refugee flows problem. Also, they control for distance between Syrian border and regions in Turkey for taking account of possible effects from Syria-sourced economic shocks. They find significant decrease of employment in informal sector for both genders. For men with low education there is increase in formal employment, suggesting occupational upgrading. Moreover, women exit labor force more rapidly as result of immigration with declining wages.

Cengiz and Tekguc (2018) employs a variant of synthetic control method called Generalized Synthetic Control (GSC). This method, proposed by Xu (2017), generalizes the synthetic control method to multiple treatment units and periods. Unlike the two studies outlined above, they use the HLFS from 2004 to 2015. Their treated regions are the regions with highest ratio of migrant-to-natives, and control regions are the regions that have lower than 2 percent migrant-to-native ration in 2015. Therefore, they leave out seven of the twenty-six NUTS-2 regions. As labor market outcomes of interest, total employment, informal employment and employment for two different education groups are selected. Also, they did not do their analysis separately for men and women. They find no employment effect.

Wages in informal sector decreases, however the low educated subgroup's wages, which is expected to be most adversely affected from immigration, did not decrease on average as they find more formal jobs.

CHAPTER 3

BACKGROUND

Syrian civil war, which started in 2011 after protests against government turned into an armed uprising, has been arguably the biggest humanitarian crisis of 20th century so far. An important consequence of the civil war has been the massive number of Syrian people that are displaced from their homes. As war escalated, millions of Syrians from varying socioeconomic and cultural backgrounds had to flee. A large proportion of this refugee wave was absorbed by the three neighboring countries: Turkey, Lebanon and Jordan. UN estimates that there are nearly 6 million Syrian refugees in other countries, 3.5 million of which are in Turkey according to UN data.[1]

The protests that would eventually lead to the civil war first started in 2011 as what was then perceived as another instance of Arab Spring. As the scale and duration of the war was miscalculated, Turkish government administered an "open door" policy and started to set up refugee camps (Ferris, 2017). However, soon it became clear that Assad regime and the insurgents were locked in a long and devastating war. At the end of 2011 there were only 8000 Syrian refugees in Turkey, which were given shelter in tent cities. After the ceasefire negotiations failed, the numbers started to increase rapidly; there were 170000 refugees by the end of 2012, with more than 20000 new refugees every month (Ahmet, 2015). The emergence of ISIS in 2014 and Russian involvement further intensified and expanded the conflicts, paving way towards the 3.5 million refugees today.

[1] See https://data2.unhcr.org/en/situations/syria

In order to accommodate Syrian refugees, 22 camps were set up in Turkey, with the help of EU aid. Those camps are in the cities that are adjacent to Syria such as Hatay, Gaziantep, Sanliurfa, Mardin, Kilis, or the cities adjacent to former: Adana, Osmaniye and Kahramanmaras. There is a total of 260000 refugees registered in these camps.[2] That amounts to less than 7% percent of total number of refugees in Turkey. The vast majority of Syrian refugees live in cities, unregistered. However, their choice of city is mostly similar to the location of camps, even if they don't live in the camps. The largest number of off-the-camp Syrian refugees in proportion to the city population are in Hatay, Kilis, Gaziantep, which also hosts some of the largest camps. A majority of Syrian refugees cite "ease of transportation" as the most important reason why they chose Turkey as the destination . That combined with the facts that more than 77 percent of them left their country due to security reasons and a large fraction of refugees now live in border towns indicate that their choice of city was not primarily related with existing economic conditions in Turkish cities.[3]

The demographic characteristics of the Syrian refugees are crucial for evaluating their impact on Turkish economy and what parts of native labor market are affected the most. On Table A1 (Appendix A) their basic demographic characteristics are presented as of 2013, compared with the same characteristics in three regions that are the object of interest in this study. Syrian characteristics in 2017 are quite similar to that of 2013. It is apparent from the table that demographic characteristics of natives in the relevant regions and Syrian refugees are not very different. Their age profile is slightly younger, while being closest to Sanliurfa region. When education level, measured by highest level of education attained, is

[2] See AFAD 2013 at https://www.afad.gov.tr/upload/Node/3926/xfiles/syrian-refugees-in-turkey-2013_print_12_11_2013_eng.pdf
[3] Ibid

examined it can be observed that Syrian refugees have overall similar education levels with Hatay and Gaziantep natives. On the other hand, Sanliurfa residents have much lower education levels than both of the other compared regions and refugees. These results might indicate that refugees and natives have a high chance of being substitutable due to their demographic similarities. Education level in Sanliurfa is much lower, but that is in fact an advantage for refugees who seek job.

As it is generally the case with large refugee influxes, Syrian refugees labor force participation and the impact of that on natives has been a primary issue. 69% of people living in cities that share a border with Syria believe that Syrians are taking their jobs (Erdoğan, 2015). Whether or not that is true is open to discussion, however it is certain that many Syrian refugees work in Turkish firms. As of 2017, it is 36% of male and 8% of female refugees have reported they have been employed within the most recent month.[4] Work permits from government started to be issued in 2011, but the process is cumbersome and benefits of registering is not clear. Only 2100 refugees obtained a work permit in 2016 and during years that this paper examines there were no formally employed refugees.[5] Therefore Syrian refugees work almost exclusively in informal sector, which constitutes around 35% of employment in Turkey. Üstün (2016) reports that approximately 400,000 Syrians are employed informally in 2015. This causes some backlash among workers employed in informal sectors and makes refugees prone to exploitation, as they reportedly work for much lower wages (Ahmet, 2015). Textiles, construction and agriculture are sectors that employ Syrian refugees most intensively.

[4] See AFAD 2017 at https://www.afad.gov.tr/en/2601/Turkey-Response-to-Syria-Crisis
[5] Ministry of Labor and Social Security, General Directorate of Labor, Labor Statistics, Vols. 2011 2016.

Syrian refugees working in informal sector does not constitute the whole picture when it comes to their effect on Turkey's economy. Their presence by itself increased the demand for local goods and services (Del Carpio and Wagner, 2015). Border cities became hubs for humanitarian activities and Non-governmental organizations involved with the refugee crisis has created many job opportunities for natives. Moreover, border cities have experienced significant increase in exports to Syria. Their exports increased 200% from 2011 to 2014, while Turkey's overall exports to Syria increased only 11% during same period (Ferris, 2017). Many Syrian refugees also brought capital with them and the number of newly established firms with Syrian shareholders increased 40 times. Regions that share a border with Syria most benefitted from this development as well (Başıhoş et al., 2015). These circumstances render the impact of the massive Syrian refugee wave far from being clear-cut.

CHAPTER 4

DATA AND DESCRIPTIVE STATISTICS

In this paper Turkey Household Labor Force Survey, which is a repeated cross-sectional survey conducted by TUIK, the official statistics agency of government. The survey includes demographic and labor market variables. It is a large data set that includes around 300,000 observations per year. However, it is conducted at NUTS-2 level, rather than provincial. That makes it harder to isolate the regions that host Syrian refugees at the highest rate. The surveys are available from 1988, but I will use data from 2004 to 2015. My sample starts in 2004 because of the change in the survey structure in that year. Data after 2015 is not used, as the effects of immigration have a higher chance of being endogenized due to within-country movements of both natives and refugees. The year 2012 is also excluded since it is determined as the "treatment" year. The synthetic control method uses pre-treatment variables to derive post-treatment counterfactuals, rendering the data from the treatment year useless. Also, the sample is limited to ages from 18 to 64. With these restrictions, the total number of observations in the sample is more than 3.1 million.

The proportion of Syrian refugees in proportion to the native population in years 2013, 2014 and 2015 by NUTS-2 region are given on Appendix A, Table A2. The exact percentage of refugees is not relevant to this study. The refugee numbers are used in order to determine the most impacted regions, or the regions that received the treatment. I set the 5% refugee to native ratio in 2015 as the cut-off. Three NUTS-2 regions pass this test: Hatay, Gaziantep and Sanliurfa. All three of these regions share border with Syria. It is important to keep in mind that these regions include other provinces than the ones that gave them their names. For the rest of this

paper, unless otherwise indicated, Hatay is used for Hatay, Kahramanmaras, Osmaniye; Gaziantep is for Gaziantep, Kilis, Adiyaman and Sanliurfa is for Sanliurfa and Diyarbakir. The complete list of NUTS-2 regions and cities included in them can also be found on Table A2 (Appendix A).

THLFS does not include any information about Syrian refugees. In fact, there is no data set to my knowledge that presents comprehensive statistics about their labor market outcomes. Therefore, their behavior will not enter the analysis, other than determining the treated regions. However, a survey conducted by AFAD in 2017 can give an idea on their employment patterns across the country. They randomly selected 9 out of 20 cities that received highest number of Syrian refugees and surveyed the refugees. Two of these cities are Hatay and Gaziantep. The employment numbers in these cities are presented on Table A3 (Appendix A). The year of survey is out of this paper's range, but it might give a sense on where the refugees are employed. It is worth noting that Hatay has the highest share of female employment despite large number of Syrian refugees there.

Below, an overview of some descriptive statistics in Hatay, Gaziantep and Sanliurfa regions compared with national averages will be presented. That is necessary in order to analyze potential causes for dissimilar effects of immigration on these regions. In the analysis following variables will be used: age, education, employment sectors and type. In addition to these labor market outcomes such as employment, unemployment, labor force participation, wages, formal-informal employment are also given. Tables B1 and B2 (Appendix B) show pre-2012 and post-2012 regional and national averages of these variables separately for male and female population.

The working population is divided into three groups: 18-24, 25-49 and 50-64. Inspecting the averages, it can be observed that Hatay has a similar age profile with country-wide average. Gaziantep and Sanliurfa have younger populations, with latter being younger than the former. A similar ranking is also apparent when it comes to education levels. Education levels are presented as four different groups: No degree, Primary school, High school and college. The regions of interest are less educated compared with the national average. Sanliurfa is by far the least educated region among three, with "no degree" percentage of 25% for males between 2004 and 2011. The difference is even more pronounced with females. Only less than 10 percent of female population in Sanliurfa have high school degree or higher.

Each one of these three regions have agriculture-heavy economics. That is apparent from the share of agriculture in employment being higher than the national average for both males and females. Gaziantep is the region with highest share of manufacturing, while Sanliurfa is the lowest by a large margin. When the 2013-2015 averages are inspected, it can be seen that agriculture is on decline for both males and females. Manufacturing and construction increase for men and services increases for women.

Labor market outcome tables from 2004 to 2011 show that employment levels, labor force participation rates and wages are lower in Hatay, Gaziantep and Sanliurfa than the national averages (See Appendix B, Tables B3 and B4). Again, Hatay has the highest averages at all variables in both males and females, while Sanliurfa is the last. Labor force participation is especially low in Sanliurfa among women, though it is increasing as observed in 2013-2015 averages. Informal employment is high and formal employment is low in all three regions. However, the

share of formal employment in total employment follows the decreasing national trend.

All these observations paint a consistent picture. These three regions have young, less-educated populations. They have a decreasing dependence on agriculture. Informal employment is prevalent. A high proportion of informally working women is employed as unpaid family workers, while no such phenomena is observed with males. In almost every variable, Hatay has the most "developed" demographic characteristics and Sanliurfa has the least, while Gaziantep lying somewhere in between. In fact, Sanliurfa is not last in important characteristics only among these three regions. It has the lowest labor force participation, formal employment, highest proportion of young workers (18-24) and people with no education among all 26 NUTS-2 regions in Turkey. That will give rise to some problems when a counter-factual for Sanliurfa will be tried to construct.

CHAPTER 5

SYNTHETIC CONTROL METHOD

In comparative case studies, the choice of the control group is crucial for the final conclusion. Almost every such study can be considered as natural experiments. The treatment (or intervention) is externally assigned and out of the researcher's control. Natural experiments, unlike controlled experiments, bring about the problem of finding a counterfactual, as treated unit can be observed only in its treated form. Evaluating the effect of any treatment requires some approximation of what would happen to the treated unit in the absence of treatment. First developed by Abadie and Gardeazabal (2003) in a seminal paper on the effects of terrorism on growth of the economy, synthetic control method is a statistical method that aims to construct such a counterfactual through a data-driven procedure.

In essence, synthetic control method (SCM) rests on a simple idea that a combination of non-treated (comparison) units can replicate the characteristics of the treated unit better than any single comparison unit could. SCM can be seen as an extension of difference-in-differences (DiD) methods. DiD selects one or many of the comparison units that researcher deems similar to the treated unit and compares the change in the variable of interest from pre-treatment periods to post-treatment periods. According to Abadie and Gardeazabal (2003) and Abadie et al. (2010), this represents two problems. First, the choice of the comparison unit(s) is arbitrary, as it relies on the researcher's own judgement. Second, the standard errors produced by the system reflects only the sampling variance and not the uncertainty caused by the probable inability of the comparison unit to accurately reproduce treated unit's characteristics. SCM is claimed to improve on "vanilla" DiD on these two fronts.

SCM selects a set of covariates that best predict the outcome of interest. Then assigns weights to comparison units in a way that the generated weighted average is closest to pre-intervention covariate values of the treated unit. This weighted average, which is a convex combination of a subset of comparison units, is called the "synthetic control". Then the outcome of interest in post-treatment periods is calculated for the synthetic control and compared with the treated unit. This procedure results in several advantages over DiD methods. It removes the ambiguity of the comparison group selection, by installing a data-driven approach (though the method is not completely free of ambiguity in its construction of control as it will be discussed below). Another advantage of SCM is its transparency, when it comes to the weights of different comparison units in the synthetic control. That might attract some criticism as some of the weights are probable to sound counter-intuitive. However as noted by Cunningham (2018), regression also gives weights to different units, but does this in an opaque way. Therefore, the ability to inspect the weights is a plus. A further advantage over regression is the inability to extrapolate, as the synthetic control is a convex combination of comparison units.

SCM is not free from its own drawbacks. Although the selection of synthetic control units is not ambiguous, the selection of covariates is still up to researcher. That might cause some ambiguity, or worse, specification searching. Ferman et al. (2017) shows through Monte Carlo simulations that the searching for a specification that gives statistically significant results is possible. The lack of straightforward instructions regarding the selection of covariates also makes the claim less credible that the researcher is unable to access post-treatment results before applying SCM, hence increasing the objectivity of the study.

5.1 Implementation

Let there be $J + 1$ units observed over T periods. The unit 1 is subject to an intervention at period T_0. Let Y_{jt} be our outcome variable of interest of unit $j \in [1, \dots, J+1]$ observed at period t. Then we seek to estimate the following:

$$\alpha_{1t} = Y_{1t}^1 - Y_{1t}^0$$

where $t > T_0$. Y_{1t}^1 is the outcome when unit 1 is treated and Y_{1t}^0 is when it is not. In the data we only observe Y_{1t}^1, therefore in order to estimate Y_{1t}^0, we construct a vector

$$\boldsymbol{W} = \left(w_2, w_3, \dots, w_{J+1}\right)'$$

where w_j is the weight given to unit j. The synthetic control estimate of Y_{1t}^0 is $\boldsymbol{Y_{Jt}W}$, where $\boldsymbol{Y_{Jt}}$ is a $(J \times 1)$ vector populated with the values of outcome variable of untreated units.

Let $\boldsymbol{Z_1}$ be the $(N \times 1)$ vector of pre-treatment values of N predictors for unit 1 and $\boldsymbol{Z_0}$ be $(N \times J)$ matrix of same variables for untreated units. Then we select the elements of $\boldsymbol{W}^*$ through minimization of the following distance metric:

$$\min_{W} \| \boldsymbol{X_1 - X_0 W} \| = (\boldsymbol{Z_1 - Z_0 W})'\boldsymbol{V}(\boldsymbol{Z_1 - Z_0 W})$$

such that; $\sum_{j=2}^{J+1} w_j = 1$, $w_j \geq 0$ for all j and $\boldsymbol{V}$ is a diagonal $(N \times N)$ matrix. The choice of $\boldsymbol{V}$ is not trivial here, as it practically weights the importance of covariates. In order to further limit the researcher's ability to influence the results, Abadie et al. (2003) proposes selecting $\boldsymbol{V}$ in a way that the path of pre-treatment values of outcome variable is most accurately reproduced by the resulting synthetic control. By solving a nested optimization problem, weights given to different covariates best reflect their ability to predict the outcome variable.

As a result, the treatment effect is estimated as follows:

$$\hat{\alpha}_{1t} = Y_{1t}^1 - \sum_{j=2}^{J+1} w_j^* Y_{jt}$$

5.1.1 Inference

The procedure depicted above only estimates the magnitude of the treatment effect. However, to test whether the effects are significant, the method does not provide a way to calculate standard deviations. Instead Abadie 2010 proposes a permutation-based process to calculate a p-value. The treatment is assigned to every single unit regardless of whether or not they received the treatment. Then two values are calculated for each of them: pre- and post-treatment mean squared prediction errors. The former measures the (lack of) fit between the outcome variable predicted by SCM, and the latter gives the magnitude of the treatment effect. By dividing these two, we get the test statistic RMSPE, short for ratio of mean squared prediction errors. This statistic rewards high treatment effects and punishes the lack of fit in the pre-treatment periods. For unit j, we calculate it as follows:

$$RMSPE_j = \frac{\frac{1}{T - T_0} \sum_{t=T_0+1}^{T} \left(Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}\right)^2}{\frac{1}{T_0 - 1} \sum_{t=1}^{T_0-1} \left(Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}\right)^2}$$

5.2 Implementation to Syrian refugee case

In our case of Syrian refugee wave, I use this synthetic control approach and construct synthetic controls for three regions that received by far the largest number of refugees: Hatay, Gaziantep and Sanliurfa. The intervention is assumed to take place in 2012, therefore the dataset is divided into pre- and post-treatment parts, 2004-2011 and 2013-2015.The two NUTS-2 regions Adana and Mardin are excluded from the control region set, as although they don't fit the criteria for treatment, both also have high immigrant-to-native ratios. There are 26 NUTS-2 regions in Turkey. For each of the treated regions, a synthetic control is constructed from 21 untreated

regions, using some demographical and regional socio-economic characteristics and three pretreatment values (2005, 2009 and 2011) of outcome variables as covariates. The characteristics are distributions of education level, age, employment type and sectors. The outcome variables are fundamental labor market outcomes such as employment, wage and labor force participation.

