Balkan, Binnur; Tok, Elif Ozcan; Torun, Huzeyfe; Tumen, Semih

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Binnur Balkan
Elif Ozcan Tok
Huzeyfe Torun
Semih Tumen

I Z A Institute
of Labor Economics

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Binnur Balkan
Stockholm School of Economics

Elif Ozcan Tok
Central Bank of the Republic of Turkey

Huzeyfe Torun
Central Bank of the Republic of Turkey

Semih Tumen
TED University and IZA

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ABSTRACT

Immigration, Housing Rents, and Residential Segregation: Evidence from Syrian Refugees in Turkey*

The massive inflow of Syrian refugees is argued to drastically affect various social and economic outcomes in the hosting countries and regions. In this paper, we use micro-level data to investigate whether the Syrian refugee inflows have affected the market for housing rentals in Turkey. The unexpected arrival of a large number of refugees due to civil conflict in Syria is used to construct a quasi-experimental design. Since the construction of new housing units takes a long time, refugee inflow resembles a positive demand shock to the sector. We find that the refugee inflows have led to an increase in the rents of higher-quality housing units, while there is no statistically significant effect in the rents of lower-quality units. This finding supports a residential segregation story, which suggests that the refugee wave has increased the demand for native-dominant neighborhoods with better amenities especially among natives. We argue that negative attitudes towards refugees – potentially due to refugee-native conflict along several dimensions – may be generating this result.

Corresponding author:
Semih Tumen
Department of Economics
TED University
Ziya Gokalp Cad. No:48
06420 Kolej, Ankara
Turkey
E-mail: semihtumen@gmail.com

1 Introduction

Massive refugee movements are subject to an ongoing debate related to their impact on key economic variables in host countries—including economic growth, employment, wages, size of the informal economy, consumer prices, public finance, education, firm openings, crime, health, etc. There is a growing academic literature on the impact of refugees on various host-country outcomes. Although challenges and complaints generally attract more attention than opportunities, there is no clear consensus on whether the economic costs of refugees exceed their benefits or not. Additional research effort is needed to uncover various aspects of this economic cost-benefit accounting.

In this paper, we delve into a rather unexplored area: the short-term impact of refugees on the housing market—in particular, housing rents—and residential structure in cities. Refugee inflows, especially in the early stages of the process, are expected to affect the rental market as most of the refugees residing outside of the camps primarily seek affordable rental accommodation rather than home ownership. Our goal is to present some new evidence from Syrian refugees in Turkey. Based on official figures as of May 2018, Turkey hosts around 3.6 million Syrian refugees.[1] The influx started in January 2012 and a very large number of (close to 2 million) refugees had crossed the border by the end of 2014.[2] Until 2014, refugees were clustered around the provinces on the Turkey-Syria border waiting for an early resolution of the conflict and hoping to go back home. It later became clear that early resolution was not a possibility. After that point (around mid-2014), a second wave of movement started: refugees sought permanent homes both within and outside of Turkey [Tumen (2016)].

The first wave of movement—i.e., from January 2012 to mid-2014—offers a quasi-experimental setup, because refugees were exogenously clustered around some provinces, while there were visibly no refugees in the rest of the country. As a result, there are clearly-defined treatment and control regions observed before and after the influx, which allow us to construct

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[1]For detailed statistics and figures, see https://data2.unhcr.org/en/situations/syria.
[2]Turkish population was around 78 million in 2014 and the current population is slightly above 80 million. So, the refugee to population ratios are not huge. However, refugees were clustered near the Syrian border until 2014. So, the refugee to population ratios were particularly high in these regions. In Kilis, for example, the ratio was close to 50 percent. See Table (1).

a simple and intuitive difference-in-differences setup for the purpose of estimating the impact of refugees on housing rents in the hosting regions.[3] We use the Survey of Income and Living Conditions (SILC) micro-level data sets for the 2010–2013 period in our estimations. The SILC data offer a rich set of housing information along with detailed individual- and household-level characteristics. We find that, on aggregate, housing rents increased in the order of 2-5 percent—depending on empirical specification—in the hosting regions after the influx.

Interestingly, we document that the increase in rents comes almost entirely from high-rent (or high-quality) units. The refugee influx increased the demand for neighborhoods with higher-quality amenities especially among natives, which is in line with a residential segregation story. One implication of this result is that refugee settlement likely discomforts natives, which can be interpreted as negative attitudes towards refugees. The auxiliary regressions we perform suggest that crime did not significantly increase in refugee-receiving neighborhoods. So, the observed segregation in the short-run is likely due to natives' subjective evaluations and also their perception of decreased economic/social opportunities, which support the hypothesis of negative attitudes towards refugees. Due to increased refugee concentration in low-rent neighborhoods, natives may be feeling discomfort along several dimensions including decreased labor market opportunities, congested public services (such as health, education, entertainment, transportation), and increased psychological distress.

Focusing on the housing market effects of refugee movements is useful as a complementary effort in understanding the economic effects of refugees on host economies for three main reasons. First, a vast majority of the papers in the related literature focus solely on labor market consequences of refugees. Investigating the housing market effects of refugee inflows is key to understanding the formation and characteristics of refugee/immigrant social networks, as they have important labor market and poverty implications both in the short- and long-term.[4] Second, a massive refugee inflow can significantly affect urban economic structure

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[3]The second wave of movement within Turkey (from mid-2014 on) falls out of the scope of this paper as refugees self-selected into their preferred regions and, thus, the analysis of this second wave requires the use of different empirical methods along with micro data on refugees, which is not publicly available yet.

[4]Formation of immigrant/refugee social networks is a means to raise job finding probabilities among refugees. But, if those

in terms of both residential amenities and industrial performance. Finally, hosting a large refugee population in a city implies a more congested use of local public goods, which has longer-term implications for local public finance, local taxes, and local prices. Our paper focuses on both the quantitative impact of refugee inflows on housing rents and the potential underlying mechanisms in the housing market. This will be a first step towards understanding the housing market effects of Syrian refugees on hosting economies.

The plan of the paper is as follows. Section 2 reviews the related literature. Section 3 provides a brief description of the data and institutional details including an overview of the Syrian-refugee settlement in Turkey. Section 4 presents a simple theoretical framework and explains the main hypothesis. Section 5 describes our empirical strategy putting specific emphasis on econometric identification and discusses the results. Section 6 concludes.

