Are Refugees a Burden? Impacts of Refugee Inflows on Host's Consumption Expenditures

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Abstract

We examine the impact of Syrian refugee inflows on the consumption expenditures and income of Jordanian nationals. We combine administrative data with individual panel data and exploit the fact that after the beginning of the Syrian conflict in 2011, refugees have relocated disproportionately to areas close to the three largest refugee camps. We find that higher refugee inflows lead to a redistribution of the composition of locals' consumption expenditures in favor of greater spending on housing and transportation and lower expenditures on food, education, health care, and communication. Higher housing expenditures are accompanied by a decline in housing quality for young individuals working in the informal sector.

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I Introduction

Do refugee inflows change locals' consumption decisions? Despite extensive research on the impacts of refugee inflows on host communities, this question has only been studied indirectly. Previous studies, for example, have largely focused on documenting the effects of refugee inflows on labor markets (see Card, 1990; Ruiz and Vargas-Silva, 2015; Del Carpio and Wagner, 2015; Ceritoglu et al., 2017; Borjas and Monras, 2017; Clemens and Hunt, 2017; Mayda et al., 2017; Peri and Yasenov, 2018) and prices (Alix-Garcia and Saah, 2009; Balkan et al., 2015; Tumen, 2016; Balkan and Tumen, 2016). Relatively little evidence, however, is available on the effects of refugee inflows on other sources of income or consumer expenditures as total or by type. The combination of changes in total income and relative prices, however, can be translated into drastic shifts in individual consumption patterns which can ultimately affect the welfare and quality of life of the individuals living in host communities. Understanding these patterns is crucial for determining whether action needs to be taken (and which action to take) to ameliorate the potential impacts that sudden and large refugee inflows can have on host communities.

In this article, we combine annual individual level panel data and administrative surveys from multiple sources in Jordan to present new evidence on the effects of Syrian refugee inflows on the level and composition of consumption expenditures and income of host communities. We exploit subdistrict-year (or governorate-year) level variation and use a difference-in-difference methodology to compare individuals located in regions closer and farther away from the three largest refugee camps before and after the beginning of the Syrian Civil War in 2011.

Despite the fact that according to Jordans most recent Housing and Population Census in 2015, approximately 80% of the Syrian refugee population in Jordan lived in urban centers, most refugees first arrived in refugee camps, where they were able to register as aid recipients and collect permits to leave the camps, issued by Jordan's Interior Ministry. As we show in our analysis, Syrian refugee populations in Jordan have tended to resettle close to the three formal refugee camps.

Our results show that after the beginning of the Syrian conflict in 2011, Jordanian nationals

living in areas close to the refugee camps have experienced changes in the composition of their consumption expenditures. We observe, in particular, that individuals close to refugee camps have seen an increase in their housing and transportation expenditures, for which they are compensating by decreasing their consumption of non-durables (including food), education, health care, and communication. Although we do not find evidence of a change in the overall level of consumption for the population as a whole, we observe reductions in the consumption levels of individuals with educational attainment below the high-school level. We also find evidence that the increased housing expenditures are being accompanied by a decline in the quality of housing for individuals who are younger or work in the informal sector.

As we document in our estimates, the increments in housing expenditures are primarily driven by the large spikes in housing prices caused by the sudden increase in demand for housing units and the static supply of new dwellings.

When exploring for differential patterns in the incomes of individuals in relation to their proximity or distance from refugee camps, we observe that after the beginning of the war, individuals closer to refugee camps have higher real estate and rental income, lower self-employed income, and experience no changes in their salaried income. The increments in property and rental income are more pronounced for highly educated Jordanian nationals, who most likely own real estate.

We also explore whether the reduction in non-durable consumption and health-care and education expenditures is reflected in reduced access to health care and education, or has been associated with poorer childrens development outcomes (as children are the most sensitive to income shocks and changes in nutrition). We find no evidence of any effect of a higher exposure to refugee inflows on any of these outcomes.