One possible alternative to evaluating the effect of immigration separately on three regions could have been aggregating them into one and constructing a counterfactual for the resulting larger region. However, that would cause several problems. First, we would not be able to capture the possible heterogenous responses to immigration in these three different labor markets. There are non-trivial differences between them in terms of demographic and labor market characteristics. These differences could result in diverging effects. Constructing the counterfactual after aggregation would actually mean reproducing characteristics and pre-treatment path of the average of three regions. The resulting region would be nothing like for example, Sanliurfa. As it was mentioned in section 4, the three regions were chosen according to the criteria whether or not the migrant-to-native ratio is more than 8 percent in 2015. This might seem arbitrary, however when the list of NUTS-2 regions migrant-to-native ratios is examined, it can be observed that there is no other region that comes close to Hatay, Gaziantep and Sanliurfa. Adana and Mardin are next, but their migrant-to-native ratios are much lower.

The intervention takes place in 2012, as this is the year Syrian refugees started to immigrate in large numbers. As the available data starts in 2004, the synthetic control mirrors the predictors of labor market outcomes between 2004-2011. The demographic and labor market characteristics are averaged over this period, as it is more important to capture the distinctive features of the regions than

time series movements. In order to ensure better fit in the pre-treatment paths of labor market outcomes, three years of lagged outcome is also added. One could be tempted to use all pre-treatment outcomes for getting the best possible fit. But that is shown to render the predictors of the outcome irrelevant and potentially cause biased estimators by Kaul et al. (2015). In this study, this will be used only in case of poor pre-treatment fit. We will check whether the below par fit is a result of covariates' incapability of predicting the outcome, or the lack of a proper synthetic control in the convex hull of control units.

The outcome variables of interest can be divided into three groups: general variables like employment, wage, unemployment, labor force participation; employment, wage, sector of employment, employment type for formal and informal parts of the labor market. It is crucial to conduct the analysis separately for formal and informal sectors, as the labor supply shock initiated with the immigration wave only affects the informal sector, while the demand shock is present in both. Therefore, in theory, the labor market outcomes should behave differently after the immigration. After the analyses are made on the whole of the formal/informal sectors, the breakdown of the sectors according to employment sector (agriculture, manufacturing, services, construction) and employment type (wageworker, self-employed, employer, unpaid family worker) are also investigated in terms of the effects of the Syrian refugee wave. Also, at each step males and females are analyzed separately.

Synthetic control method is a picture-intensive method. Pictures generated with the method will be used to evaluate the effect of the treatment. These graphs depict the trajectories of outcome variables of synthetic control and the actual treated unit. The weights assigned to different control units will also be reported. In order to

quantify the effect of immigration, the average difference between the treated unit and synthetic control in years 2013-2015 will be presented. Inference will be conducted the way Abadie et al. (2010) proposes, that is through randomly assigned treatments. For each control unit a synthetic control will be constructed and RMSPE test statistic will be calculated as detailed above. If, for example Hatay is at second place in terms of RMSPE among all units in one of the outcome variables, that will return a p-value of 2/24 = 0.08.

CHAPTER 6

RESULTS

In this section, I will present the results derived from 2014-2015 HLFS data with the synthetic control method. The analysis is made for three regions separately: Hatay, Gaziantep, Sanliurfa. First, effect of massive Syrian refugee wave on total employment, unemployment and labor force participation; then on informal and formal sector employment and wages, additionally their breakdown into different employment types; and last, on employment in different sectors will be presented. The results are given in two ways: figures and tables. Tables C1-C11 (Appendix C) contain the magnitude of the effect on each treated region. That is calculated as (1) average difference between treated region and synthetic one during years 2013-2015 and (2) the same difference only in year 2015. This distinction was made because the year 2015 saw the largest jump in the number of refugees, hence analyzing it separately might allow us to observe a significant effect that is absent when averaged out. Also, the same tables present the p-values for both average effect and effect in 2015, calculated with the methodology described in section 5. To recap, in order to calculate the p-value, 22 nuts-2 regions (1 treated and 21 untreated) is ranked from highest RMSPE to lowest. If the treated region has the highest RMSPE, the p-value is 1/22 = 0.05 or if it has second largest RMSPE, p-value us 2/22 = 0.09. These two p-values will be accepted as statistically significant. If the RMSPE of treated region is ranked 3rd, then it will be counted as a suggestive evidence for an effect. On Figures D1-D19 (Appendix D), trajectories of treated and synthetic regions' outcome variables can be seen. Below each table, the weights given to each control region when the synthetic control is constructed can be found.

6.1 Employment, labor force participation and unemployment

Figures D1 and D2 (Appendix D) and Table C1 (Appendix C) report the effects on employment, labor force participation and unemployment for men and women respectively. The only significant employment effect on native men is observed in Hatay. The employment rate of men in Hatay is on average 5 percent lower than the synthetic control. Gaziantep exhibits an increase, but it is not statistically significant. In Sanliurfa there is a sharp increase in employment after the treatment year, 2012. However, it is far from being statistically significant as the pre-treatment fit is abysmal. Same phenomena are also observed with labor force participation. No set of control regions can accurately reproduce Sanliurfa, because Sanliurfa's pre-treatment values for employment and labor force participation is not in the convex hull of 21 control regions. Even if we use all pre-treatment values as covariates, pre-treatment values cannot be matched. In addition to employment effects, men in Hatay also exhibit significant negative labor force participation and positive unemployment effects. That suggest that some those who are no longer employed exited the labor force and some became unemployed.

The impact on women follows a similar pattern, only more pronounced. Employment difference between Hatay and synthetic Hatay is on average a staggering 11.5 percent, the difference in 2015 being 15 percent. There is suggestive evidence of an increase in unemployment in 2015 for Hatay, but it is apparent that women who are no longer employed mostly exited the labor force. In Gaziantep and Sanliurfa there is no effect for women.

6.2 Employment and wages in formal sector

As explained above, evaluating the effect of refugee wave separately is important in this case, as Syrians can work only in informal sector and size of informal sector in Turkey is substantial. Since only informal sector received the labor supply shock, it would be expected some natives to be displaced from their informal jobs and find formal jobs as a result of increasing demand for goods and services.

Results on formal sector can be seen at Figures D3 and D4 (Appendix D) and Table C2 (Appendix C). For men in Hatay there is suggestive evidence for increase in formal employment. For men in Gaziantep, on the other hand, the average effect on employment is positive and significant. Men in Sanliurfa experience no significant effect, but their wages decrease significantly in formal sector. That is possibly not related with Syrian immigration but increasing labor force participation of women, which was discussed above. It is also apparent that increasing formal employment in Gaziantep comes from an increase in formal wageworker employment, while no such effect is observed for Hatay or Sanliurfa. When it comes to women in formal sector, only Gaziantep in 2015 exhibits an increase in suggestive sense. These results show that other than Gaziantep, evidence on increasing formal employment in wages is weak, while any effect on wages is not found.

6.3 Employment and wages in informal sector

It was noted above that total employment of men is lower for Hatay and unchanged for Gaziantep and Sanliurfa. But formal employment increases in Gaziantep, and unchanged in Hatay and Sanliurfa. The decrease in informal employment of men in Hatay and Gaziantep shows that, the effects in formal employment is either neutralized or reversed by developments in informal sector. The share of informal

employment is in decline all over Turkey as it can be seen from Table B3 (Appendix B). But decrease in Gaziantep and Hatay is much stronger, which reflects the impact of Syrian refugees. In 2015, informal employment for men is 5.6 and 10.3 percent lower in Hatay and Gaziantep than their synthetic counterparts respectively. Informal wages are lower in Hatay and Sanliurfa. Wages in Gaziantep did not diverge from synthetic Gaziantep, which is curious as Gaziantep is the region that experiences sharpest decline in informal employment. When the impact on informal employment for men is further analyzed into different employment types, only self-employed informal workers see a significant decrease. But, for example in Gaziantep, self-employed informal worker is lower only 2.1 percent on average while total informal employment is 8.3 percent lower. The remaining 6.2 percent probably comes from wageworkers, which exhibits an insignificant decrease. The insignificance is probably due to poor fit in pre-treatment values, rather than a small effect.

For women, the sharpest decline in informal sector is observed in Hatay. Their share of informal employment is on average 7.1 percent lower than synthetic Hatay and 9.8 percent lower in 2015. Most of this effect comes from unpaid family workers and to a lesser extent self-employed ones. In Sanliurfa share of informally employed women increases.

The general effect of Syrian refugee wave on these three regions can be summarized as follows: In Hatay, employment rate of men decreases. Some of them exit labor force, while a comparable part become unemployed. The decrease in employment is because of a decrease in informal employment, as there is some evidence of increase in formal sector. Women, on the other hand, experience significant decrease in employment, all of which comes from informal sector, where they are much less employed as unpaid family workers. They exit the labor force as a

result. In Gaziantep, employment rate of men is not changed, as decrease in informal sector is compensated with an increase in formal sector. For women, decrease in informal employment is apparent. But increase in formal sector and decrease in total employment are not statistically significant. Sanliurfa is the most peculiar case here, as men in Sanliurfa experience a decline in wages in both informal and formal sectors, while women's informal employment increases.

In order to further investigate the probable causes behind these results, the impact of Syrian refugee wave on different sectors of employment is also analyzed.

6.4 Employment and wages in the informal and formal sector by the sector of employment

Tables C4-C11 (Appendix C) present the estimated impact of Syrian refugee wave on different sectors of employment; agriculture, manufacturing, construction and services. In each case separately for men, women and informal, formal. In some cases, like formal agriculture for women, the results are not supported as the sample size is minimal.

Most of the decrease in informal employment of men in Hatay is related with agriculture. Although manufacture also exhibits a significant decrease, it is agriculture that is on average 3 percent lower than synthetic Hatay. Among agricultural informal workers, self-employed are 1.7 percent lower, which is also statistically significant. Among workers who are employed in manufacture informally, wageworkers experience the only significant effect.

Decrease in women's informal employment rate in Hatay is completely attributable to decrease in agriculture. Within agriculture, both self-employed workers and unpaid family workers undergo significant decreases (former only in

2015). This might show that native women in Hatay were displaced from their agricultural jobs in great numbers due to Syrian refugee wave.

Men in Gaziantep also experience decrease in informal agriculture employment. However, they make up for it in formal services and manufacturing sectors ,with on average 8 and 3.8 percent lower than synthetic Gaziantep, respectively. No wage effect is present. As stated above, there is a decrease in informal employment for women in Gaziantep, however no effect in any sector is detected. That might be due to poor fit, as services sector exhibits a large effect in 2015, but it is insignificant.

In Sanliurfa, both men and women have significantly larger informal employment in agriculture than their synthetic counterparts. Only informal services sector exhibits significant decrease in wages for men.

CHAPTER 7

CONCLUSION

In this paper, the impact of massive Syrian refugee influx starting in 2012 on natives' labor market outcomes in Turkey is analyzed using the synthetic control method. Hatay, Gaziantep and Sanliurfa, the three NUTS-2 regions that have received immigrants in highest proportions, are examined separately. Effects on men in Hatay and Gaziantep are similar but have different magnitudes. In both regions, informal employment (and wages only in Hatay) of men decreases and formal employment increases. That is consistent with the economic theory. As labor supply for informal sector increases, some of the native informal workers are displaced from their jobs. Formal employment is also expected to increase, as previously informally employed workers will now seek formal jobs and demand for local goods and services will increase with immigration. But in Hatay, total employment of men decreases, while in Gaziantep there is no such effect. In both regions, employment of men in informal agriculture decreases. But in Gaziantep employment in formal manufacturing and services sectors increase. That might indicate Gaziantep having a more robust services and manufacturing sector. Or Syrians might be better substitutes for natives in Hatay due to ethnic composition in this region. Regardless of reason, it is apparent that men in Hatay have been displaced from their jobs as a result of immigration, and left labor force or became unemployed. The decrease in informal employment is even more pronounced for women in Hatay. Almost all of the effect comes from agriculture. We were not successful in constructing a synthetic Sanliurfa for most of the important outcome variables, as no convex combination could reproduce the pre-

treatment values. However, there are some significant results in Sanliurfa as well. Unemployment for men increases, while both formal and informal wages decreases.

This paper contributes to the literature that analyzes the impact of immigration on natives' labor market outcomes. Different responses to immigration in different regions show that one clear-cut truth for the effect of immigration might not exist. Each region should be analyzed in its terms and policy response should consider this heterogeneity.

APPENDIX A

INFORMATION ON SYRIAN REFUGEES IN TURKEY

Table A1. Demographic Characteristics of Natives vs Syrian Refugees

	Refugees		Natives			
	In Camps	Out of Camps	Hatay	Gaziantep	Sanliurfa	Turkey
Gender						
Male	51.4	51.4	50.5	50.4	50.2	49.2
Female	48.6	48.6	49.5	49.6	49.8	50.8
Age Groups						
1 - 12	36.7	34.0	25.5	28.5	33.6	24.9
13 - 18	16.3	14.9	11.2	11.8	13.6	12.2
19 - 54	42.4	45.0	49.7	48.4	44.9	48.3
55 - 64	2.8	3.7	7.2	5.9	4.1	8.0
65+	1.7	2.4	6.4	5.3	3.9	6.6
Educational Attainment						
Illiterate & No degree	17.8	28.3	23.0	27.2	42.5	34.6
Primary & Middle School	61.2	52.4	55.0	52.2	40.9	48.6
High School & Above	21.0	19.3	22.1	20.6	17.8	16.7

Note: The demographic characteristics of the Syrian refugees come from a survey conducted by AFAD in June 2013 (Syrian Refugees in Turkey, 2013 Field Survey. The demographic characteristics of natives are calculated using the Turkish Statistical Institute's population statistics. Educational attainment statistics come from Turkish Household Labor Force Survey 2013 micro data set.

Table A2. NUTS-2 Level Region Division and Migrant to Native Ratios

Region No	Region Name	Cities Included	Population	Migrant to Immigrant Ratio		
				2013	2014	2015
1	Istanbul	Istanbul	14,657,434	0.24	1.23	1.81
2	Tekirdag	Tekirdag, Edirne, Kirklareli	1,687,420	0.00	0.02	0.57
3	Balikesir	Balikesir, Canakkale	1,700,029	0.00	0.02	0.20
4	Izmir	Izmir	4,168,415	0.03	0.17	1.48
5	Aydin	Aydin, Denizli, Mugla	2,955,825	0.01	0.05	0.47
6	Manisa	Manisa, Afyonkarahisar, Kutahya, Usak	3,013,892	0.00	0.02	0.21
7	Bursa	Bursa, Eskisehir, Bilecik	3,881,624	0.06	0.28	1.62
8	Kocaeli	Kocaeli, Sakarya, Duzce, Bolu, Yalova	3,617,728	0.05	0.26	0.48
9	Ankara	Ankara	5,270,575	0.06	0.31	0.72
10	Konya	Konya, Karaman	2,372,740	0.20	1.03	1.52
11	Antalya	Antalya, Isparta, Burdur	2,968,561	0.04	0.19	0.22
12	Adana	Adana, Mersin	3,928,388	0.49	1.47	4.99
13	Hatay	Hatay, Kahramanmaras, Osmaniye	3,142,990	2.85	4.96	11.40
14	Kirikkale	Kirikkale, Nevsehir, Aksaray, Nigde	1,515,228	0.01	0.05	0.37
15	Kayseri	Kayseri, Sivas, Yozgat	2,379,113	0.04	0.22	1.35
16	Zonguldak	Zonguldak, Karabuk, Bartin	1,023,593	0.00	0.01	0.03
17	Kastamonu	Kastamonu, Cankiri, Sinop	757,711	0.00	0.00	0.07
18	Samsun	Samsun, Tokat, Corum, Amasya	2,721,221	0.01	0.04	0.11
19	Trabzon	Trabzon, Ordu, Giresun, Rize, Artvin	2,572,850	0.00	0.01	0.06
20	Erzurum	Erzurum, Erzincan, Bayburt	1,063,789	0.00	0.00	0.04
21	Agri	Agri, Kars, Igdir, Ardahan	1,131,570	0.00	0.01	0.07
22	Malatya	Malatya, Elazig, Bingol, Tunceli	1,700,468	0.30	0.30	0.94
23	Van	Van, Mus, Bitlis, Hakkari	2,124,349	0.01	0.05	0.12
24	Gaziantep	Gaziantep, Adiyaman, Kilis	2,665,265	4.89	7.23	13.43
25	Sanliurfa	Sanliurfa, Diyarbakir	3,546,516	2.58	3.93	8.58
26	Mardin	Mardin, Siirt, Batman, Sirnak	2,173,759	1.50	2.96	4.43

Note: The number of Syrian refugees for 2013 comes from AFAD. The numbers for 2014 are taken from Erdogan (2014), who draws on information from AFAD and the Ministry of Interior. The numbers for 2015 are provided by the Ministry of Interior Directorate General of Migration Management. The native populations are taken form TURKSTAT, which are publicly available. All numbers are aggregated at NUTS-2 level.