2   Related Literature

There is a growing literature investigating the economic impact of refugees on host countries.[5] However, the literature focusing on housing market effects is rather slim. One observation is that the existing literature does not clearly distinguish between the housing market effects of refugees versus immigrants. In this section, we start with a review of the general evidence on the housing market response to increased demand for housing due to either refugee or immigrant flows. Then, we present a brief overview of the literature on the impact of ethnic segregation on housing markets. Finally, we compare our findings with the findings reported in those literatures and explain how our paper can be placed into the broader literature on the economic impact of refugees on host-country outcomes. We also discuss the potential differences between refugee versus immigrant effects on housing markets.

Refugee/immigrant inflow in a specific country, city, or region resembles a positive housing demand shock and, as a result, housing rents/values are expected to increase. The related

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social networks lead to segregated neighborhoods with low average human capital, then this may have negative long-term conse-quences in terms of human capital formation, occupational distribution, inequality, and labor market productivity.

[5]For some background reading on the economic consequences of refugee movements, see Maystadt and Verwimp (2014), Tumen (2015), Hatton (2016), and Dustmann, Fasani, Frattini, Minale, and Schonberg (2017).

literature sets two goals: (1) directly testing this hypothesis and (2) understanding the main mechanism through which this demand shock affects housing market. Saiz (2003) examines the impact of Mariel boatlift on housing rents in Miami and finds that rents increased significantly for the units of low quality, while the units of higher quality were not affected. Low-skill immigrants generated a disproportionate demand for low-quality housing, which resulted in different responses from different segments of housing along the quality spectrum.[6] Saiz (2007) implements an instrumental variable strategy and shows that immigration flows increase housing rents/values in American cities due to inelastic housing supply. Ottaviano and Peri (2006), Mussa, Nwaogu, and Pozo (2017), and Gonzalez and Ortega (2013) report similar results.[7] Akbari and Aydede (2012) find a smaller positive impact for Canada perhaps due to outflow of natives from the recipient areas. However, as Saiz and Wachter (2011) argue, if there is segregation in a metro area based on immigration status, growing density of immigrants in a neighborhood may be associated with a lower rate of growth in housing value. One potential explanation is that natives pay a premium to live in neighborhoods with native predominance. Sá (2015) also reports using UK data that low-skill immigration reduces house prices in hosting regions due to mobility response of high-skill natives.[8] Accetturo, Manaresi, Mocetti, and Olivieri (2014) document a similar result using Italian data. So, the findings are mixed and depend on country-specific context.[9]

The existing literature provides three main pieces of evidence. First, immigrant/refugee inflows increase housing prices—rents and value—due to inelastic housing supply in the short run. Second, a sudden refugee/immigrant influx, as in the Mariel boatlift case, leads to an increase in housing rents mostly in low-quality residential areas—potentially because of high housing demand among refugees due to predominance of residents of similar origin. Third, when there is segregation, increasing the density of immigrants generates a slower appreciation and even depreciation in housing value. The second and third findings seem to contradict each other.

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[6]See, e.g., Sweeney (1974), Braid (1981), and O'Flaherty (1996) for additional information on quality segmentation in the housing market.

[7]See also Eliasson (2017).

[8]See Braakmann (2016) for a similar finding.

[9]In a recent paper, Depetris-Chauvin and Santos (2018) study the impact of internally displaced people on housing rents in Columbia. They find that rents in low-quality dwellings increase and high-quality ones decrease as response to increased IDPs. Internal displacement is likely associated with very different mechanisms than refugees/immigrants could generate.

In any case, additional effort is needed to understand how different housing market segments respond refugee/immigrant flows and what the underlying mechanisms are.

Our findings are in line with the third explanation, i.e., housing rents decline as refugee density sharply goes up in a certain region or neighborhood. We argue that natives seek native-predominant neighborhoods as a response to increased refugee density. Segregation is the natural outcome. One interesting implication of this result is that natives are likely responding to refugee settlement directly, which can be interpreted as negative attitudes toward refugees/immigrants. There are three potential explanations for these negative attitudes. First, refugees/immigrants may be replacing natives in the local labor market. Second, natives may be getting a direct disutility from living in a neighborhood with high refugee/immigrant density. Finally, the influx may be generating an increase in crime rates in the neighborhood. We also argue that the pre-existence of immigrants in the hosting areas also shape the response of housing rents to refugee/immigrant influx. Before the influx, there was virtually no refugees in the affected regions in Turkey.[10] Low-skill and poor immigrants had no choice but settling in low-quality and immigrant-dominant neighborhoods. This triggered the movement of natives residing in these regions toward the high-quality neighborhoods, which typically attract much less demand from refugees—at least in the short term. It wouldn't be wrong to argue that wealthy refugees might have settled in high-quality neighborhoods too. But, they are much less in number and can adapt to a different culture more swiftly.

Our paper is also related to the literature investigating the impact of ethnic segregation on housing markets. Both empirical and theoretical predictions in this multidisciplinary literature suggest that ethnic segregation drives housing prices/rents down in minority-dominant neighborhoods.[11] Ottaviano and Peri (2006) argue that diversity, as opposed to segregation, drives housing rents up due to increased quality of amenities and human capital in the neighborhood. This suggests that if immigrant flows increase diversity and heterogeneity in a neighborhood, then this positively affects amenities and drives prices up in the neighborhood. Extreme forms

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[10]For example, Saiz (2003) argues that Cuban (and other Spanish-speaker) immigrants pre-existed in Miami before Mariel boatlift.

[11]See, for example, Harris (1999), Tumen (2012), and Li (2014).

of segregation harm the quality of amenities in low-quality neighborhoods.[12] The qualitative nature of our results is consistent with the findings documented in this literature.

There is a broad literature on the impact refugee flows on the hosting economies[13] and a rather small but quickly growing literature on Syrian refugees. Recent influx of Syrian refugees to Turkey allows researchers to construct quasi-experimental designs for the purpose of estimating the impact of immigration on natives' outcomes. Del Carpio and Wagner (2015) and Ceritoglu, Gurcihan Yunculer, Torun, and Tumen (2017) focus on labor market outcomes, Balkan and Tumen (2016) study the impact on consumer prices, Altindag and Kaushal (2017) concentrate on voting behavior, Akgunduz, Hassink, and Van den Berg (2018) and Altindag, Bakis, and Rozo (2018) investigate the impact on firm openings and economic performance, and Akgunduz, van den Berg, and Hassink (2015) explore the impact on a broader set of outcomes using aggregate data. Our paper is the first one in the literature studying the impact of the Syrian refugee influx on housing markets with micro data.