Our results point to the importance of responding quickly to large sudden waves of migration by rapidly increasing the supply of housing. Slow housing supply responses may end up hurting local populations and refugees alike by increasing prices, reducing consumption, and ultimately negatively impacting welfare. They may also contribute to increased tensions between locals and

forced migrants.

In order to support the validity of our estimates, we also use a dynamic difference-in-difference model in which we estimate, on a yearly basis, the differences in the outcomes of interest between individuals located in regions closer and farther away from refugee camps. This exercise supports the validity of the parallel trend assumption and shows impacts of refugee inflows similar to the ones identified in the aggregate regressions. We also test whether our results are sensitive to our choice of measure for refugee inflows exposure by replacing the distance from refugee camps with the pre-existing settlements of Syrians that were established before the beginning of the Syrian Civil War (available through the Housing and Population Census of 2004). The results of this exercise point to the same conclusions. Finally, we rule out the existence of differential time trends, which are prior to the beginning of the Syrian crisis, in night light density or labor market outcomes as a proxy for economic growth for subdistricts closer and farther away from refugee camps.

This investigation contributes to the literature that studies the impacts of refugees on host economies. Most of the existing literature has focused on studying the impacts of refugee inflows on employment, hours worked, and wages (see Card, 1990; Ruiz and Vargas-Silva, 2015; Del Carpio and Wagner, 2015; Akgündüz et al., 2015; Stave and Hillesund, 2015; Ceritoglu et al., 2017; Borjas and Monras, 2017; Clemens and Hunt, 2017; Mayda et al., 2017; Peri and Yasenov, 2018 for examples). Other, smaller groups of studies explore the effects of refugee inflows on prices (Alix-Garcia and Saah, 2009; Balkan et al., 2015; Tumen, 2016; Balkan and Tumen, 2016; Al-Hawarin et al., 2018), firms (Akgündüz et al., 2018; Altindag et al., 2018), political outcomes (Dustmann et al., 2016; Rozo and Juan F., 2018), education outcomes (Assad, 2019), and overall economic growth (Alix-Garcia et al., 2018). The articles closest to this study are Fakih and Ibrahim (2016) and Fallah et al. (2018), who study the impacts of refugee inflows on Jordanian labor markets. In line with our results, these authors document no effects of refugee inflows on employed workers. We contribute to these groups of studies by presenting new evidence on the impacts of refugee migration on the composition of consumption and income of individuals living

in host communities.

The results of this study have important policy implications. First, our results suggest there is an urgent need to increase the supply of low-cost housing in areas with large refugee inflows. Increasing the supply of low-cost housing may not only control the rising trend of housing prices within Jordan but may also be an effective way to create jobs. Second, since the rising housing costs are experienced by all Jordanians while only the highly educated individuals see their rental and property income rise, policies that limit the supply of housing may increase income inequality among locals within areas receiving large refugee inflows.

The rest of the article is structured in seven sections. Section II describes the Jordanian context; section III describes the empirical framework, including data and identification strategy; section V and section V present robustness exercises. The last section offers a discussion of the results and some concluding remarks.

II The Jordanian Context

The escalation of the Syrian Civil War can be traced back to the beginning of 2011. According to the United Nations Refugee Agency (UNHCR), by 2018, the Syrian Civil War had displaced more than 13.1 million individuals, more than half of Syrias pre-crisis population. Approximately 5 million individuals have registered as refugees in other countries (see Figure I), approximately 650,000 of whom registered in Jordan. These figures, however, severely underscore the magnitude of the Jordanian refugee crisis. Data from the 2015 Housing and Population Census in Jordan, for instance, suggests that the country was then hosting 1.3 million Syrian refugees, corresponding to an increase of approximately 10% of the Jordanian population registered in 2015 (9.5 million people).