Table A3. Percentage of Syrian Immigrants Employed in Various Cities of Turkey in 2017

City	Men	Women
Adana	36.3	6.30
Bursa	68.4	4.20
Gaziantep	22.60	8.20
Hatay	32.00	16.80
Istanbul	27.70	7.60
Izmir	45.70	8.50
Kayseri	60.70	3.70
Konya	61.10	6.80
Mersin	33.10	3.60
Total	36.50	8.80

Note: The data comes from a survey conducted by AFAD in June 2017 (Syrian Refugees in Turkey, 2017 Field Survey)

APPENDIX B

DESCRIPTIVE STATISTICS

Table B1. Demographic and Sectoral Characteristics - Men

	2004-2011				2013-2015			
	Hatay	Gaziantep	Sanliurfa	Turkey	Hatay	Gaziantep	Sanliurfa	Turkey
Age Groups								
18-24	0.178	0.215	0.244	0.171	0.159	0.192	0.250	0.158
25-49	0.605	0.599	0.596	0.604	0.563	0.588	0.571	0.578
50-64	0.217	0.187	0.160	0.225	0.278	0.220	0.180	0.264
Education Levels								
No degree	0.092	0.128	0.251	0.066	0.067	0.082	0.186	0.055
Primary School	0.598	0.625	0.504	0.576	0.596	0.589	0.560	0.549
High School	0.216	0.179	0.187	0.241	0.211	0.194	0.157	0.235
College	0.095	0.068	0.058	0.117	0.125	0.135	0.097	0.161
Sectors of Employment								
Agriculture	0.187	0.231	0.244	0.183	0.147	0.152	0.238	0.184
Manufacturing	0.211	0.251	0.076	0.210	0.225	0.273	0.108	0.202
Services	0.507	0.427	0.575	0.527	0.504	0.484	0.504	0.516
Construction	0.096	0.091	0.105	0.080	0.124	0.091	0.151	0.098
# of obs.	35,562	27,889	38,147	1,092,960	12,954	13,664	13,230	436,937

Note: Data from TURKSTAT's Turkish Household LFS.

Table B2. Demographic and Sectoral Characteristics – Women

	2004-2011				2013-2015			
	Hatay	Gaziantep	Sanliurfa	Turkey	Hatay	Gaziantep	Sanliurfa	Turkey
Age Groups								
18-24	0.195	0.234	0.280	0.188	0.155	0.190	0.253	0.155
25-49	0.612	0.588	0.573	0.593	0.591	0.598	0.570	0.582
50-64	0.194	0.178	0.147	0.220	0.254	0.213	0.177	0.262
Education Levels								
No degree	0.311	0.440	0.687	0.241	0.273	0.325	0.630	0.213
Primary School	0.500	0.437	0.219	0.529	0.517	0.452	0.241	0.507
High School	0.142	0.090	0.072	0.157	0.140	0.138	0.085	0.163
College	0.048	0.033	0.022	0.074	0.071	0.086	0.044	0.117
Sectors of Employment								
Agriculture	0.524	0.521	0.666	0.455	0.370	0.357	0.562	0.388
Manufacturing	0.105	0.127	0.022	0.141	0.110	0.129	0.041	0.134
Services	0.369	0.345	0.311	0.398	0.515	0.507	0.394	0.470
Construction	0.002	0.007	0.002	0.006	0.005	0.007	0.003	0.008
# of obs.	41,298	31,200	43,857	1,184,380	14,563	14,543	14,554	462,289

Note: Data from TURKSTAT's Turkish Household LFS.

Table B3. Labor Market Outcomes for Turkish Working-Age Population – Men

	2004-2011				2013-2015			
	Hatay	Gaziantep	Sanliurfa	Turkey	Hatay	Gaziantep	Sanliurfa	Turkey
Employed	0.670	0.686	0.593	0.704	0.669	0.726	0.625	0.730
Wage	1.288	1.096	1.217	1.413	1.492	1.465	1.358	1.604
Wageworker	0.425	0.408	0.332	0.436	0.464	0.488	0.401	0.486
Self-employed	0.172	0.206	0.201	0.182	0.155	0.162	0.162	0.170
Employer	0.050	0.037	0.024	0.050	0.032	0.050	0.022	0.043
Unpaid Family Worker	0.023	0.035	0.036	0.036	0.018	0.026	0.040	0.031
In the labor force	0.789	0.813	0.688	0.786	0.773	0.788	0.770	0.795
Unemployed	0.119	0.127	0.095	0.082	0.104	0.062	0.144	0.066
Formal								
Employed	0.359	0.287	0.181	0.434	0.463	0.491	0.281	0.518
Wage	1.547	1.370	1.698	1.570	1.610	1.596	1.624	1.691
Wageworker	0.261	0.220	0.150	0.320	0.354	0.370	0.229	0.401
Self-employed	0.060	0.043	0.021	0.072	0.077	0.074	0.036	0.076
Employer	0.036	0.023	0.010	0.037	0.028	0.041	0.014	0.036
Informal								
Employed	0.311	0.399	0.412	0.269	0.205	0.235	0.344	0.211
Wage	0.752	0.726	0.791	0.915	0.950	0.967	0.911	1.086
Wageworker	0.165	0.188	0.182	0.116	0.110	0.118	0.172	0.085
Self-employed	0.112	0.163	0.181	0.11	0.078	0.088	0.126	0.094
Employer	0.013	0.015	0.015	0.012	0.004	0.009	0.008	0.007
Unpaid family worker	0.026	0.031	0.035	0.031	0.018	0.022	0.045	0.025
# of obs.	35,562	27,889	38,147	1,092,960	12,954	13,664	13,230	436,937

Note: Data from TURKSTAT's Turkish Household LFS. Wage is reported only for wageworkers

Table B4. Labor Market Outcomes for Turkish Working-Age Population – Women

	2004-2011				2013-2015			
	Hatay	Gaziantep	Sanliurfa	Turkey	Hatay	Gaziantep	Sanliurfa	Turkey
Employed	0.214	0.132	0.083	0.247	0.199	0.196	0.155	0.316
Wage	1.302	1.307	1.392	1.456	1.363	1.578	1.274	1.591
Wageworker	0.084	0.060	0.038	0.119	0.107	0.121	0.076	0.171
Self-employed	0.062	0.016	0.008	0.031	0.035	0.015	0.014	0.032
Employer	0.002	0.001	0	0.003	0.002	0.002	0	0.004
Unpaid Family Worker	0.067	0.054	0.036	0.094	0.056	0.058	0.064	0.109
In the labor force	0.249	0.145	0.088	0.279	0.241	0.216	0.175	0.354
Unemployment	0.035	0.013	0.005	0.032	0.042	0.019	0.021	0.039
Formal								
Employed	0.048	0.035	0.021	0.094	0.073	0.095	0.036	0.148
Wage	2.027	1.674	1.882	1.65	1.718	1.823	1.793	1.748
Wageworker	0.041	0.037	0.022	0.086	0.064	0.084	0.033	0.134
Self-employed	0.003	0.001	0	0.003	0.004	0.003	0	0.004
Employer	0.001	0.001	0	0.002	0.001	0.001	0	0.003
Informal								
Employed	0.166	0.096	0.062	0.153	0.128	0.104	0.116	0.167
Wage	0.575	0.635	0.643	0.822	0.73	0.688	0.65	0.887
Wageworker	0.041	0.027	0.018	0.033	0.045	0.041	0.040	0.037
Self-employed	0.064	0.014	0.008	0.028	0.033	0.012	0.012	0.028
Employer	0.001	0	0	0.001	0	0.001	0	0
Unpaid family worker	0.066	0.053	0.035	0.102	0.051	0.051	0.062	0.102
# of obs.	41,298	31,200	43,857	1,184,380	14,563	14,543	14,554	462,289

Note: Data from TURKSTAT's Turkish Household LFS. Wage is reported only for wageworkers.

APPENDIX C

SYNTHETIC CONTROL METHOD RESULTS

Table C1. Effect on Employment, Labor Force Participation and Unemployment

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.05	0.029	-0.093	-0.049	0.025	-0.069
	0.09	*0.32*	*0.68*	*0.14*	*0.41*	*0.68*
Labor Force Participation	-0.026	-0.007	-0.028	-0.035	-0.01	-0.022
	0.09	*0.95*	*0.95*	*0.09*	*0.86*	*1*
Unemployment	-0.033	-0.005	-0.073	0.038	0.007	0.078
	0.14	*1*	*0.05*	*0.05*	*0.91*	*0.05*
Female						
Employed	-0.115	-0.076	-0.105	-0.149	-0.094	-0.101
	0.05	*0.57*	*0.57*	*0.05*	*0.14*	*0.48*
Labor Force Participation	-0.106	-0.064	-0.094	-0.134	-0.087	-0.085
	0.05	*0.55*	*0.82*	*0.05*	*0.36*	*0.77*
Unemployment	0.008	-0.004	0.008	0.018	0.003	0.015
	0.18	*0.64*	*0.64*	*0.14*	*0.86*	*0.32*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C2. Effect on Employment and Wages in Formal Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	0.04	0.11	-0.025	0.049	0.122	-0.02
	0.14	*0.09*	*0.95*	*0.14*	*0.14*	*0.77*
Wage	-0.051	-0.025	-0.115	-0.065	-0.062	-0.111
	0.45	*0.95*	*0.09*	*0.41*	*0.86*	*0.14*
Wageworker	0.015	0.055	-0.019	0.015	0.047	-0.021
	0.86	*0.09*	*0.91*	*0.55*	*0.14*	*0.64*
Self-employed	0.016	0.024	0.008	0.019	0.033	0.012
	0.29	*0.29*	*0.86*	*0.33*	*0.29*	*0.57*
Female						
Employed	-0.012	0.023	0.001	-0.009	0.036	0.01
	0.5	*0.41*	*0.68*	*0.55*	*0.14*	*0.55*
Wage	-0.049	0.078	-0.04	-0.05	0.125	-0.005
	0.59	*0.68*	*0.41*	*0.5*	*0.55*	*0.95*
Wageworker	-0.018	0.024	-0.004	-0.014	0.038	0.002
	0.45	*0.32*	*0.91*	*0.64*	*0.27*	*0.91*
Self-employed	0	0.001	0	0.001	0	0
	1	*0.41*	*0.77*	*0.73*	*0.73*	*0.95*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C3. Effect on Employment and Wages in Informal Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.041	-0.083	-0.002	-0.056	-0.103	0.015
	0.14	*0.05*	*0.55*	*0.09*	*0.05*	*0.86*
Wage	*-0.112*	*-0.033*	*-0.162*	*-0.076*	*-0.023*	*-0.21*
	0.09	*0.91*	*0.09*	*0.23*	*0.59*	*0.09*
Wageworker	-0.041	-0.055	0.006	-0.047	-0.055	0.011
	0.32	*0.68*	*0.95*	*0.18*	*0.41*	*0.82*
Unpaid Family Worker	-0.007	-0.002	0.01	-0.005	-0.002	0.011
	0.14	*1*	*0.64*	*0.23*	*0.91*	*0.55*
Self-employed	-0.023	-0.021	-0.003	-0.026	-0.026	0.015
	0.05	*0.05*	*0.55*	*0.05*	*0.05*	*0.59*
Female						
Employed	-0.071	-0.019	0.059	-0.098	-0.04	0.082
	0.05	*0.68*	*0.09*	*0.05*	*0.23*	*0.05*
Wage	-0.11	-0.077	-0.204	-0.134	-0.1	-0.27
	0.59	*0.82*	*0.59*	*0.55*	*0.68*	*0.55*
Wageworker	0.005	-0.001	0.016	-0.005	-0.013	0.032
	0.36	*0.23*	*0.09*	*0.68*	*0.18*	*0.09*
Unpaid Family Worker	-0.053	-0.001	0.024	-0.066	-0.002	0.029
	0.05	*1*	*0.36*	*0.05*	*0.95*	*0.23*
Self-employed	-0.029	-0.011	-0.01	-0.036	-0.014	-0.008
	0.23	*0.36*	*0.59*	*0.09*	*0.14*	*0.64*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C4. Effect on Employment and Wages in Formal Agriculture Sector - Men

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Employed	0.009	0.016	0.008	0.014	0.022	0.008
	0.18	*0.18*	*0.45*	*0.23*	*0.23*	*0.55*
Wage	*-0.083*	*-0.198*	*-0.107*	*0.162*	*-0.132*	*-0.516*
	0.82	0.91	0.05	0.82	0.91	0.05
Wageworker	0.002	0.001	0.001	0.004	0.001	0
	0.59	*0.14*	*0.95*	*0.41*	*0.36*	*1*
Self-employed	0.008	0.012	0.007	0.009	0.015	0.007
	0.36	*0.41*	*0.41*	*0.36*	*0.45*	*0.59*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C5. Effect on Employment and Wages in Informal Agriculture Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.03	-0.028	0.025	-0.032	-0.044	0.038
	0.05	*0.05*	*0.09*	*0.09*	*0.05*	*0.09*
Wage	0.03	-0.075	-0.066	-0.056	-0.12	-0.269
	0.27	0.73	0.55	0.32	0.36	0.23
Wageworker	0.007	-0.004	0.017	0.007	-0.003	0.025
	0.73	*0.36*	*0.18*	*0.68*	*0.55*	*0.09*
Self-employed	-0.017	-0.019	0.005	-0.018	-0.027	0.008
	0.05	*0.32*	*0.41*	*0.05*	*0.27*	*0.41*
Female						
Employed	-0.074	0.001	0.048	-0.091	-0.003	0.063
	0.05	*1*	*0.05*	*0.05*	*0.95*	*0.05*
Wage	-0.117	-0.323	-0.243	-0.231	-0.515	-0.660
	0.59	*0.32*	*0.36*	*0.32*	*0.32*	*0.27*
Wageworker	-0.004	0	0.01	-0.007	-0.001	0.019
	0.68	*0.41*	*0.05*	*0.23*	*0.86*	*0.05*
Self-employed	-0.024	-0.003	-0.001	-0.028	-0.004	0
	0.14	*0.86*	*0.95*	*0.05*	*0.59*	*1*
Unpaid Family Worker	-0.074	0.001	0.048	-0.091	-0.003	0.063
	0.05	*1*	*0.05*	*0.05*	*0.95*	*0.05*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C6. Effect on Employment and Wages in Formal Manufacturing Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	0.016	0.038	-0.004	0.017	0.038	0.002
	0.73	*0.09*	*0.86*	*0.64*	*0.18*	*0.95*
Wage	-0.003	-0.014	-0.123	0.022	-0.015	-0.133
	1	*1*	*0.32*	*0.91*	*0.95*	*0.41*
Wageworker	0.016	0.022	0.005	0.013	0.018	0.011
	0.68	*0.14*	*0.68*	*0.73*	*0.32*	*0.5*
Self-employed	0.002	0.004	0	0.003	0.005	-0.001
	0.36	*0.09*	*1*	*0.18*	*0.09*	*0.5*
Female						
Employed	0	0.003	-0.001	-0.001	0.004	-0.001
	1	*0.73*	*0.68*	*0.91*	*0.5*	*0.5*
Wage	0.109	0.01	-0.011	0.024	0.112	0.023
	0.18	*0.5*	*1*	*0.64*	*0.23*	*0.91*
Wageworker	0	0.002	-0.001	0	0.003	-0.001
	0.95	*0.95*	*0.73*	*0.95*	*0.55*	*0.55*
Self-employed	0	0	0	0	0	0
	0.18	*0.5*	*0.86*	*0.45*	*0.36*	*0.5*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C7. Effect on Employment and Wages in Informal Manufacturing Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.003	0.007	0.007	-0.002	0.004	0.012
	0.05	*0.91*	*0.05*	*0.23*	*0.82*	*0.05*
Wage	-0.01	-0.024	-0.235	-0.005	-0.042	-0.218
	0.73	*0.86*	*0.32*	*1*	*0.77*	*0.36*
Wageworker	-0.001	0.006	0.003	0	0.003	0.003
	0.05	*0.91*	*0.23*	*0.68*	*0.86*	*0.27*
Self-employed	-0.001	-0.001	0.005	-0.001	-0.001	0.01
	0.27	*0.86*	*0.05*	*0.45*	*0.86*	*0.05*
Female						
Employed	-0.005	0	-0.002	-0.007	-0.006	-0.003
	0.32	*0.45*	*0.68*	*0.14*	*0.23*	*0.41*
Wage	-0.049	-0.214	-0.245	0.111	-0.131	-0.128
	0.18	*0.64*	*0.23*	*0.14*	*0.82*	*0.59*
Wageworker	-0.001	0.005	0.001	-0.002	0	-0.002
	0.5	*0.27*	*0.09*	*0.27*	*0.91*	*0.09*
Self-employed	-0.005	-0.003	-0.002	-0.007	-0.004	-0.002
	0.59	*0.23*	*0.68*	*0.23*	*0.05*	*0.41*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C8. Effect on Employment and Wages in Formal Construction Sector – Men

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.003	-0.016	-0.025	-0.003	-0.018	-0.034
	0.95	*0.23*	*0.14*	*0.73*	*0.14*	*0.09*
Wage	-0.085	0.028	-0.174	-0.103	0.077	-0.060
	0.41	*1.00*	*0.09*	*0.14*	*0.59*	*0.41*
Wageworker	-0.002	-0.005	-0.024	-0.004	-0.012	-0.033
	1	*0.55*	*0.14*	*0.82*	*0.14*	*0.09*
Self-employed	0	0	0	0.001	-0.001	0.001
	0.68	*0.95*	*0.5*	*0.59*	*0.59*	*0.23*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C9. Effect on Employment and Wages in Informal Construction Sector – Men