It is important to note that, among the papers and literatures reviewed above, some of them focus on refugees (i.e., forced migration) and others focus on immigrants. Given the conceptual and definitional differences between refugees and immigrants, their impact on host community outcomes may also be different and the results may even be incomparable. However, once the underlying mechanisms and the theoretical framework are understood well, those differences will become easier to detect and interpret. In Section 4, we provide the details of the theoretical framework and the related hypothesis we have in mind.

3   Data and Institutional Details

In this section, we first lay out the details of Syrian refugee settlement in Turkey. In doing so, we also explain why the refugee resettlement decision is exogenous to the housing conditions in our period of analysis. Then, we describe the Survey of Income and Living Conditions (SILC) data set and provide some descriptive statistics.

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[12]See Alesina and La Ferrara (2005) for a detailed review of the broad literature on ethnic diversity.
[13]See, for example, Card (1990), Hunt (1992), Friedberg (2001), Cohen-Goldner and Paserman (2011), Zimmermann (2016), and Borjas and Monras (2017) for a broad discussion of refugee movements and their impact on natives' outcomes.

3.1 Syrian Refugees in Turkey

Following the outbreak of civil conflict in Syria, Turkey implemented an open-door policy to Syrian refugees. As a consequence, a huge number of refugees fled from Northern Syria to Southeastern Turkey in search of security and protection. The number of refugees substantially increased over time and reached approximately 3.2 million by the second half of 2017. Figure (1) depicts the exponential increase in the number of refugees in Turkey. From the figure, it is also clear that there was no Syrian population presence in Turkey prior to 2012.[14] The biggest jumps are observed in 2014 and 2015.

Stock of registered Syrian refugees in Turkey
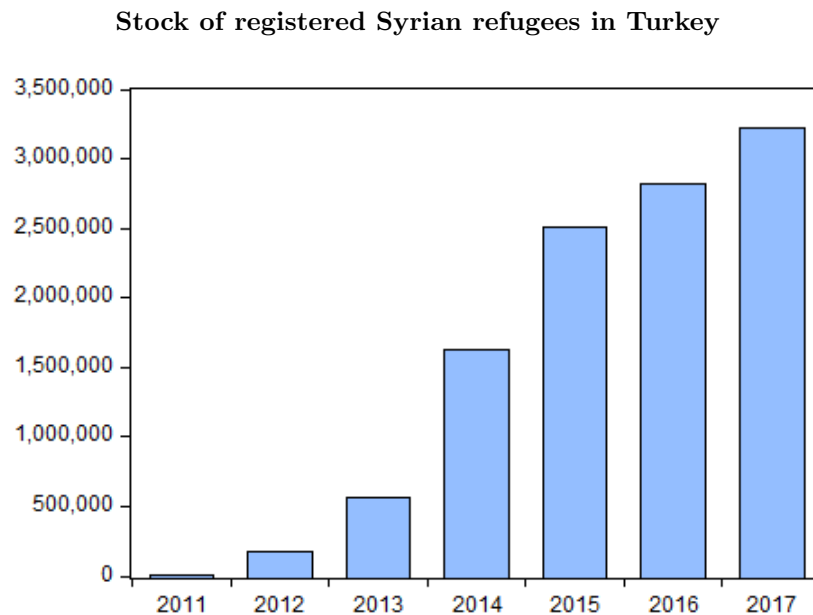
Figure 1: Aggregate numbers refer to UN Refugee Agency figures as of October 2017.

At the end of 2011, Turkey started constructing refugee camps in order to provide accommodation, food, health facilities, and other social services to Syrian refugees. Although the number of these camps increased over time, the capacity was not fully adequate to accommodate all refugees. 22 camps were built in Adana, Adiyaman, Gaziantep, Hatay, Kahramanmaras, Kilis, Malatya, Mardin, Osmaniye, and Sanliurfa, which are all very close to the Syrian-Turkish border. As of October 2017, only 7.1 percent of Syrian refugees stay in these camps. However, the

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[14]It is often asserted in the popular media that there is also a significant number of unregistered refugees in the hosting regions, which are not captured by the official UN figures. Note that there was also no non-refugee Syrian immigrants residing in the region before the crisis.

majority of those living out of camps prefer to settle in the areas close to the camps to have an easy access to benefits provided by the Turkish government in and around the camps such as health and education services. The period of analysis in this paper is 2012–2013, and the refugee density in the areas with camps was above 90 percent within this period. Therefore, it is reasonable to assume that relocation decision of Syrian refugees are exogenous to the economic conditions, which includes but not limited to housing rents. Moreover, for the first couple of years after the start of the Syrian civil war, Syrians prefer to settle mostly in border cities to quickly travel back to Syria if an opportunity presents. Due to above reasons, high influx of Syrian refugees caused a significant increase in the population of Southeastern cities. Table 1 demonstrates the number and the ratio of refugees across cities where the refugees are heavily concentrated. Coupled with a prominent difference among cities, the refugee to native ratio goes as high as 98 percent in Kilis and as low as 3 percent in Malatya. After 2014, refugees started self-selecting into the regions of their preference. Therefore, the quasi-experimental setup may be less relevant after this date. Moreover, the tendency of internal migration was non-existent during 2012 and 2013 [see Balkan and Tumen (2016)], so the potential change in housing rents due to migration natives to regions with no refugee population is also avoided in our analysis.

Accommodation is an important concern for the refugees who are not staying at refugee camps, mainly because there is already a shortage of accommodation in refugee-receiving cities and supply of housing cannot increase in the short-term. According to the 2016 wave of SILC conducted by the Turkish Statistical Institute (TURKSTAT), the rate of homeownership is 63.5 percent on average in refugee receiving cities. In short, shortage in housing supply combined with the increased demand for rental units induced by the refugee influx puts a pressure on housing rents in Southeastern Anatolia. Since 2011, the housing rents have increased by 20.6 percent in refugee hosting region compares to 11.7 percent in the remaining regions (excluding the Mediterranean region). Further, as out-camp Syrian refugees have a tendency to live in neighborhoods with lower rents due to budget constraints, they might have crowded-out natives residing in low-quality neighborhoods.

3.2 Data

For empirical analysis, we use the 2010–2013 waves of the Survey of Income and Living Conditions (SILC)—conducted annually by TURKSTAT since 2006. It includes detailed information on income, poverty, education, health, housing, and social exclusion. The cross sectional data set from the SILC is representative at NUTS-1 level, which corresponds to 12 geographical regions. The design of the survey is rotational in which one-fourth of the sample is replaced every year. Each individual is monitored for four consecutive years. The survey is carried out once a year in May and June.

We employ cross-sectional micro-level data for the period 2010-2013 covering the pre-immigration periods (2010 and 2011) and post-immigration periods (2012 and 2013). The NUTS1-level regional categorization divides Turkey into 12 regions. Among those regions, Southeast Anatolia is the one with the highest refugee concentration. Southeast Anatolia is followed by the Mediterranean region in refugee concentration. However, the prevalence of refugees are much more limited in the Mediterranean region compared to Southeast Anatolia. We assign Southeast Anatolia as the treatment group and all other regions except Mediterranean as the control group in our main empirical specification. We exploit the housing questions in the data set together with the characteristics of the household head. 12,106 households are surveyed in 2010; 15,025 in 2011; 17,562 in 2012; and, finally, 19,899 in 2013. Table (2) summarizes the descriptive statistics in pre-treatment and post-treatment periods for treatment and control regions, separately. From Table (2), we can observe that the average rent has increased by 12.6 percent in treatment area, while that in the control area has increased by only 10.4 percent from pre-refugee to post-refugee period. However, the average rent in the treatment region is still significantly lower than that in the control area due to differences in dwelling quality and the characteristics of the housing market. For example, the number of rooms in the control region is 0.3–0.4 unit higher in the control region compared to that in the treatment region. The units with basic amenities such as kitchen, indoor toilet, or hot water system are also more common in the control region compared to the treatment region.

Finally, to visualize the effects of Syrian refugees on housing and perceived crime, Figure (2) plots the pre-immigration and post-immigration trends for housing rents, log of perceived rent, below-median housing rents, above-median housing rents, and crime in the treatment versus control areas. The average actual rent and perceived rent record a steeper increase in the treatment area (Southeastern Anatolia) relative to the control area after 2012—i.e., the start of the influx. Additionally, the mean of below-median housing rents moves quite smoothly in the treatment region, while the mean of above-median housing rents increases about 15 percent. This result supports the idea that natives tend to move into more expensive neighborhoods following the refugee influx. The change in crime or violence is rather ambiguous in the graphs, since there is an increase in 2012 but a decrease in 2013. However, the level of "perceived violence" in 2013 is higher than that in 2011 in the treatment region, while it is roughly the same in the control region in the same periods.

4   Theoretical Framework

Forced migration generates a housing demand shock. Given that housing supply cannot respond in the short-term, increased demand is expected to generate an increase in housing prices—rents and/or value. Empirical evidence, however, suggests mixed results. In this section, we describe the context representing the Syrian refugee inflows to Turkey. Based on this context, we explain the main theoretical framework that may be operating in the background.

The average Syrian refugee in Turkey is younger and much less skilled than the average native residing in the hosting regions—Southeastern Turkey. This implies that refugees mostly seek low-cost and temporary accommodation; so, demand for low-cost rental units is expected to increase the most following the influx. The hosting regions do not have any pre-existing refugee/immigrant population. Moreover, the hosting regions have a much higher share of informal economy—and, therefore, much higher demand for low-wage/low-skill workers—than the rest of the country. As a result, there can be several conflict areas between natives and refugees. First, refugees may be replacing natives in the local labor markets for low-skill jobs,

especially in the informal sector. Second, refugees may be more likely to engage in criminal activities. Third, natives may be receiving direct disutility from living in a neighborhood with high density of low-skill refugees. Due to one or more of these factors, natives may want to move into neighborhoods with no or very low refugee density. Ottaviano and Peri (2006) argue that increased diversity may boost human capital in a certain region and generate demand for housing. However, in our case, the refugee population has very low human capital and this effect is unlikely to exist.

Given this contextual description, a sudden and large refugee inflow may initially increase demand for low-cost housing in the rental market. This sudden inflow may eventually lead natives to move toward neighborhoods with no or low refugee population; these are most likely high-quality/high-rent neighborhoods. One can even talk about a tipping story as Card, Mas, and Rothstein (2008) suggest, i.e., highly segregated neighborhoods may be formed if a certain threshold refugee ratio is exceeded. As natives move out and the average quality of amenities declines in low-cost neighborhoods, rents will either not change or decline. Increase in demand for high-quality neighborhoods, on the other hand, will generate a rise in housing rents.

This theoretical framework will depend on the pre-existence of refugees/immigrants in the hosting regions. If there already exists a high density of immigrants in low-cost residential areas (as in the Mariel boatlift example), then a sudden increase in demand for low-cost dwellings due to immigrant inflows will drive rents up in these neighborhoods. However, if there is no pre-existing refugee/immigrant population, then flee of natives from low-cost areas may put downward pressure on rents. Note that we hypothesize a short-term framework, in which housing supply cannot immediately respond. In the long-run, supply will increase in areas with excess demand for housing and prices will also adjust accordingly.

5   Empirical Strategy and Results

In this section, we describe the details of our identification strategy and present our empirical methodology followed by a thorough discussion of the results. We perform a difference-in-

differences (DID) estimation to identify effects of Syrian refugee inflows on the housing market in the hosting regions. In doing so, we consider the effects of refugee inflows on both actual and perceived rents as well as homeownership and perceived crime in the neighborhood.

We have two difference-in-differences specifications in our baseline setup. In the main specification, Southeast Anatolia is defined as the treatment area, while the control area includes all regions but Mediterranean. In the alternative specification, the treatment area also involves the Mediterranean region, while all the other regions are placed into the control area. However, as the refugee-to-population ratio is relatively low in the Mediterranean region, we prefer the first specification over the second one. In any case, we left the Mediterranean region outside of the control group to avoid capturing any possible effects of refugee presence in this region.

5.1 Identification Strategy

The main aim of this paper to estimate the impact of refugee inflows on housing rents. To this end, we exploit a quasi-experiment, which is generated by a sudden and unexpected inflow of Syrian refugees to Southern Turkey. The main advantage of quasi-experimental data over non-experimental data is that the former does not suffer from the possible selection problems.[15] In the immigration setting, there are two possible selection problems. The first one is the selection of individuals into immigration. This concern is not relevant to the case of Syrian refugees given they are forced to leave Syria from the closest border. The second selection problem is the relocation choice of immigrants within the destination country. In non-experimental data, economic conditions, specifically housing market conditions, can play an important role in immigrants' settlement and re-settlement decisions. On the contrary, Syrian refugees are settled in the Southeastern cities by the Turkish government. Hence, the forced movement of Syrian refugees offers a suitable set-up to study the causal effect of immigration on housing rents.