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.01	-0.019	0.011	-0.019	-0.027	0.001
	0.18	*0.27*	*0.82*	*0.14*	*0.18*	*0.91*
Wage	-0.061	-0.011	-0.098	-0.125	0	-0.16
	0.32	*1*	*0.45*	*0.18*	*1*	*0.23*
Wageworker	-0.011	-0.017	0.008	-0.018	-0.023	-0.001
	0.14	*0.32*	*0.82*	*0.14*	*0.14*	*0.91*
Self-employed	0.001	0.002	-0.001	-0.001	0	-0.001
	0.59	*0.5*	*0.86*	*0.59*	*0.77*	*0.59*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C10. Effect on Employment and Wages in Formal Services Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	0.03	0.08	-0.007	0.047	0.098	-0.001
	0.27	*0.09*	*1*	*0.05*	*0.05*	*1*
Wage	-0.033	0.056	-0.098	-0.016	0.03	-0.071
	0.82	*0.86*	*0.09*	*0.82*	*0.82*	*0.23*
Wageworker	0.004	0.048	0.005	0.011	0.058	0.008
	0.95	*0.18*	*1*	*0.55*	*0.09*	*0.91*
Self-employed	0.011	0.012	-0.003	0.013	0.018	0.001
	0.05	*0.09*	*1*	*0.05*	*0.05*	*0.86*
Female						
Employed	-0.018	0.018	-0.003	-0.017	0.033	0.003
	0.18	*0.5*	*0.86*	*0.27*	*0.27*	*0.91*
Wage	-0.071	0.102	-0.041	-0.052	0.138	-0.012
	0.32	*0.45*	*0.32*	*0.45*	*0.36*	*0.86*
Wageworker	-0.005	0.023	-0.01	-0.004	0.033	-0.004
	1	*0.32*	*0.68*	*0.95*	*0.18*	*0.95*
Self-employed	0	0.001	0	0.001	0.001	0
	0.68	*0.14*	*0.41*	*0.32*	*0.23*	*0.59*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

Table C11. Effect on Employment and Wages in Informal Services Sector

	Average Effect in 2013-2015			Effect in 2015		
	Hatay	Gaziantep	Sanliurfa	Hatay	Gaziantep	Sanliurfa
Male						
Employed	-0.002	-0.01	0.004	-0.01	-0.011	0.016
	0.73	*0.77*	*0.95*	*0.32*	*0.64*	*0.82*
Wage	-0.07	-0.054	-0.158	-0.012	-0.068	-0.212
	0.64	*0.73*	*0.05*	*0.86*	*0.64*	*0.05*
Wageworker	-0.005	-0.007	-0.004	-0.011	-0.01	-0.002
	0.09	*0.45*	*0.82*	*0.09*	*0.09*	*0.91*
Self-employed	0.002	-0.001	0.014	0	0.001	0.025
	0.55	*1*	*0.77*	*0.95*	*0.82*	*0.41*
Female						
Employed	0.006	-0.006	0.005	0.001	-0.015	0.016
	0.23	*0.55*	*0.23*	*0.91*	*0.41*	*0.18*
Wage	-0.16	-0.032	-0.266	-0.186	-0.1	-0.264
	0.45	*0.82*	*0.64*	*0.45*	*0.73*	*0.64*
Wageworker	0.006	-0.002	0.004	0.001	-0.009	0.014
	0.23	*0.59*	*0.32*	*0.95*	*0.45*	*0.23*
Self-employed	-0.001	-0.004	0	-0.001	-0.005	0
	0.68	*0.27*	*0.59*	*0.68*	*0.18*	*0.86*

Note: In each cell the difference between the treated and synthetic unit and the corresponding p-value is given below the magnitudes in italics. The control variables are proportions of education levels, age groups, employment types, employment levels and value of the dependent variable in years 2006, 2009 and 2011. In the first three columns the averaged difference between 2013-2015 and last three columns the difference in 2015 are given.

APPENDIX D

TREATED AND SYNTHETIC REGIONS' PATHS OF OUTCOME VARIABLES

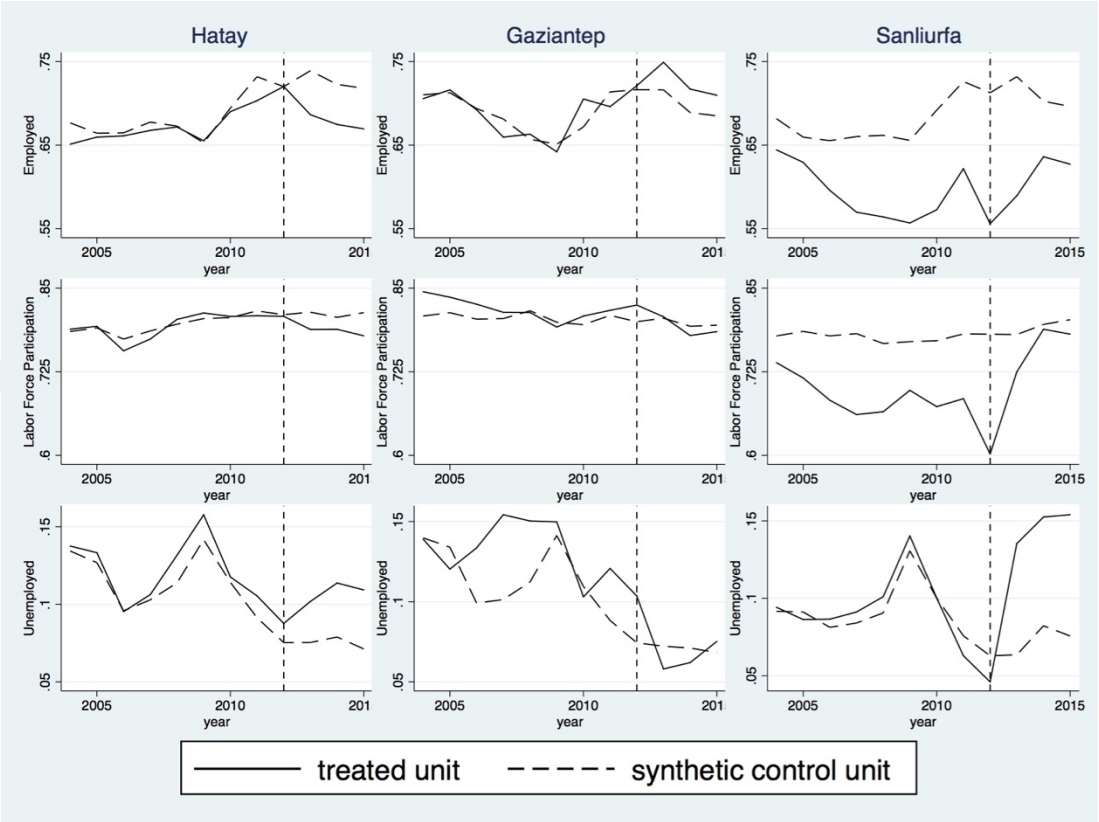

Fig. D1 Employment, labor force participation and unemployment for men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employment: Malatya, 49.1%, Izmir, 36.6%, Istanbul, 10.2%, Ankara, 4.1%, Hatay, Labor Force Participation: Konya, 27.7%, Malatya, 23.0%, Kayseri, 20.5%, Istanbul, 14.6%, Kocaeli, 13.1%, Hatay, Unemployment: Malatya, 64.5%, Van, 35.5%, Gaziantep, Employment: Van, 78.4%, Kayseri, 15.8%, Istanbul, 5.8%, Gaziantep, Labor Force Participation: Bursa, 66.5%, Agri, 22.1%, Van, 11.4%, Gaziantep, Unemployment: Malatya, 73.3%, Van, 24.6%, Istanbul, 2.1%, Sanliurfa, Employment: Malatya, 69.0%, Van, 31.0%, Sanliurfa, Labor Force Participation: Ankara, 61.0%, Balikesir, 38.8%, Sanliurfa, Unemployment: Kirikkale, 62.4%, Van, 26.4%, Ankara, 11.3%.

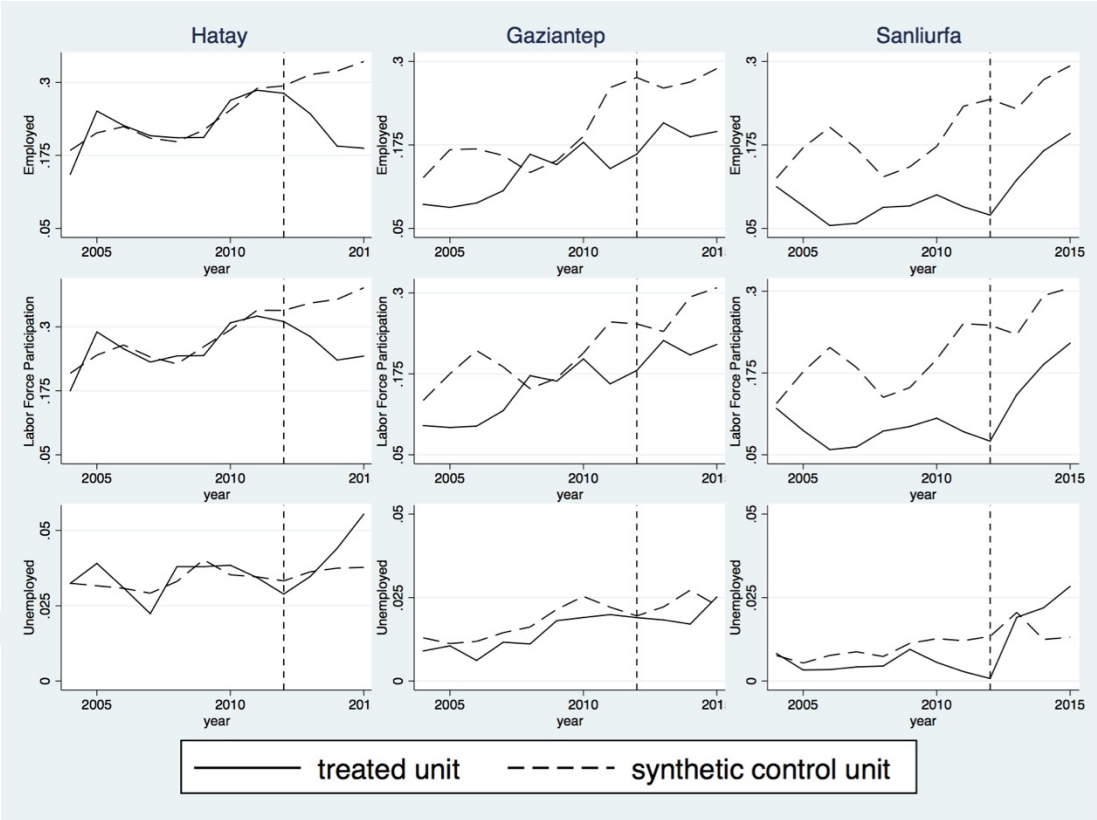

Fig. D2 Employment, labor force participation and unemployment for women
Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employment: Malatya, 49.1%, Izmir, 36.6%, Istanbul, 10.2%, Ankara, 4.1%, Hatay, Labor Force Participation: Konya, 27.7%, Malatya, 23.0%, Kayseri, 20.5%, Istanbul, 14.6%, Kocaeli, 13.1%, Hatay, Unemployment: Malatya, 64.5%, Van, 35.5%, Gaziantep, Employment: Van, 78.4%, Kayseri, 15.8%, Istanbul, 5.8%, Gaziantep, Labor Force Participation: Bursa, 66.5%, Agri, 22.1%, Van, 11.4%, Gaziantep, Unemployment: Malatya, 73.3%, Van, 24.6%, Istanbul, 2.1%, Sanliurfa, Employment: Malatya, 69.0%, Van, 31.0%, Sanliurfa, Labor Force Participation: Ankara, 61.0%, Balikesir, 38.8%, Sanliurfa, Unemployment: Kirikkale, 62.4%, Van, 26.4%, Ankara, 11.3%.

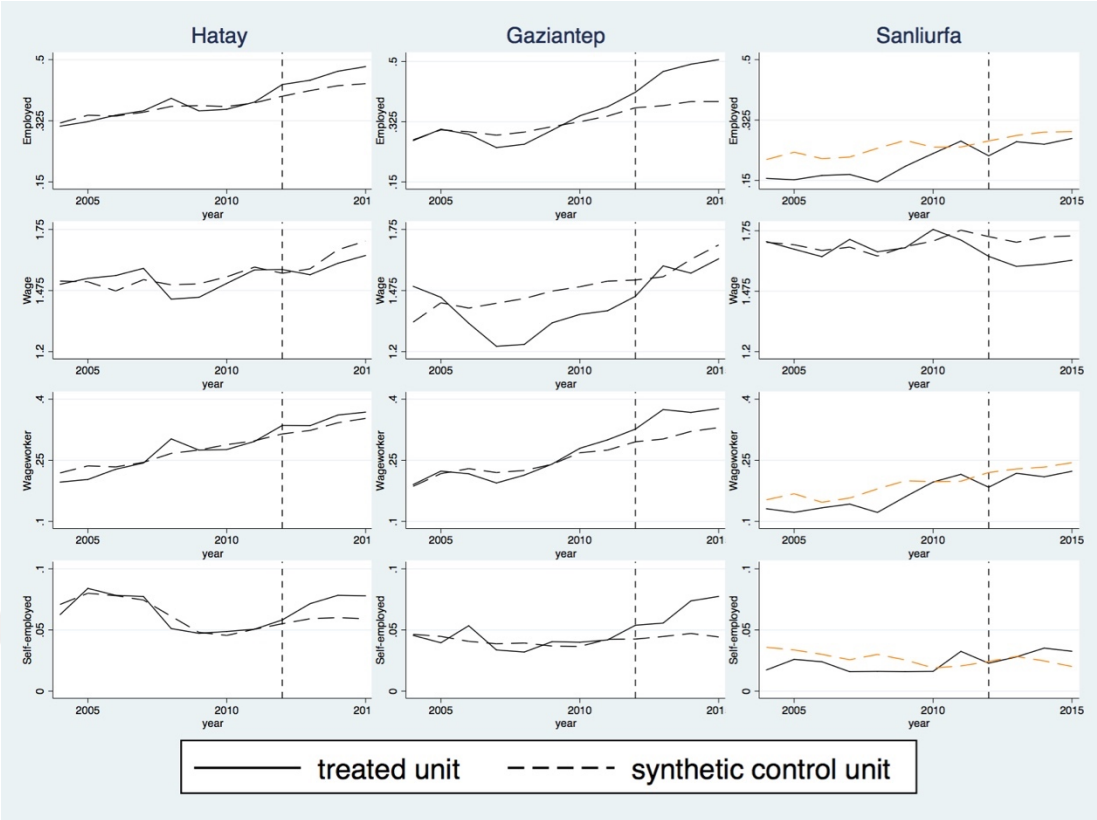

Fig. D3 Formal sector employment and wages – men

Note: Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Van, 48.7%, Balikesir, 23.7%, Istanbul, 11.9%, Bursa, 8.9%, Kayseri, 5.9%, Hatay, Wage: Aydin, 46.4%, Malatya, 39.4%, Manisa, 14.1%, Hatay, Wageworker: Van, 46.7%, Manisa, 27.3%, Istanbul, 17.2%, Balikesir, 8.8%, Hatay, Self-employed: Istanbul, 34.9%, Van, 24.0%, Konya, 17.1%, Kastamonu, 16.9%, Balikesir, 4.0%, Bursa, 3.0%, Gaziantep, Employed: Van, 42.5%, Agri, 24.9%, Manisa, 17.0%, Konya, 8.5%, Istanbul, 7.1%, Gaziantep, Wage: Manisa, 67.9%, Bursa, 18.4%, Aydin, 13.6%, Gaziantep, Wageworker: Manisa, 49.5%, Agri, 32.8%, Van, 17.7%, Gaziantep, Self-employed: Istanbul, 44.8%, Agri, 20.5%, Van, 17.5%, Bursa, 17.1%, Sanliurfa, Employed: Van, 93.9%, Ankara, 5.3%, Sanliurfa, Wage: Van, 33.3%, Malatya, 32.6%, Ankara, 21.8%, Aydin, 12.3%, Sanliurfa, Wageworker: Van, 96.6%, Istanbul, 3.4%, Sanliurfa, Self-employed: Van, 87.8%, Ankara, 8.1%, Istanbul, 4.1%.