We use a difference-in-differences (DID) approach to estimate the impact of immigration on

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[15]See Tumen (2015) for details.

prices. In the DID set-up, there is a "treatment region" versus a "control region" and a "pre-immigration period" versus a "post-immigration period." Our data set does not allow us to observe city-level variation in housing rents. Instead, we have access to micro-level data at the NUTS1 level. We assign Southeast Anatolia to treatment region in the main specification. In the alternative specification, we also assign Mediterranean region into the treatment group. All other 9 regions are grouped under the control region.[16]

Since the refugee inflow started at the end of 2011 and there was no refugee presence before this date, we characterize 2010 and 2011 as the pre-immigration period. Accordingly, 2012 and 2013 are assigned to the post-immigration period. In order to represent the timing of the events, we create a dummy variable which takes the value of 1 in the post-immigration period and 0 in the pre-immigration period. We call this variable P. The treatment status is captured by a dummy variable T, which is 1 for Southeastern Anatolia and 0 for all other regions except Mediterranean. In the alternative specification, T takes the value of 1 for the Mediterranean region as well. This implies the following DID equation for housing rents:

$$\ln(\text{rent}_{r,y,i}) = \alpha + \beta(T_r * P_y) + f_r + f_y + \boldsymbol{X}_{r,y,i} + \varepsilon_{r,y,i}, \tag{5.1}$$

where r represents the region of observation, y stands for the year of observation, and i indexes households. In the DID regression, we control for year fixed effects (f_y) and region fixed effects (f_r) as well as the dwelling characteristic (the vector $\boldsymbol{X}$) such as size, number of rooms, and existence of kitchen. The summary statistics for the control variables can be found in Table (2). The parameter β gives the average impact of immigration on the housing rents in the treatment region in the post-immigration period.[17]

The regressions for perceived rents, homeownership, and perceived crime are also constructed as we outlay above. For perceived rents, the dependent variable is the log of perceived rent. In

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[16]As Table (1) indicates, there is a significant variation in refugee concentration among cities and we are forced to assign several cities with little or no refugee settlement into treatment region due to data limitations.

[17]See Tumen (2016), Balkan and Tumen (2016), and Ceritoglu, Gurcihan Yunculer, Torun, and Tumen (2017) for the details of a similar empirical setup. In order to understand the impact of refugee density on the outcomes of interest, it would be useful to exploit variation in refugee-to-population ratio within the treatment group. Unfortunately, the SILC data set allows for regional variation only at NUTS1 level, which means that we have to handle the refugee-receiving region as an indivisible block. Although this seems to be a drawback, we report in our companion work (in which we use data allowing for variation in refugee density within the treatment region) that accounting for such a variation does not change the results for a broad set of outcomes.

the homeownership regression, the dependent variable takes the value of 1 for homeowners and 0 otherwise. Finally, the perceived crime variable is 1 for the households who reports existence of crime or violence in their neighborhoods and 0 otherwise. Finally, all the regressions are weighted by the population weights reported in SILC. However, non-weighted estimates are not statistically different from the weighted ones and not reported in the paper for the sake of brevity.

Before we present our results, it will perhaps be useful to briefly discuss the differences between actual and perceived rent variables, which are our main dependent variables. In the data, actual rents are directly reported for the rental units. Changes in actual rents directly reflect the impact of refugee inflows on the rental market. There are also home owners in our data. The survey also asks the perceived (i.e., estimated) rents to the home owners residing in non-rental units. We believe that the perceived rent variable is also useful because it conveys information about the perceived effects of refugee inflows on the demand and supply conditions in the rental market. So, we use both variables in our analysis. Note also that, in our auxiliary analyses, we use "perceived crime" variable as our dependent variable. The survey asks the respondents whether their crime perceptions in the neighborhood changed or not relative to previous year. Since this is a household survey, there is no actual crime variable. We believe that the perceived crime variable more or less proxies actual crime.

5.2 Results

Tables (3) and (4) report the impact of Syrian refugees on both actual and perceived housing rents in the treatment region after the refugee influx in comparison to control region. In Table (3), the first and the third columns depict the effect, when Southeast Anatolia is the only treatment region. Columns [2] and [4] refer to the case in which the Mediterranean region is also added into the treatment group. In the narrowly-defined treatment group, the additional increase in the housing rents due to refugee influx is 5.5 percent. When we enlarge the treatment region by including the Mediterranean region, the effect drops to 3.5 percent—but still statistically significant at 10 percent level. Hence, we conclude that housing rents increase

in the range of 3.5–5.5 percent among the refugee-receiving regions following the refuge influx on top of the usual increase in the control regions.

Table (4) shows the impact of refugee inflows on the rents perceived by homeowners. The increase in perceived rents as a result of the refugee inflow ranges between 1.7 to 3.6 percent depending on the specification of the treatment region relative to the control region. However, the significance of the effect is not robust to clustering standard errors in year-region level. Hence, the effect of refugees on the perceived rents is not as strong as the effect on actual housing rents. Not only the magnitudes are smaller but also significance of the effect is specification dependent. In other words, the increase in actual rents are not reflected in the perceived rents of homeowners. One explanation of this discrepancy could be the incorrect valuation of the homeowners due to the existence of refugees in their neighborhoods. It might be the case that higher demand pushes the actual rents up, but homeowners do not reflect that information into their dwellings due to having more refugees in the neighborhood.

Although there is a significant refugee effect on the housing rents in the Southeast Anatolia, the effect is not uniform among the low-rent and the high-rent dwellings as Table (7) suggests. When we divide the sample into above- and below-median rent sub-samples, the DID coefficient becomes negative and statistically insignificant for below-median rents. However, the increase in housing rents due to refugee inflows is in the order of 7 percent for above-median rent dwellings. Hence, the effect of refugees is operating through the high-rent dwellings.

The heterogeneity between high- and low-rent dwellings might be due to two distinct but related reasons. To start with, the local population might increasingly choose higher-rent dwellings if they are avoiding lower-rent areas with high refugee concentration. That might generate a demand pressure on higher rent neighborhoods. Moreover, the shift of locals toward high-rent dwellings mechanically creates a rise in rents in refugee-receiving regions due to the fact that rents paid by refugees are not observable in our sample.

Another decision margin closely linked to housing rents is homeownership. Observing a more

than normal rise in housing rents, household on the margin of homeownership decision might switch from rental units to own-homes in the refugee-receiving regions. Table (5) shows DID estimates of homeownership for narrowly and widely defined treatment regions. In the narrow specification, we do not observe a refugee effect on homeownership. However, we see a 3 percent additional increase in homeownership once we include the Mediterranean region in the treatment group. This observation points to a possible heterogeneity between Southeast Anatolia and Mediterranean regions. The response of housing rents are stronger in Southeast Anatolia whereas the response of homeownership is also significant for the Mediterranean region. Hence, it is reasonable to think that part of the refugee effect is absorbed by ownership decision in the Mediterranean region but not in Southeast Anatolia. One potential explanation is that the Mediterranean region is a very attractive location for tourists, so the housing market may have different characteristics in this region relative to Southeast Anatolia. The rental units are mostly allocated to tourists during the high season and that's probably why the rent response is dominated by the ownership response.

One of the channels, which can explain the heterogeneous response of below-median and above-median housing rents, is the increase in perceived crime in the refugee-hosting regions. However, Table (6) shows no additional increase in perceived crime in the refugee-hosting regions after the refugee influx. There are again two possible explanations for this observation. The first and the most obvious explanation is perceived crime is not a driving force in natives' renting and homeownership decisions. A less obvious explanation is the possibility of natives' relocation into safer neighborhoods due to negative attitudes toward immigrants.[18] This explanation is also consistent with the non-uniform effect of refugee influx on lower and upper end housing rents. If natives are moving into more expensive and at the same time safer neighborhoods due to this negative attitude (with no actual observation of an increase in rents), then we might observe an increase in above median housing rent together with no change in the perceived crime.

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[18]The refugee-receiving regions in Turkey exhibit significant ethnic diversity. Exploiting this diversity in the empirical analysis—for the purpose of understanding the micro-foundations of attitudes toward refugees—would be an interesting extension. However, our data set (as most of the major micro-level data sets in Turkey) does not provide information on ethnic background of respondents.

It will perhaps be useful to discuss the affordability of a move from low-rent neighborhoods to high-rent ones. That a household chooses to reside in a neighborhood with low average rent level does not directly imply that the household lives in poverty and cannot afford higher-rent dwellings. In fact, lower-rent neighborhoods in traditional cities in Turkey are the "old towns." Typical residents in such neighborhoods tend to have long tenures in the same unit. Our observation (which is also supported by news in popular media) is that traditional families with long tenures in those neighborhoods have moved to higher-rent "new" neighborhoods upon the arrival of refugees.[19] We also would like to note that rent differentials between high- and low-rent neighborhoods in Southeastern Turkey are not huge. Therefore, we believe that affordability plays little role in the mechanism we describe. In addition, Balkan and Tumen (2016) show that consumer prices went down and Ceritoglu, Gurcihan Yunculer, Torun, and Tumen (2017) report that wages did not change in the hosting regions upon the arrival of refugees. These two findings jointly suggest that the income effect due to decreased consumer prices may have allowed households allocate a larger fraction of their monthly budgets to housing expenses.

Finally, we find similar effects for the urban and rural households but the effect is significant only for low-educated household heads [see Tables (8) and (9).[20] The additional increase in housing rents realized by the low educated household heads is around 6 percent and statistically significant at 10 percent significance level. The effect is not significant for the high-educated household heads. If we consider education as a proxy for income, we can reconcile the results on education with the increase in above median housing rents. If the low-education, i.e., low-income, families are moving to better and more expensive neighborhoods, this would result in a pressure on the above-median rents as well as an increase in the rents paid by less educated

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[19]For example in Kilis, the province with the highest refugee to population ratio, there are historical stone mansions with large gardens. These mansions are located at the center of the old town. Established families, who are mostly well-known and reputable tradesmen in the town, had resided in those mansions. Over years, rents became more and more affordable in those neighborhoods due to ageing infrastructure, crowded city center, and shift in housing preferences toward modern apartments in respectable suburbs. As a result, right before the Syrian refugee wave, a mix of high- and low-income natives were residing in these old neighborhoods. Syrian refugees prefer to rent units mostly in this historical mansions for several reasons. Aside from affordability, refugee families mostly have polygynous marriages. Given their conservative life-styles and very large families, these mansions serve their interests well. The mansions are at the city center close to consumer and labor markets, so they do not need to commute for basic needs.

[20]The urban-rural comparison is useful, since it shows that (1) similar forces operate in both urban and rural areas and (2) statistical significance of the estimates for the urban areas are quite robust to using alternative standard error calculation methods. Note that the number of observations are small for rural areas, which suggests that what happens in rental markets in urban areas drives our results. This is consistent with the findings and the main message of the paper.

households. Overall, the observations point out a negative redistributive effect of refugee influx, where lower-income households are affected heavily given they need to pay higher rents and they are not in a position to make homeownership decision.

Our findings suggest negative attitudes towards Syrian refugees in Turkey. As we discuss in Section 4, there are three main channels through which these negative attitudes could generate conflict in the society, which may directly or indirectly affect the housing market. First, refugees may replace natives in the labor markets. Several papers, including Del Carpio and Wagner (2015) and Ceritoglu, Gurcihan Yunculer, Torun, and Tumen (2017), provide strong evidence that Syriab refugees have replaced natives in the informal labor market—especially for the jobs with low skill requirements. This means that conflict in the labor market may be one cause of negative attitudes. However, employers do not complain because they have greater access to low-cost labor. Some papers, including Altindag, Bakis, and Rozo (2018), document that there has been an increase in economic activity in the hosting region following the influx; therefore, the labor market explanation is inconclusive. Second, crime rates may have increased following the refugee the influx, as refugees were mostly young and uneducated relative to natives. Our findings suggest that there is no statistically significant increase in crime rates perceived by natives. Third, natives may get direct disutility from living in neighborhoods with high refugee density. Due to high refugee population in the hosting regions, there is severe congestion in the use of public goods and services. Examples include crowded public parks, health services, schools, traffic jam, and other basic services provided by local governments. Other than these goods and services, natives may not want to tolerate the unintended change in their lifestyles caused by refugee influx. Anecdotal evidence and news from local media suggest that there is some conflict between natives and refugees along these dimensions. So, we conclude that negative attitudes towards Syrian refugees in Turkey are mostly due to this third channel.