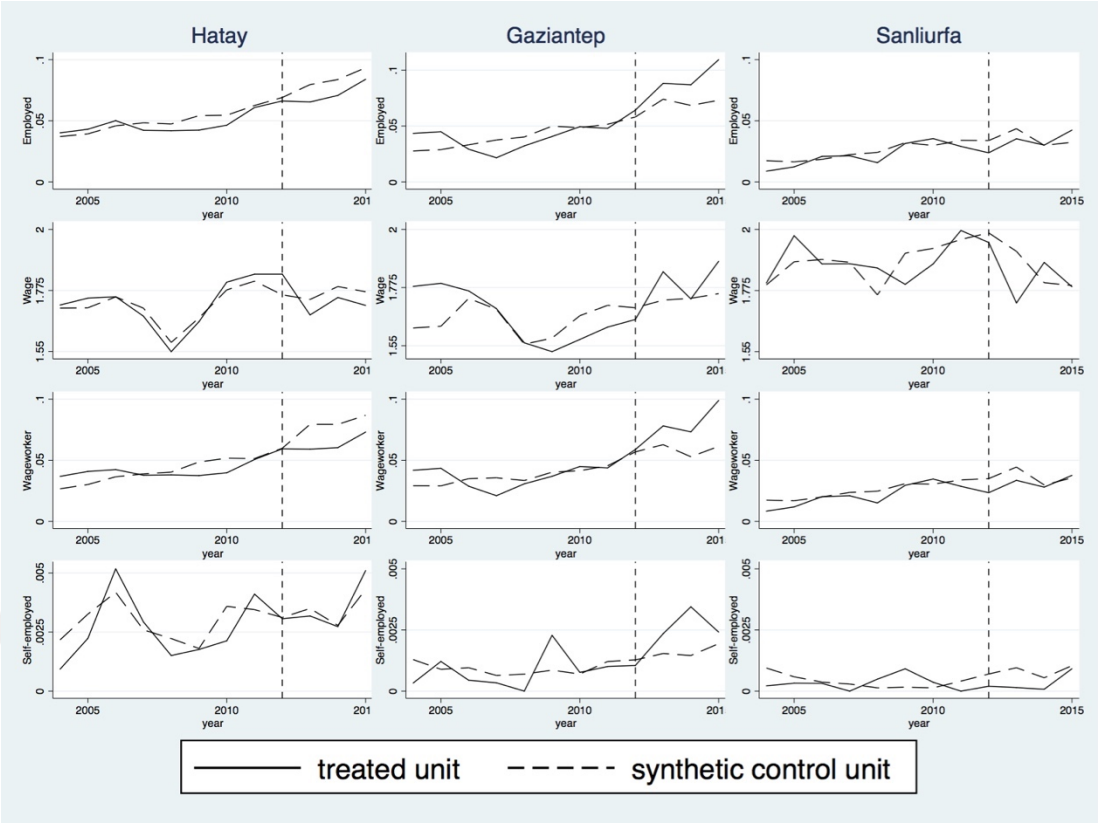

Fig. D4 Formal sector employment and wages – women

Note: Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Van, 28.5%, Trabzon, 25.1%, Malatya, 17.6%, Kayseri, 15.2%, Agri, 13.6%, Hatay, Wage: Trabzon, 53.1%, Malatya, 31.8%, Van, 10.4%, Istanbul, 3.6%, Kocaeli, 1.1%, Hatay, Wageworker: Kayseri, 50.1%, Van, 27.4%, Konya, 13.8%, Kirikkale, 8.7%, Hatay, Self-employed: Antalya, 31.5%, Van, 27.1%, Manisa, 25.3%, Kocaeli, 10.1%, Kastamonu, 5.4%, Gaziantep, Employed: Van, 56.5%, Kayseri, 25.6%, Konya, 14.9%, Istanbul, 3.0%, Gaziantep, Wage: Trabzon, 72.2%, Istanbul, 24.1%, Van, 3.7%, Gaziantep, Wageworker: Van, 46.8%, Agri, 36.8%, Kayseri, 6.4%, Istanbul, 5.6%, Trabzon, 4.4%, Gaziantep, Self-employed: Van, 74.7%, Istanbul, 23.9%, Konya, 1.4%, Sanliurfa, Employed: Van, 98.4%, Kayseri, 1.6%, Sanliurfa, Wage: Van, 64.3%, Istanbul, 23.5%, Aydin, 10.2%, Trabzon, 2.0%, Sanliurfa, Wageworker: Van, 91.7%, Kayseri, 8.3%, Sanliurfa, Self-employed: Van, 95.3%, Istanbul, 4.7%.

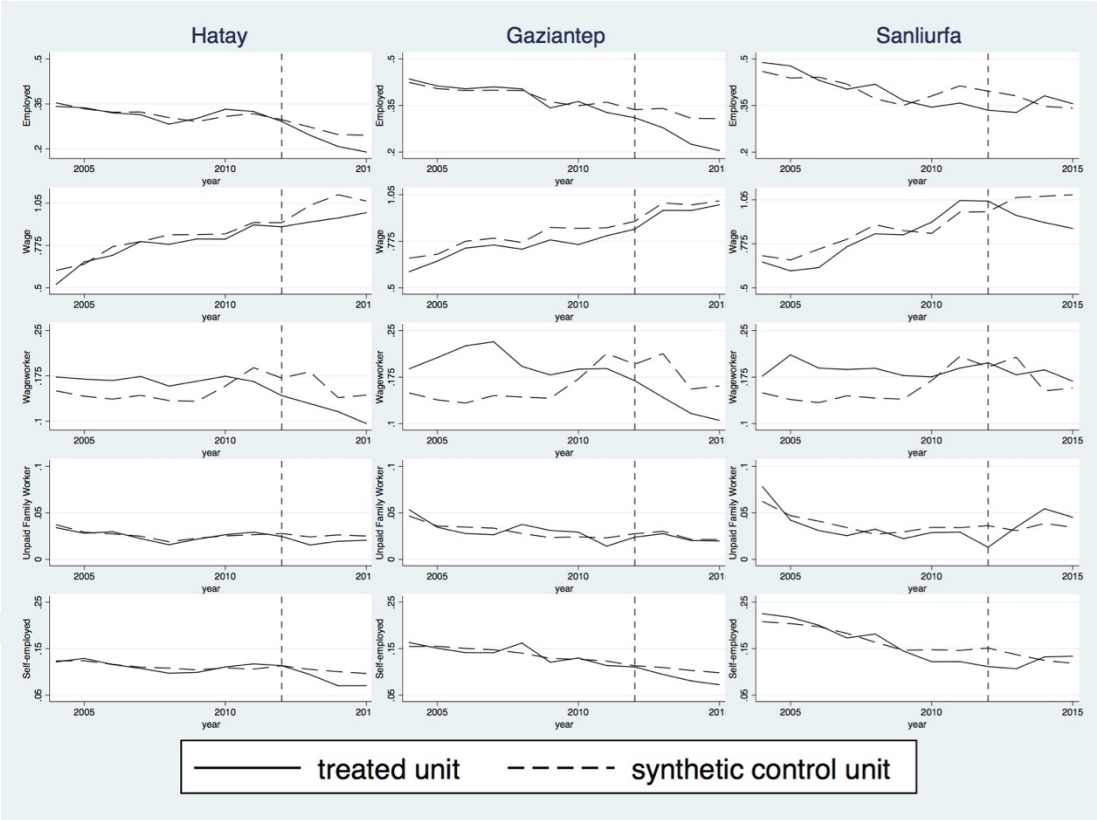

Fig. D5 Informal sector employment and wages – men

Note: Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Van, 33.2%, Konya, 25.3%, Kayseri, 20.5%, Istanbul, 19.5%, Zonguldak, 1.4%, Hatay, Wage: Agri, 50.1%, Konya,30.7%, Kirikkale, 19.2%, Hatay, Wageworker: Van, 70.9%, Istanbul, 29.1%, Hatay, Self-employed: Kocaeli, 52.8%, Van, 20.7%, Kayseri, 18.8%, Trabzon, 5.2%, Aydin, 2.6%, Hatay, Unpaid Family Worker: Izmir, 61.8%, Antalya, 19.6%, Van, 13.5%, Kayseri, 5.1%, Gaziantep, Employed: Agri, 43.2%, Bursa, 39.0%, Van, 17.9%, Gaziantep, Wage: Konya, 91.1%, Agri, 8.9%, Gaziantep, Wageworker: Van, 90.1%, Istanbul, 9.9%, Gaziantep, Self-employed: Van, 38.7%, Konya, 36.1%, Istanbul, 15.0%, Bursa, 10.2%, Gaziantep, Unpaid Family Worker: Aydin, 48.3%, Bursa, 37.1%, Van, 10.3%, Istanbul,4.4%, Sanliurfa, Employed: Van, 76.3%, Istanbul, 13.7%, Manisa, 9.9%, Sanliurfa, Wage: Kirikkale,62.1%, Malatya, 35.6%, Van, 2.3%, Sanliurfa, Wageworker: Van, 86.5%, Istanbul, 13.5%, Sanliurfa, Self-employed: Van, 61.8%, Kayseri, 38.2%, Sanliurfa, Unpaid Family Worker: Istanbul, 38.8%, Van, 31.6%, Malatya, 29.6%.

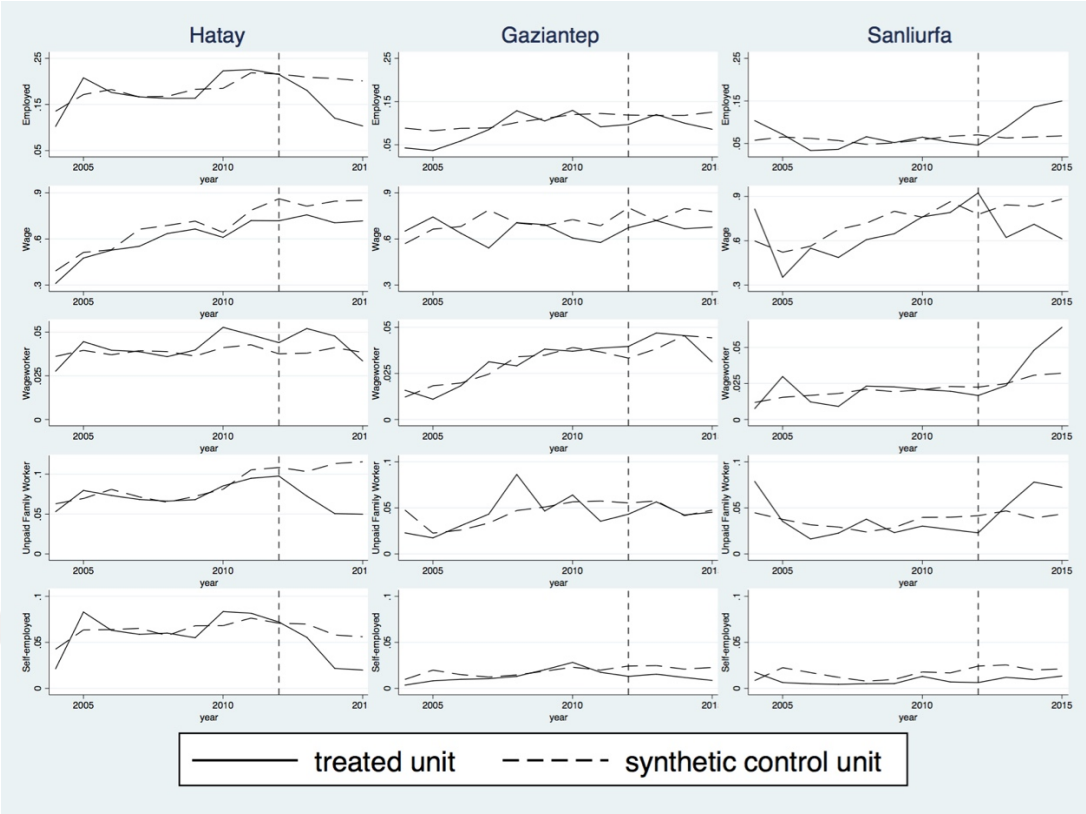

Fig. D6 Informal sector employment and wages – women

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Kocaeli, 39.6%, Van, 25.3%, Zonguldak, 23.7%, Kirikkale, 11.4%, Hatay, Wage: Van, 28.7%, Manisa, 24.0%, Konya, 23.8%, Trabzon, 17.7%, Kirikkale, 5.8%, Hatay, Wageworker: Bursa, 33.1%, Konya, 29.0%, Van, 20.6%, Antalya, 15.7%, Aydin, 1.5%, Hatay, Self-employed: Kocaeli, 51.5%, Trabzon, 31.8%, Van, 16.7%, Hatay, Unpaid Family Worker: Kocaeli, 53.4%, Van, 31.0%, Bursa, 13.1%, Kirikkale, 2.4%, Gaziantep, Employed: Istanbul, 56.4%, Konya, 31.0%, Van, 12.6%, Gaziantep, Wage: Konya, 75.2%, Kayseri, 20.1%, Bursa, 4.6%, Gaziantep, Wageworker: Konya, 74.1%, Van, 22.2%, Istanbul,3.7%, Gaziantep, Self-employed: Istanbul, 44.6%, Van, 39.0%, Konya, 16.4%, Gaziantep, Unpaid Family Worker: Istanbul, 58.0%, Konya, 42.0%, Sanliurfa, Employed: Istanbul, 92.5%, Kayseri, 7.5%, Sanliurfa, Wage: Kastamonu, 33.1%, Malatya, 31.2%, Kirikkale, 21.0%, Izmir, 10.4%, Konya, 4.2%, Sanliurfa, Wageworker: Van, 53.7%, Konya, 23.0%, Ankara, 15.5%, Istanbul, 7.8%, Sanliurfa, Self-employed: Van, 61.3%, Istanbul, 38.7%, Sanliurfa, Unpaid Family Worker: Istanbul, 69.6%, Kirikkale, 19.1%, Konya, 11.3%

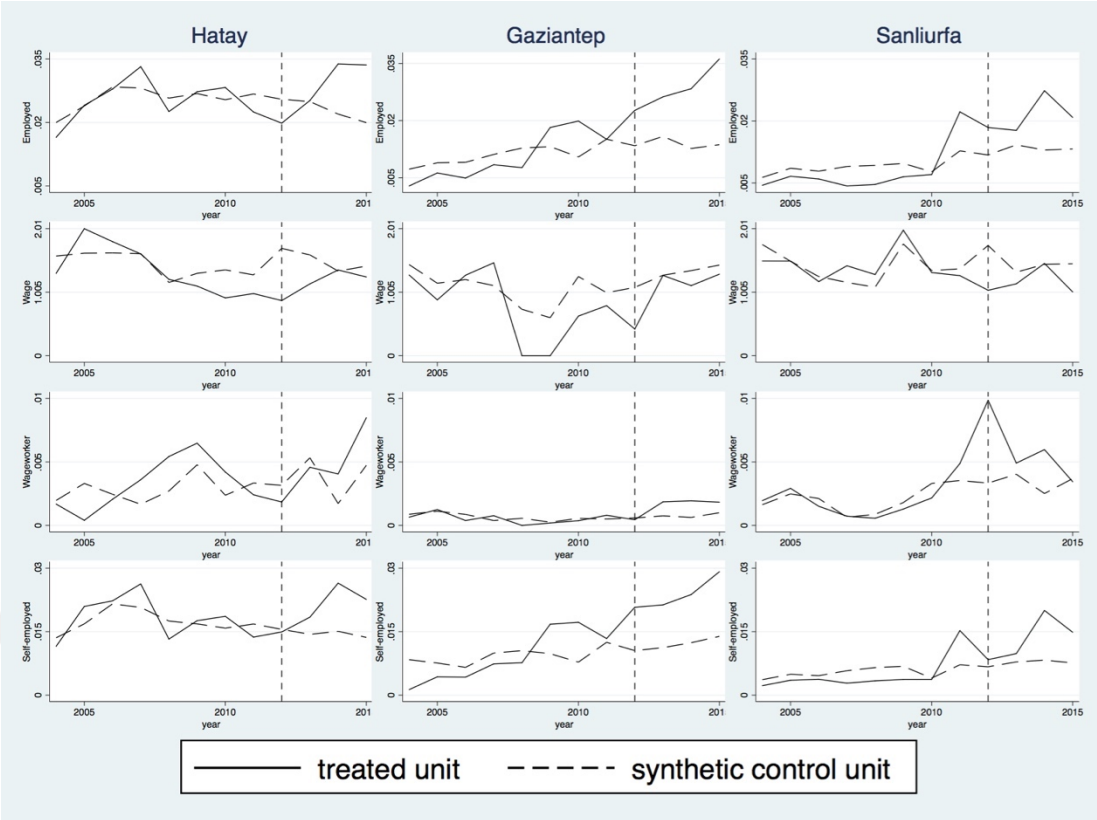

Fig. D7 Formal agriculture sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Istanbul, 39.0%, Van, 30.4%, Balikesir, 22.1%, Zonguldak, 6.9%, Kocaeli, 1.5%, Hatay, Wage: Trabzon, 27.5%, Van, 24.0%, Istanbul, 18.0%, Izmir, 13.1%, Bursa, 9.6%, Zonguldak, 7.7%, Hatay, Wageworker: Kayseri, 92.6%, Aydin, 7.4%, Hatay, Self-employed: Istanbul, 41.1%, Van, 27.8%, Balikesir, 13.6%, Zonguldak, 10.1%, Kastamonu, 6.7%, Gaziantep, Employed: Van, 41.7%, Istanbul, 32.8%, Kocaeli, 16.4%, Kayseri, 9.1%, Gaziantep, Wage: Konya, 65.6%, Agri, 20.2%, Van, 14.2%, Gaziantep, Wageworker: Istanbul, 53.1%, Van, 41.9%, Agri, 4.2%, Gaziantep, Self-employed: Van, 48.9%, Bursa, 41.7%, Istanbul, 9.4%, Sanliurfa, Employed: Van, 62.6%, Ankara, 27.1%, Kayseri, 8.9%, Istanbul, 1.4%, Sanliurfa, Wage: Malatya, 60.9%, Aydin, 14.6%, Van, 14.0%, Istanbul, 7.4%, Izmir, 3.0%, Sanliurfa, Wageworker: Van, 58.2%, Izmir, 20.5%, Aydin, 17.4%, Istanbul, 3.8%, Sanliurfa, Self-employed: Van, 62.4%, Istanbul, 18.8%, Ankara, 12.7%, Kayseri, 6.2%