6 Concluding Remarks

Refugee movements have been intensified especially after the Syrian crisis. Although the policy debate evolves around the potential impacts of refugees on the developed economies (given that the developed countries can avoid admitting a large number of them), some countries could not avoid admitting them and have already started to experience those impacts. Turkey is a major example. Since the beginning of 2012, more than 3 million Syrian refugees crossed the border and settled in Turkey based on official figures. This inflow has been affecting a wide range of economic and social outcomes from labor markets to voting behavior.

In this paper, we investigate the impact of Syrian refugee inflows on housing rents in the hosting regions in Turkey. We find that, on aggregate, housing rents have exhibited a statistically-significant increase following the influx, which is not surprising. What is more interesting is that, contrary to some of the previous findings documented in the literature, we find that the increase mostly comes from the high-quality units. We argue that natives originally resided in the low-quality neighborhoods moved into high-quality neighborhoods and refugees substituted them. The demand for low-quality dwellings did not change significantly, but high-quality neighborhoods experienced a sharp surge in demand.

We argue that negative attitude towards refugees is likely the force generating this result. We propose three potential channels that can possibly feed the negative attitudes. First, there might be tension between natives and refugees in the labor markets due to both employment and wage effects. As refugees settle down and form their own social networks, they get easier access to labor market opportunities. Although the existing evidence somewhat support this view, low-cost refugee labor force boosts economic activity; so, the overall effect on attitudes is ambiguous. Second, crime rates may be going up in the hosting regions and neighborhoods as refugees are initially unemployed and, on average, much less educated than natives. Our results show that the perceived crime rates did not noticeably increase after the influx. Finally, natives get net disutility from refugee presence due to congested use of public goods and services. This is especially the case for some provinces on the Turkey-Syria border. We believe that

the congested public goods channels is the main driver of negative attitudes towards refugees and may also underlie residential segregation.

Our results imply that the refugee-native conflict in economic and social life has implications for the city structure in the sense that it may lead to sharp segregation, which can further feed socio-economic inequality that can have lasting impacts on second- and third-generation refugees. Timely policies targeted at facilitating refugee integration and minimizing the extent of segregation would be useful and welfare-improving for the whole society.

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Regional Distribution of Syrian Refugees

	Number of refugees	Ratio to native population (percent)
Kilis	128,605	98.30
Hatay	419,500	26.97
Şanlıurfa	446,789	23.02
Gaziantep	341,985	17.32
Mardin	92,259	11.59
Osmaniye	46,830	8.97
Kahramanmaraş	95,664	8.60
Adana	164,415	7.47
Adıyaman	27,236	4.46
Malatya	23,684	3.03

Table 1: *Source:* Ministry of Interior, Directorate General of Migration Management figures as of October 2017. Note that our period of analysis is 2010–2013. Ceritoglu, Gurcihan Yunculer, Torun, and Tumen (2017) report the refugee to population ratios in these cities by early 2014.

Summary Statistics

By Region and Treatment Status

	(1)	(2)
	Treatment	Control
Pre-treatment		
Housing rent	246.64	332.51
Perceived rent	196.38	276.76
Urban	0.69	0.66
Number of rooms	3.05	3.46
Size of dwelling	98.46	101.05
Bath or shower	0.96	0.98
Indoor toilet	0.90	0.95
Kitchen	0.86	0.97
Piped water	0.93	0.98
Hot water system	0.49	0.80
Post-treatment		
Rental amount	277.62	367.19
Perceived rent	211.41	283.29
Urban	0.68	0.66
Number of rooms	3.13	3.49
Size of dwelling	103.86	102.78
Bath or shower	0.93	0.96
Indoor toilet	0.82	0.91
Kitchen	0.91	0.97
Piped water	0.94	0.98
Hot water system	0.52	0.83

Table 2: Housing rent refers to monthly rent paid in Turkish liras (TL). Perceived rent is monthly TL amount reported by home owners as their estimate of rent for their dwelling. Number of rooms represents the room numbers in the dwelling except kitchen and bathrooms/toilets. Size of dwelling is reported in square-meters. All other variables represent percentage of housing units, which have the named amenities.

The Impact of Syrian Refugees on Housing Rents

	(1)	(2)	(3)	(4)
diff_n_w	0.0547**		0.0547*	
	(0.0250)		(0.0306)	
diff_w_w		0.0345*		0.0345**
		(0.0176)		(0.0146)
Observations	12,911	14,300	12,911	14,300
R-squared	0.5586	0.5618	0.5586	0.5618
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 3: **Effect on Housing Rents:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is the log of monthly housing rents that are declared by the household heads. The first and the third columns compare the treatment region to all other regions except the half-treated one. The second and fourth columns compare the two treatment regions to all control regions. Robust standard errors are given in the parentheses in the first two columns. In the last two specifications standard errors are clustered at the region-year level and given in the parentheses.

The Impact of Syrian Refugees on Perceived Housing Rents

	(1)	(2)	(3)	(4)
diff_n_w	0.0362***		0.0362	
	(0.0109)		(0.0245)	
diff_w_w		0.0169**		0.0169
		(0.0076)		(0.0200)
Observations	44,460	50,352	44,460	50,352
R-squared	0.7469	0.7382	0.7469	0.7382
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 4: **Effect on Perceived Housing Rents:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is the log of perceived monthly housing rents for those who do not pay rents. The first and the third columns compare the treatment region to all other regions except the half-treated one. The second and fourth columns compare the two treatment regions to all control regions. Robust standard errors are given in the parentheses in the first two columns. In the last two specifications standard errors are clustered at the region-year level and given in the parentheses.

The Impact of Syrian Refugees on Home Ownership

	(1)	(2)	(3)	(4)
diff_n_w	0.0173		0.0173	
	(0.0147)		(0.0105)	
diff_w_w		0.0321***		0.0321***
		(0.0107)		(0.0082)
Observations	57,301	64,592	57,301	64,592
R-squared	0.0902	0.0846	0.0902	0.0846
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 5: **Effect on Home Ownership:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is a binary indicator for home ownership. The first and the third columns compare the treatment region to all other regions except the half-treated one. The second and fourth columns compare the two treatment regions to all control regions. Robust standard errors are given in the parentheses in the first two columns. In the last two specifications standard errors are clustered at the region-year level and given in the parentheses.

The Impact of Syrian Refugees on Perceived Crime

	(1)	(2)	(3)	(4)
diff_n_w	-0.0108		-0.0108*	
	(0.0112)		(0.0062)	
diff_w_w		-0.0014		-0.0014
		(0.0069)		(0.0058)
Observations	57,301	64,592	57,301	64,592
R-squared	0.0902	0.0846	0.0902	0.0846
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 6: **Effect on Perceived Crime:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is a binary indicator if the household head states that there is high crime or violence incidence in the neighborhood. The first and the third columns compare the treatment region to all other regions except the half-treated one. The second and fourth columns compare the two treatment regions to all control regions. Robust standard errors are given in the parentheses in the first two columns. In the last two specifications standard errors are clustered at the region-year level and given in the parentheses.

Heterogeneous Effects across Rent Distribution

	Lower End	Upper End	Lower End	Upper End
diff_n_w	-0.0313	0.0702***	-0.0313	0.0702***
	(0.0302)	(0.0242)	(0.0313)	(0.0236)
Observations	6,544	6,367	6,544	6,367
R-squared	0.6207	0.6397	0.6207	0.6397
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 7: **Effects across Rent Distribution:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is the log of monthly housing rents that are declared by the household heads. The first and the third columns use the sample of houses at the lower end of the rent distribution. The second and the fourth columns use the sample of houses at the upper end of the rent distribution. All regressions compare the treatment region to all other regions except the half-treated one. Robust standard errors are reported in the first and second columns. Standard errors are clustered at the region-year level and reported in the third and fourth columns.

Effect in Rural and Urban Areas

	Rural	Urban	Rural	Urban
diff_n_w	0.0748	0.0554**	0.0748*	0.0554*
	(0.1093)	(0.0255)	(0.0421)	(0.0307)
Observations	1,726	11,185	1,726	11,185
R-squared	0.4229	0.5377	0.4229	0.5377
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 8: **Effects in Rural and Urban Areas:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample.The dependent variable is the log of monthly housing rents that are declared by the household heads. The first and the third columns use the sample of houses at he rural areas. The second and the fourth columns use the sample of houses at urban areas. All regressions compare the treatment region to all other regions except the half-treated one. Robust standard errors are reported in the first and second columns. Standard errors are clustered at the region-year level in the third and fourth columns.

Effect across Household Head's Education Levels

	Low Educated	High Educated	Low Educated	High Educated
diff_n_w	0.0556**	0.0537	0.0556*	0.0537
	(0.0253)	(0.0545)	(0.0295)	(0.0374)
Observations	7,570	5,341	7,570	5,341
R-squared	0.5899	0.4984	0.5899	0.4984
Urban-Rural	YES	YES	YES	YES
Region Fixed Effects	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES
House Characteristics	YES	YES	YES	YES

Table 9: **Effects across Household Head's Education Levels:** ***, **, and * refer to 1%, 5%, and 10% significance levels, respectively. Each cell comes from a different regression and a different sample. The dependent variable is the log of monthly housing rents that are declared by the household heads. The first and the third columns use the sample of houses where the household head has less than a high school degree. The second and the fourth columns use the sample of houses where the household head has a high school degree or a higher degree. All regressions compare the treatment region to all other regions except the half-treated one. Robust standard errors are reported in the first and second columns. Standard errors are clustered at the region-year level and given in the parentheses in the third and fourth columns.

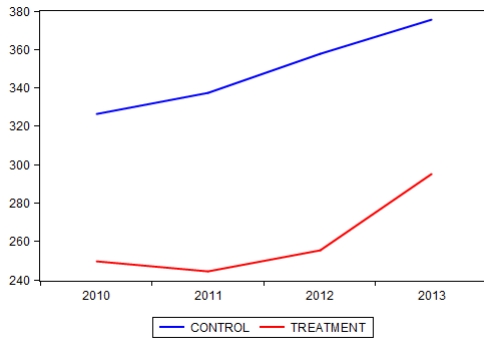**Treatment versus Control Regions**

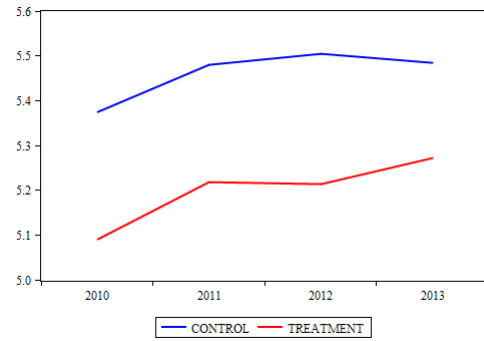
Figure 2.a: Rent paid

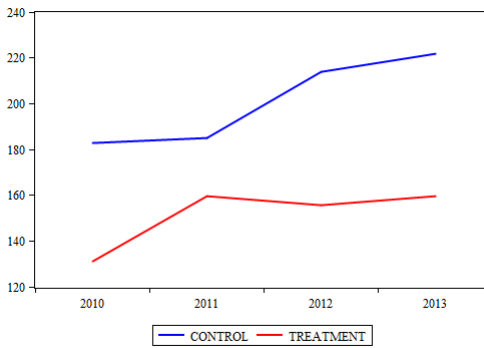Figure 2.b: Log of perceived rent
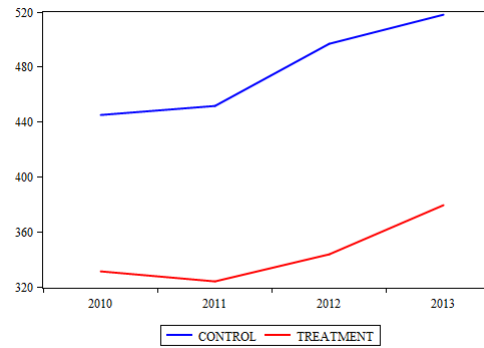

Figure 2.c: Rent paid (below median)

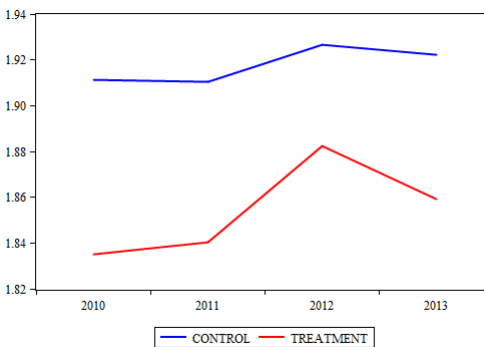
Figure 2.d: Rent paid (above bedian)

Figure 2.e: Perceived crime or violence

Figure 2: The table reports the mean values of the variables in treatment and control groups. Treatment area is the Southeastern Anatolia while the control area includes all regions except the half treated region.