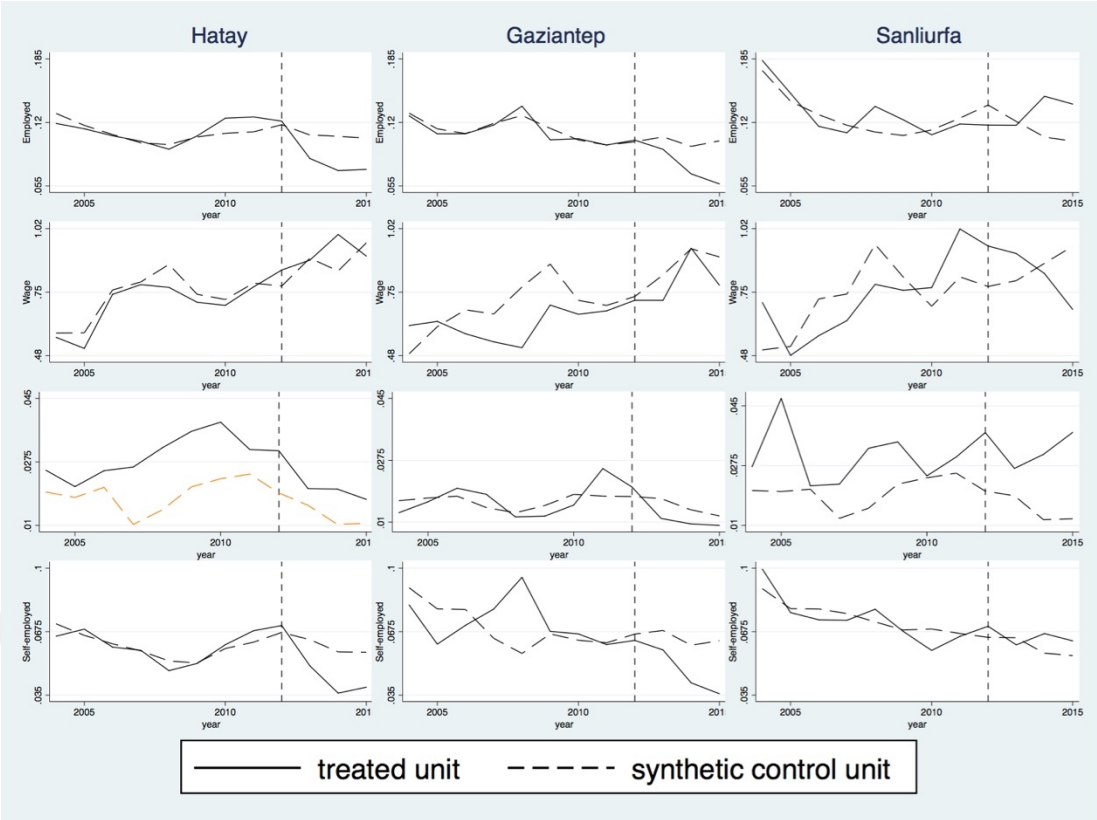

Fig. D8 Informal agriculture sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Kocaeli, 29.7%, Van, 18.4%, Konya, 17.8%, Istanbul, 15.0%, Trabzon, 12.2%, Zonguldak, 6.9%, Hatay, Wage: Van, 44.0%, Balikesir, 23.6%, Kayseri, 19.1%, Aydin, 13.3%, Hatay, Wageworker: Kirikkale, 86.9%, Bursa, 13.1%, Hatay, Self-employed: Kocaeli, 33.8%, Istanbul, 17.7%, Van, 16.1%, Konya, 14.6%, Aydin, 14.3%, Trabzon, 3.4%, Gaziantep, Employed: Istanbul, 39.1%, Agri, 25.0%, Aydin, 14.7%, Kocaeli, 10.2%, Bursa, 9.5%, Van, 1.5%, Gaziantep, Wage: Manisa, 36.6%, Agri, 22.9%, Aydin, 22.6%, Van, 10.5%, Bursa, 7.4%, Gaziantep, Wageworker: Konya, 35.5%, Van, 23.5%, Kirikkale, 22.4%, Manisa, 18.6%, Gaziantep, Self-employed: Manisa, 50.8%, Istanbul, 29.2%, Van, 14.1%, Zonguldak, 5.9%, Sanliurfa, Employed: Kayseri, 34.0%, Antalya, 28.9%, Van, 20.7%, Trabzon, 8.4%, Ankara, 8.0%, Sanliurfa, Wage: Van, 76.9%, Ankara, 23.1%, Sanliurfa, Wageworker: Kirikkale, 84.9%, Agri, 15.1%, Sanliurfa, Self-employed: Konya, 25.0%, Ankara, 23.0%, Van, 21.0%, Antalya, 20.0%, Samsun, 11.0%.

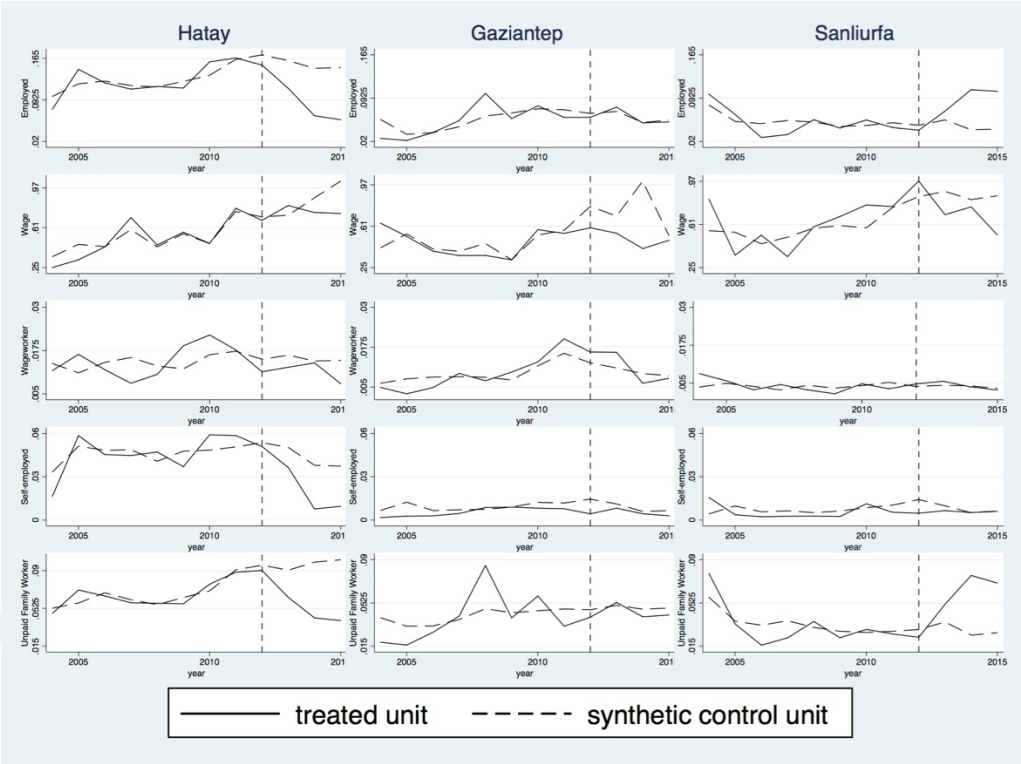

Fig. D9 Informal agriculture sector employment and wages – women

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Kocaeli, 39.8%, Van, 27.6%, Malatya, 12.0%, Zonguldak, 10.7%, Kayseri, 8.3%, Trabzon, 1.6%, Hatay, Wage: Malatya, 31.2%, Van, 28.4%, Tekirdag, 17.8%, Kocaeli, 8.3%, Kirikkale, 7.3%, Trabzon, 7.0%, Hatay, Wageworker: Aydin, 60.7%, Kirikkale, 24.2%, Trabzon, 7.7%, Konya, 7.5%, Hatay, Unpaid Family Worker: Kocaeli, 51.9%, Van, 28.5%, Bursa, 13.2%, Istanbul, 6.4%, Hatay, Self-employed: Kocaeli, 39.6%, Van, 34.3%, Trabzon, 26.1%, Gaziantep, Employed: Istanbul, 52.9%, Konya, 46.1%, Gaziantep, Wage: Konya, 46.5%, Agri, 30.2%, Istanbul, 12.5%, Van, 10.8%, Gaziantep, Wageworker: Antalya, 60.6%, Van, 19.0%, Bursa, 10.4%, Konya, 10.0%, Gaziantep, Unpaid Family Worker: Istanbul, 73.0%, Konya, 17.2%, Agri, 9.8%, Gaziantep, Self-employed: Istanbul, 32.7%, Kayseri, 30.4%, Konya, 23.0%, Van, 13.9%, Sanliurfa, Employed: Bursa, 67.9%, Istanbul, 20.7%, Konya, 11.4%, Sanliurfa, Wage: Kirikkale, 63.1%, Istanbul, 18.8%, Trabzon, 16.3%, Ankara, 1.2%, Sanliurfa, Wageworker: Balikesir, 66.7%, Konya, 23.9%, Van, 9.4%, Sanliurfa, Unpaid Family Worker: Bursa, 63.1%, Istanbul, 30.8%, Konya, 6.1%, Sanliurfa, Self-employed: Ankara, 39.2%, Kayseri, 37.0%, Istanbul, 12.0%, Van, 11.8%.

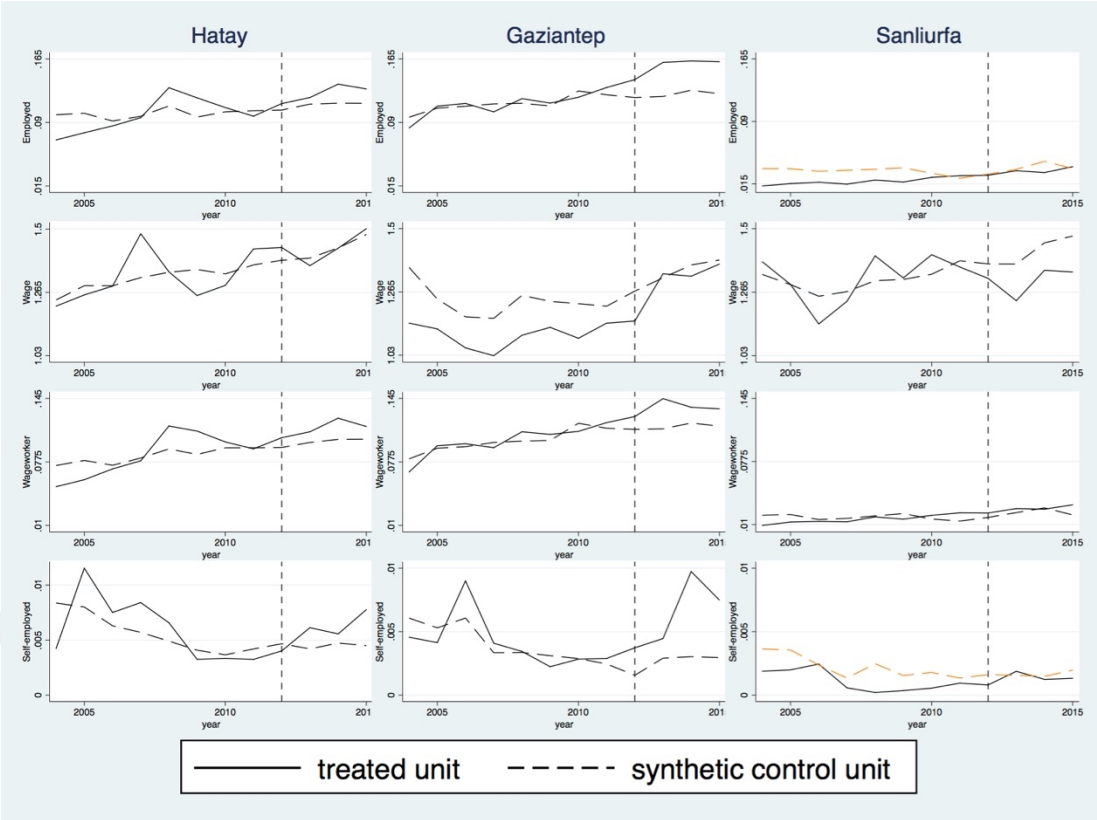

Fig. D10 Formal manufacturing sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Istanbul, 36.3%, Van, 33.5%, Balikesir, 28.2%, Manisa, 2.0%, Hatay, Wage: Aydin, 59.1%, Istanbul, 22.7%, Malatya, 16.8%, Van, 1.5%, Hatay, Wageworker: Van, 31.0%, Balikesir, 28.3%, Istanbul, 23.1%, Manisa, 16.8%, Hatay, Self-employed: Istanbul, 36.4%, Konya, 16.7%, Balikesir, 16.6%, Van, 13.9%, Manisa, 8.9%, Agri, 6.5%, Gaziantep, Employed: Manisa, 49.8%, Van, 30.2%, Istanbul, 20.0%, Gaziantep, Wage: Konya, 87.8%, Malatya, 12.2%, Gaziantep, Wageworker: Manisa, 53.5%, Van, 28.1%, Istanbul, 18.4%, Gaziantep, Self-employed: Kocaeli, 65.4%, Van, 17.9%, Agri, 9.4%, Bursa, 7.3%, Sanliurfa, Employed: Van, 88.1%, Ankara, 11.9%, Sanliurfa, Wage: Malatya, 38.3%, Konya, 31.8%, Ankara, 27.2%, Istanbul, 1.6%, Van, 1.1%, Sanliurfa, Wageworker: Van, 91.0%, Malatya, 9.0%, Sanliurfa, Self-employed: Van, 78.5%, Istanbul, 15.9%, Ankara, 5.7%.

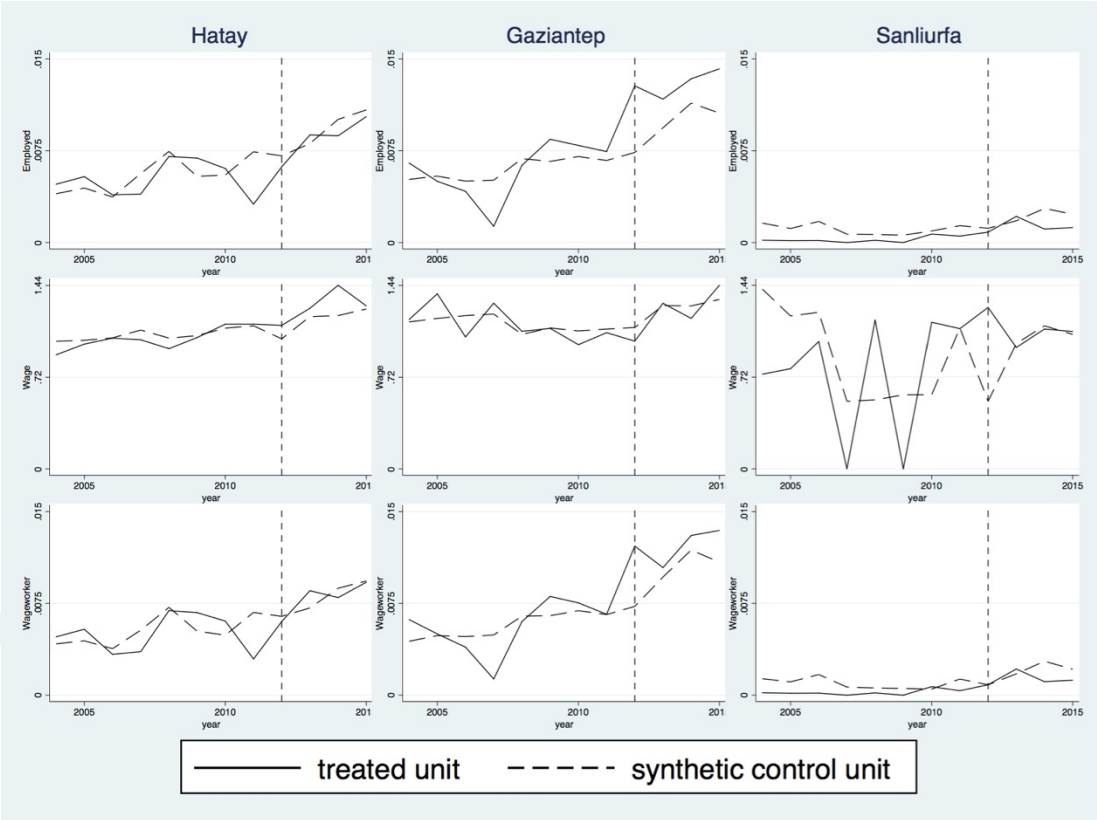

Fig. D11 Formal manufacturing sector employment and wages – women
Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Kirikkale, 67.4%, Van, 12.6%, Ankara, 9.4%, Konya, 8.1%, Trabzon, 2.3%, Hatay, Wage: Trabzon, 77.1%, Zonguldak, 22.9%, Hatay, Wageworker: Kirikkale, 50.0%, Van, 27.5%, Ankara, 16.1%, Trabzon, 6.1%, Hatay, Self-employed: Kirikkale, 62.9%, Kocaeli, 28.0%, Zonguldak, 6.4%, Van, 2.7%, Gaziantep, Employed: Van, 48.4%, Ankara, 32.9%, Konya, 18.4%, Gaziantep, Wage: Kocaeli, 46.8%, Konya, 42.4%, Van, 5.8%, Agri, 5.0%, Gaziantep, Wageworker: Van, 42.8%, Konya, 31.2%, Ankara, 26.0%, Gaziantep, Self-employed: Van, 37.3%, Bursa, 31.6%, Malatya, 24.7%, Kocaeli, 5.2%, Trabzon, 1.2%, Sanliurfa, Employed: Van, 95.9%, Ankara, 4.1%, Sanliurfa, Wage: Kastamonu, 56.0%, Van, 44.0%, Sanliurfa, Wageworker: Van, 95.5%, Ankara, 2.7%, Antalya, 1.7%, Sanliurfa, Self-employed: Van, 94.4%, Ankara, 5.6%.

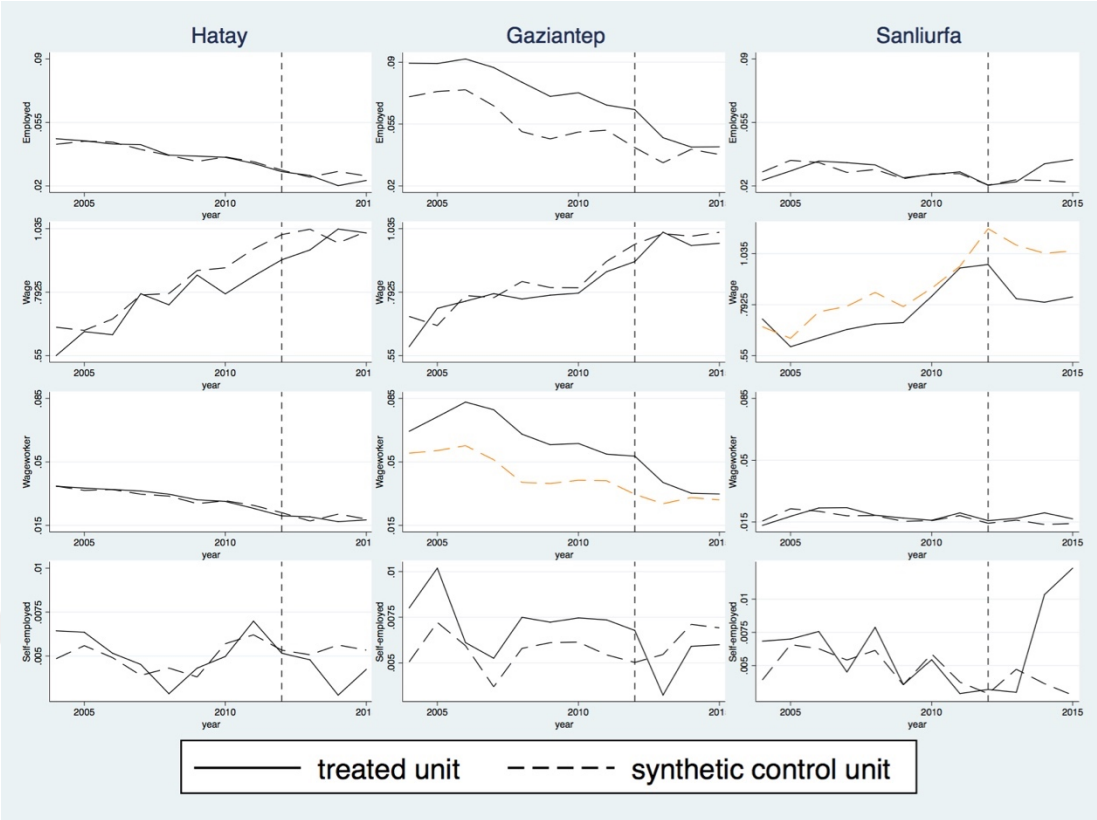

Fig. D12 Informal manufacturing sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Istanbul, 39.7%, Balikesir, 22.9%, Van, 15.9%, Konya, 13.3%, Manisa, 8.2%, Hatay, Wage: Van, 43.2%, Samsun, 28.8%, Kastamonu, 28.0%, Hatay, Wageworker: Istanbul, 38.8%, Konya, 29.5%, Balikesir, 26.5%, Van, 3.3%, Manisa, 1.9%, Hatay, Self-employed: Istanbul, 32.3%, Konya, 21.5%, Kirikkale, 14.9%, Balikesir, 13.6%, Van, 9.3%, Aydin, 5.4%, Izmir, 2.3%, Gaziantep, Employed: Istanbul, 100.0%, Gaziantep, Wage: Konya, 42.5%, Van, 40.3%, Agri, 17.2%, Gaziantep, Wageworker: Istanbul, 89.9%, Van, 10.1%, Gaziantep, Self-employed: Konya, 99.5%, Sanliurfa, Employed: Van, 42.3%, Malatya, 41.2%, Istanbul, 16.5%, Sanliurfa, Wage: Van, 88.7%, Ankara, 11.3%, Sanliurfa, Wageworker: Malatya, 60.8%, Van, 22.1%, Istanbul, 7.1%, Aydin, 5.2%, Agri, 4.9%, Sanliurfa, Self-employed: Van, 72.4%, Aydin, 14.5%, Zonguldak, 13.1%.

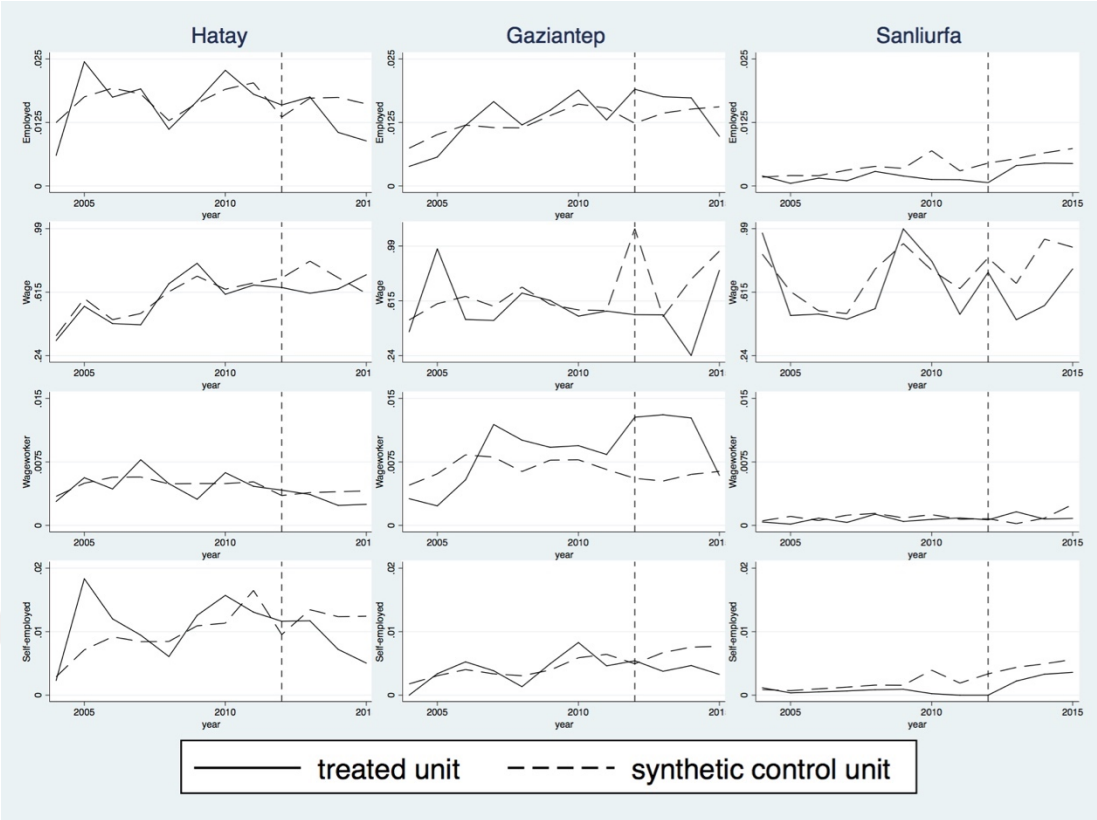

Fig. D13 Informal manufacturing sector employment and wages – women
Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Kocaeli, 53.6%, Van, 20.8%, Bursa, 17.4%, Trabzon, 5.2%, Kirikkale, 2.3%, Hatay, Wage: Kirikkale, 31.7%, Agri, 30.9%, Antalya, 15.0%, Istanbul, 9.6%, Bursa, 9.5%, Kayseri, 3.3%, Hatay, Wageworker: Trabzon, 29.7%, Kocaeli, 23.9%, Kirikkale, 22.8%, Van, 15.8%, Istanbul, 7.7%, Hatay, Self-employed: Kocaeli, 71.1%, Agri, 19.4%, Konya, 9.6%, Gaziantep, Employed: Van, 48.6%, Kocaeli, 27.6%, Istanbul, 15.5%, Konya, 8.4%, Gaziantep, Wage: Van, 35.6%, Kocaeli, 22.4%, Istanbul, 17.9%, Malatya, 14.1%, Kayseri, 9.9%, Gaziantep, Wageworker: Kocaeli, 58.9%, Van, 28.1%, Istanbul, 8.6%, Ankara, 4.3%, Gaziantep, Self-employed: Van, 36.2%, Istanbul, 28.0%, Kocaeli, 23.6%, Kirikkale, 7.1%, Ankara, 3.8%, Konya, 1.3%, Sanliurfa, Employed: Van, 83.8%, Ankara, 16.2%, Sanliurfa, Wage: Kayseri, 47.3%, Kastamonu, 33.3%, Kirikkale, 18.6%, Sanliurfa, Wageworker: Van, 88.2%, Ankara, 11.8%, Sanliurfa, Self-employed: Van, 71.5%, Istanbul, 28.5%.

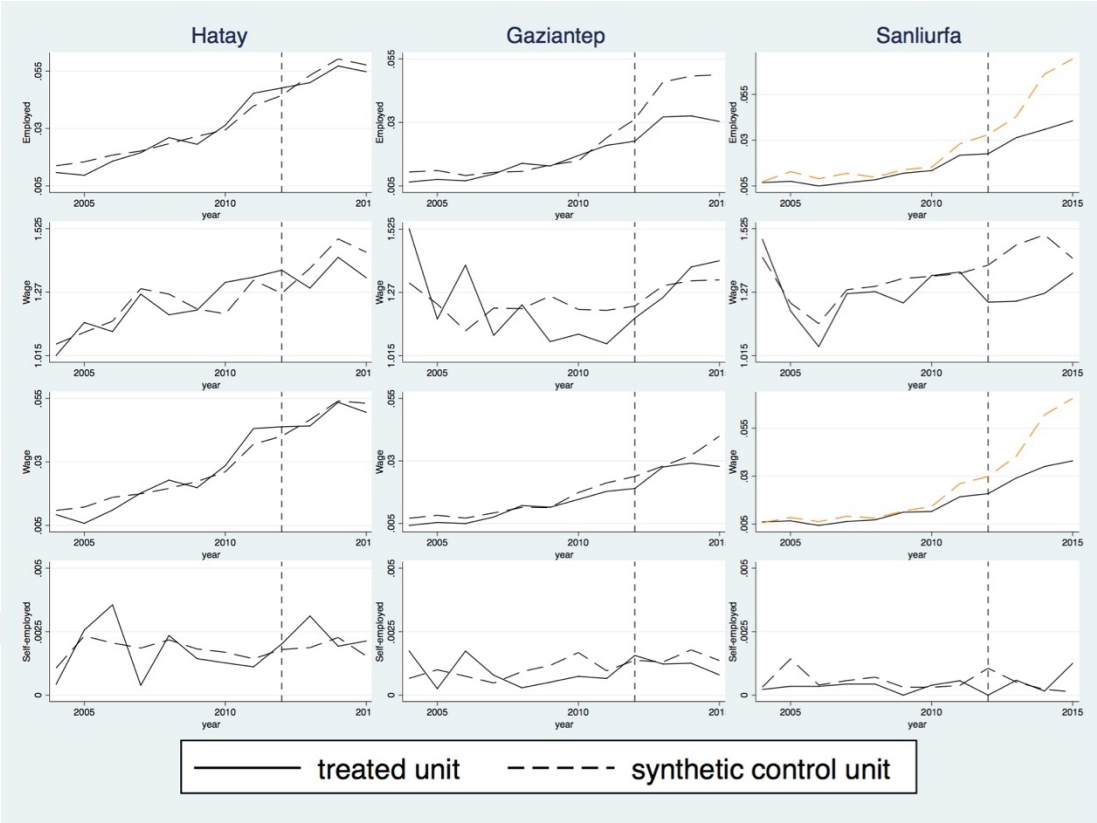

Fig. D14 Formal construction sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Samsun, 39.7%, Istanbul, 22.8%, Kocaeli, 20.9%, Van, 12.8%, Trabzon, 3.8%, Hatay, Wage: Kirikkale, 75.2%, Kocaeli, 15.3%, Malatya, 4.9%, Manisa, 4.6%, Hatay, Wageworker: Trabzon, 27.6%, Samsun, 25.5%, Kocaeli, 20.2%, Istanbul, 16.0%, Van, 10.7%, Hatay, Self-employed: Van, 35.4%, Istanbul, 21.1%, Balikesir, 18.9%, Bursa, 17.0%, Kocaeli, 7.7%, Gaziantep, Employed: Agri, 70.0%, Istanbul, 17.0%, Manisa, 13.0%, Gaziantep, Wage: Konya, 90.3%, Van, 9.7%, Gaziantep, Wageworker: Tekirdag, 67.2%, Agri, 19.4%, Bursa, 7.8%, Istanbul, 5.7%, Gaziantep, Self-employed: Van, 47.8%, Bursa, 47.1%, Kocaeli, 5.1%, Sanliurfa, Employed: Van, 94.3%, Istanbul, 5.7%, Sanliurfa, Wage: Samsun, 53.0%, Kayseri, 33.8%, Agri, 13.2%, Sanliurfa, Wageworker: Van, 89.2%, Istanbul, 10.8%, Sanliurfa, Self-employed: Van, 95.9%, Istanbul, 4.1%.

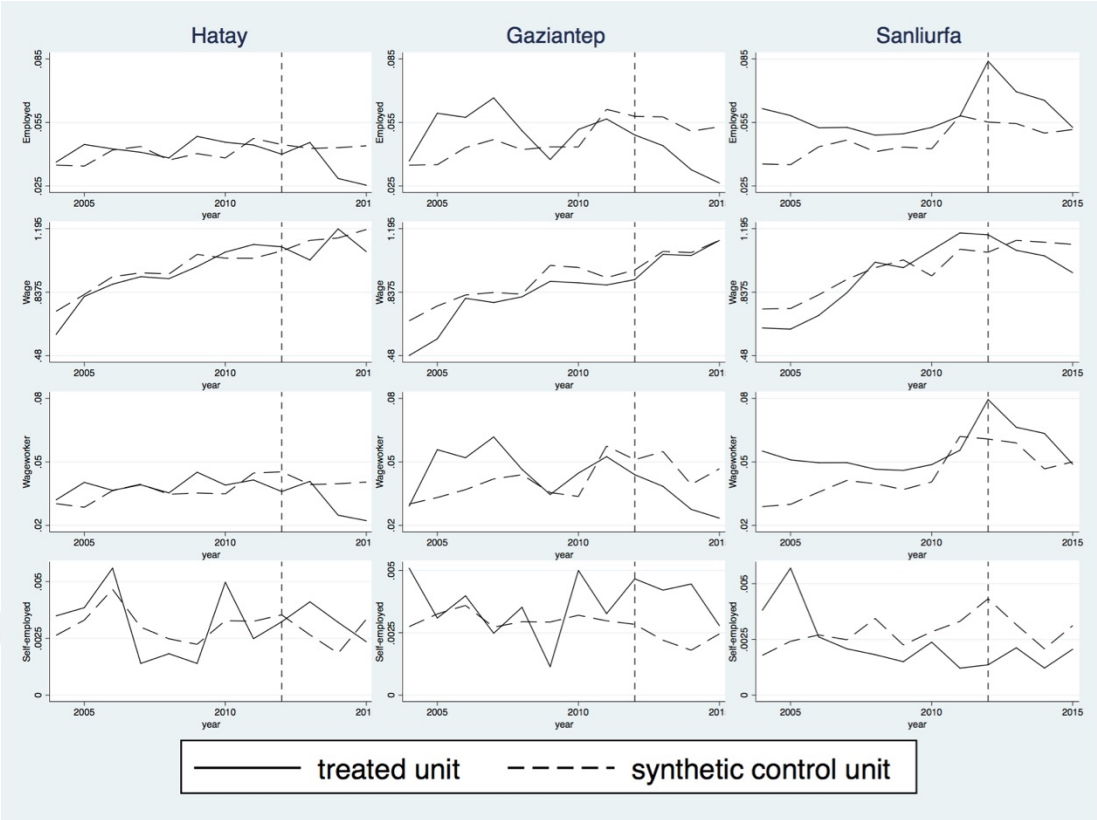

Fig. D15 Informal construction sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Trabzon, 64.4%, Van, 19.1%, Istanbul, 15.6%, Hatay, Wage: Konya, 63.9%, Van, 19.2%, Bursa, 15.4%, Hatay, Wageworker: Trabzon, 77.3%, Van, 22.7%, Hatay, Self-employed: Manisa, 64.1%, Ankara, 31.2%, Bursa, 4.8%, Gaziantep, Employed: Trabzon, 64.0%, Van, 36.0%, Gaziantep, Wage: Konya, 100.0%, Gaziantep, Wageworker: Samsun, 61.0%, Van, 39.0%, Gaziantep, Self-employed: Manisa, 57.1%, Bursa, 22.6%, Van, 11.5%, Istanbul, 8.8%, Sanliurfa, Employed: Trabzon, 68.4%, Van, 31.6%, Sanliurfa, Wage: Kirikkale, 66.1%, Konya, 30.2%, Van, 3.7%, Sanliurfa, Wageworker: Trabzon, 53.2%, Van, 46.8%, Sanliurfa, Self-employed: Van, 36.3%, Erzurum, 30.9%, Ankara, 28.8%, Konya, 4.0%.

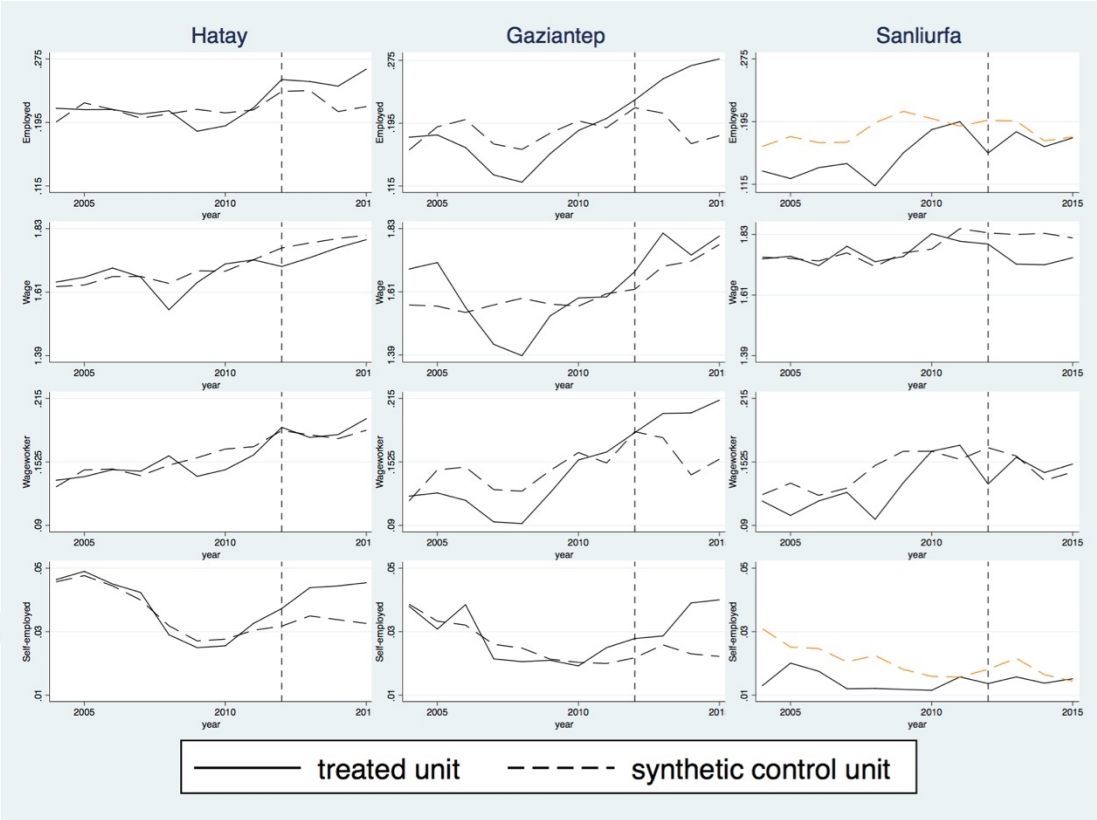

Fig. D16 Formal services sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Van, 54.0%, Tekirdag, 38.2%, Zonguldak, 4.6%, Manisa, 3.1%, Hatay, Wage: Balikesir, 34.3%, Van, 28.2%, Aydin, 23.7%, Istanbul, 12.3%, Manisa, 1.5%, Hatay, Wageworker: Van, 42.8%, Manisa, 28.8%, Agri, 16.1%, Tekirdag, 12.3%, Hatay, Self-employed: Istanbul, 29.5%, Izmir, 19.8%, Konya, 18.7%, Agri, 17.9%, Van, 7.6%, Manisa, 3.8%, Balikesir, 2.7%, Gaziantep, Employed: Agri, 60.6%, Van, 39.4%, Gaziantep, Wage: Aydin, 91.8%, Van, 8.2%, Gaziantep, Wageworker: Agri, 67.0%, Van, 33.0%, Gaziantep, Self-employed: Van, 63.0%, Izmir, 30.1%, Istanbul, 6.8%, Sanliurfa, Employed: Van, 95.9%, Istanbul, 3.8%, Sanliurfa, Wage: Van, 38.3%, Malatya, 31.5%, Istanbul, 27.0%, Ankara, 3.2%, Sanliurfa, Wageworker: Van, 99.7%, Sanliurfa, Self-employed: Van, 82.8%, Ankara, 14.2%, Istanbul, 3.0%.

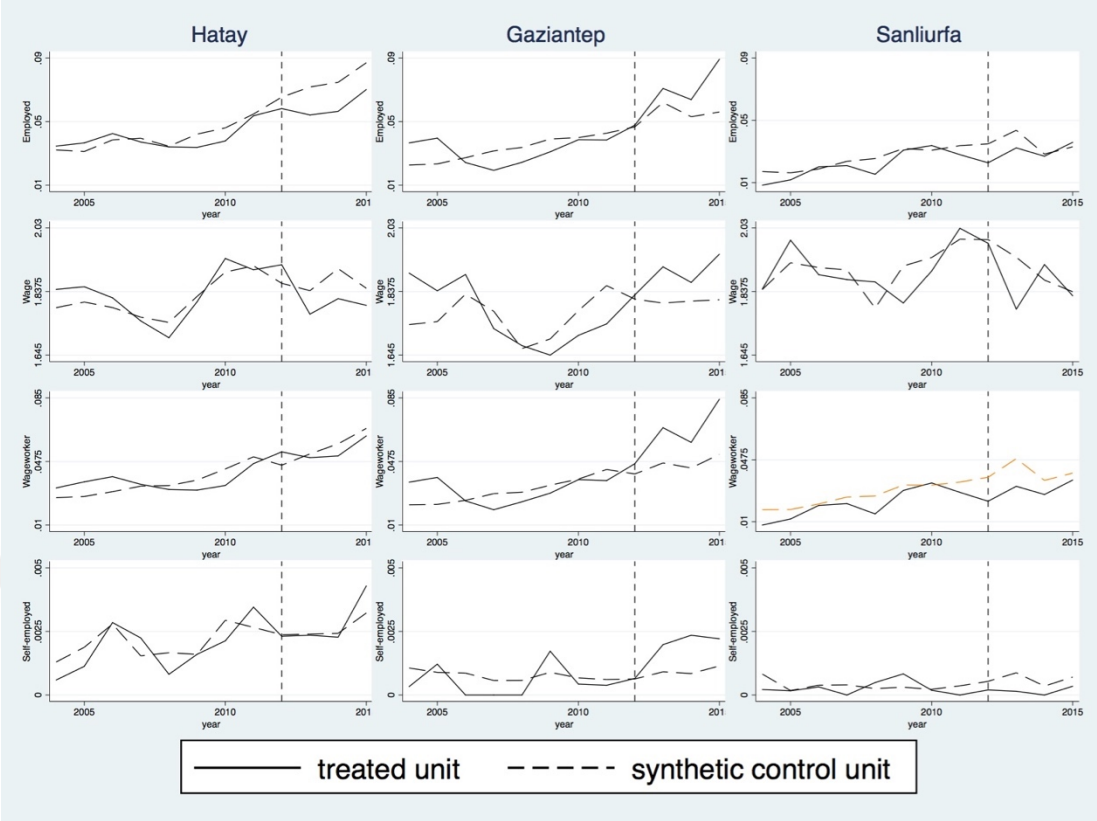

Fig. D17 Formal services sector employment and wages – women

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Malatya, 57.1%, Agri, 27.3%, Kayseri, 9.4%, Trabzon, 6.2%, Hatay, Wage: Malatya, 47.3%, Trabzon, 22.4%, Istanbul, 19.0%, Van, 7.7%, Antalya, 2.1%, Kirikkale, 1.6%, Hatay, Wageworker: Manisa, 60.5%, Van, 39.5%, Hatay, Self-employed: Antalya, 32.6%, Van, 27.4%, Bursa, 14.2%, Manisa, 12.0%, Kirikkale, 10.2%, Malatya, 3.3%, Gaziantep, Employed: Van, 63.2%, Kayseri, 28.0%, Kocaeli, 8.8%, Gaziantep, Wage: Trabzon, 60.4%, Antalya, 19.8%, Van, 16.2%, Aydin, 3.7%, Gaziantep, Wageworker: Van, 62.8%, Manisa, 37.2%, Gaziantep, Self-employed: Konya, 38.7%, Van, 38.4%, Agri, 22.2%, Sanliurfa, Employed: Van, 92.8%, Kayseri, 6.7%, Sanliurfa, Wage: Van, 59.6%, Antalya, 23.9%, Istanbul, 15.2%, Aydin, 1.3%, Sanliurfa, Wageworker: Van, 80.5%, Kayseri, 19.5%, Sanliurfa, Self-employed: Van, 95.1%, Balikesir, 3.3%, Tekirdag, 1.6%.

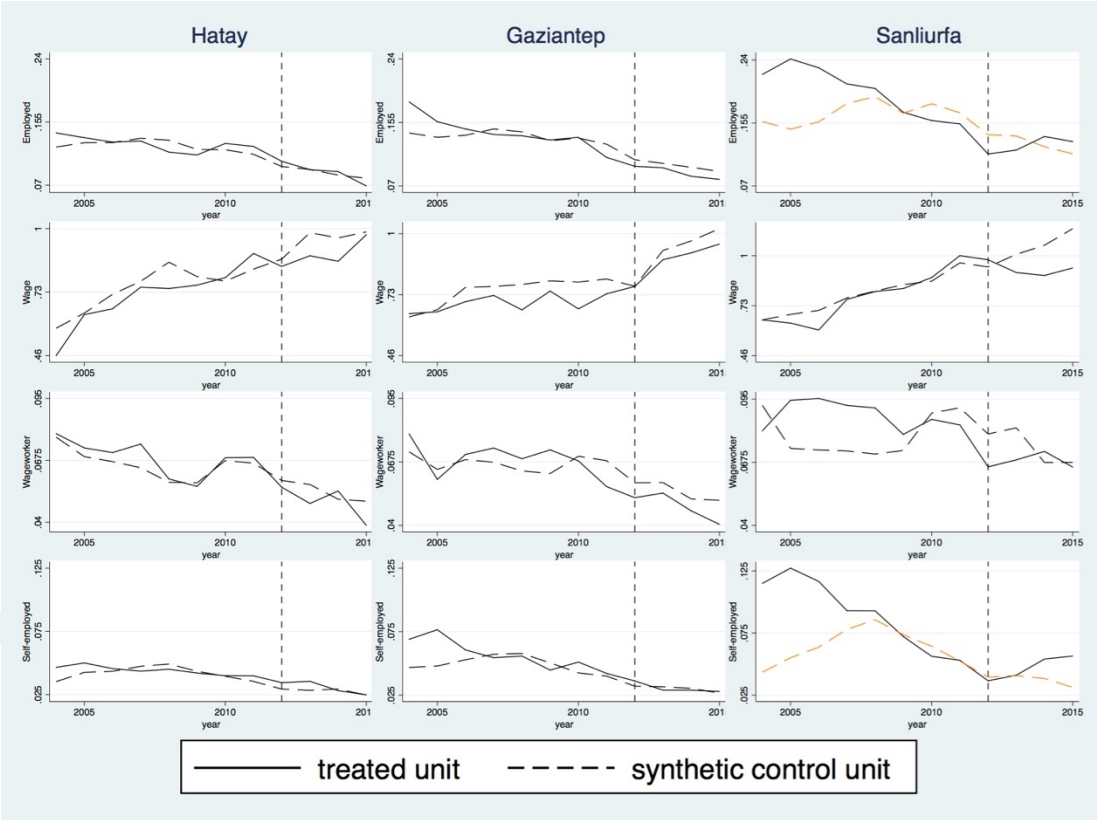

Fig. D18 Informal services sector employment and wages – men

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Van, 36.3%, Istanbul, 17.6%, Zonguldak, 15.3%, Kocaeli, 9.8%, Aydin, 8.6%, Bursa, 6.2%, Tekirdag, 4.7%, Samsun, 1.5%, Hatay, Wage: Kirikkale, 61.1%, Konya, 38.9%, Hatay, Wageworker: Van, 37.6%, Istanbul, 26.3%, Samsun, 18.1%, Izmir, 9.6%, Tekirdag, 5.4%, Bursa, 1.9%, Aydin, 1.1%, Hatay, Self-employed: Van, 32.0%, Istanbul, 26.4%, Kocaeli, 22.7%, Balikesir, 18.9%, Gaziantep, Employed: Istanbul, 50.5%, Van, 49.5%, Gaziantep, Wage: Konya, 52.4%, Agri, 47.6%, Gaziantep, Wageworker: Van, 37.7%, Konya, 32.7%, Tekirdag, 29.5%, Gaziantep, Self-employed: Agri, 36.9%, Van, 26.9%, Bursa, 26.3%, Istanbul, 10.0%, Sanliurfa, Employed: Van, 92.3%, Istanbul, 7.7%, Sanliurfa, Wage: Manisa, 45.0%, Malatya, 34.9%, Kirikkale, 20.1%, Sanliurfa, Wageworker: Van, 76.6%, Tekirdag, 17.4%, Agri, 6.0%, Sanliurfa, Self-employed: Van, 96.6%, Istanbul, 3.4%.

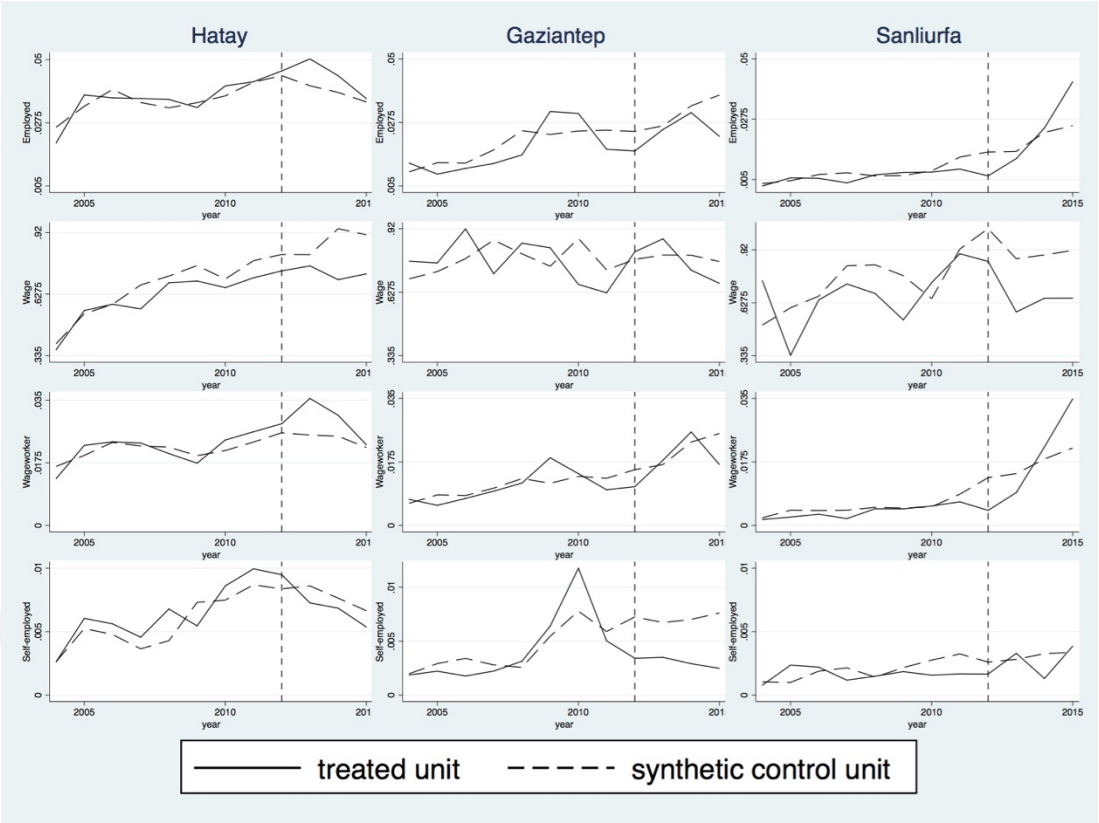

Fig. D19 Informal services sector employment and wages – women

Each figure shows the trajectory of the outcome variable for one treated region (solid line) and its synthetic counterpart (dashed line). The vertical dashed line is year 2012, which is the treatment year. The regions with positive weight in the synthetic control are as follows; Hatay, Employed: Zonguldak, 31.4%, Antalya, 26.9%, Kocaeli, 24.0%, Kirikkale, 17.6%, Hatay, Wage: Trabzon, 59.5%, Van, 21.2%, Agri, 19.3%, Hatay, Wageworker: Kocaeli, 28.9%, Zonguldak, 28.5%, Antalya, 24.4%, Kirikkale, 18.2%, Hatay, Self-employed: Kocaeli, 52.4%, Zonguldak, 25.8%, Antalya, 21.8%, Gaziantep, Employed: Konya, 62.0%, Van, 28.7%, Bursa, 9.2%, Gaziantep, Wage: Konya, 52.6%, Erzurum, 41.3%, Istanbul, 6.2%, Gaziantep, Wageworker: Konya, 47.8%, Van, 40.8%, Istanbul, 11.4%, Gaziantep, Self-employed: Istanbul, 41.5%, Agri, 37.4%, Kirikkale, 13.3%, Ankara, 7.8%, Sanliurfa, Employed: Van, 70.2%, Agri, 29.8%, Sanliurfa, Wage: Van, 44.8%, Kocaeli, 28.8%, Kayseri, 26.3%, Sanliurfa, Wageworker: Van, 95.4%, Istanbul, 4.6%, Sanliurfa, Self-employed: Van, 37.9%, Agri, 32.5%, Manisa, 19.4%, Ankara, 10.2.

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