The Jordanian government has not adhered to the 1951 Geneva Convention and its subsequent 1967 Protocol, which guarantee that refugees within signatory countries are entitled to dignity and

rights in exile (ILO, 2015). Jordanian law, however, respects the concept of *non-refoulement* and mandates that refugees cannot be returned to a country in which they are liable to be subjected to persecution (Hilal and Shahira, 2008). In fact, Jordan maintained an open border with Syria at the beginning of the Syrian conflict in accordance with previous international agreements, allowing Syrians to travel freely across the border (Betts et al., 2017).

The refugee crisis was acknowledged by Jordan in 2012, when the first refugee camp, named Za'atari, was opened, as a result of coordinated efforts between the Jordan government and UNHCR. A second refugee camp, named Mrajeeb Al Fhood (known also as the Emirati Jordanian Camp), opened in 2013, and a third, called Azraq, was opened in 2014. Despite the fact that by 2016 two other, informal refugee camps had been set up in Jordan in Rukban and Hadallat and that small populations also developed in two transit centers in Cyber City and King Abdallah Park, approximately 80% of Syrian refugees live outside of camps (UNHCR, 2018). The refugees registered with the United Nations at refugee camps receive humanitarian assistance and shelter, but are not authorized to work in Jordan. In fact, no refugees were authorized to work in Jordan up until 2016, when a few work permits began to be issued (ILO, 2017).

Access to education and health care for refugees is only available to those who have registered with the Ministry of Interior and thus have service cards (otherwise known as MOI cards).[1] Refugees outside of camps have access to education mostly through second-shift schooling programs exclusively directed to Syrian refugees (Assad, 2019; Salemi et al., 2018).[2] Health care is provided free of charge for camp residents and is offered by some NGOs outside of camps, but is expensive. In fact, refugees outside of camps pay a foreigner's rate, which ranges from 35 to 60% above the price paid by uninsured Jordanians, whereas refugees without a card are not eligible to receive services at government health clinics (Salemi et al., 2018).

In 2013, however, the government started restricting Syrians from entering Jordan and began

[1]The cards can be obtained at refugee camps or local police stations by presenting Syrian documentation (which was often confiscated by authorities when they crossed the border), formal proof of place of residency, and certificate of the Ministry of Health indicating they do not have infectious diseases.

[2]The requirement of an MOI card for children to access education was dropped in 2018.

making significant efforts to keep refugees at camps. This policy change was prompted by security and economic concerns related to conflict spillovers. In March, for example, a Directorate of Security Affairs for Syrian Refugee Camps was created with a mandate to control the entry and exit of refugees to and from the camps. In addition, in June of the same year, formal western border crossings were closed to all but exceptional cases, pushing forced migrants to travel to informal crossings along the eastern side of the border (Betts et al., 2017). By June of 2016, Jordan had sealed the last entry points from Syria after a suicide bomber detonated a car bomb. Since then, the country has sporadically allowed entry to a small number of refugees after immense pressure from the international community (The New York Times, 2016).

In February 4 of 2016, the United Kingdom, Germany, Kuwait, Norway, and the United Nations hosted a Syria donor conference in London to come up with plans to support Syrian refugees and their host communities. As a result of this meeting, the "Jordan Compact" response plan was created. This plan secured pledges of $1.7 billion in international aid for Jordan to support its Syrian refugee response. As part of the plan, Jordan committed to gradually issue work permits for refugees (ILO, 2017).[3] Although by January 2016 approximately 45,000 permits had been granted, they only account for 3% of the Syrian refugees identified in the Jordanian population census of 2015.

II.1 Syrian refugees in Jordan

There are two sources of data to characterize Jordans refugee population: the Jordanian Housing and Population Census of 2015 and the Jordan Labor Market Panel Survey (JLMPS) of 2016. The Jordanian Population and Housing Census of 2015 counts 1.3 million individuals who identified themselves as refugees. Figure II compares their gender, age, and education level relative to that of the Jordanian population, suggesting that the refugee population is balanced in terms of gender and less educated than Jordanian nationals. We are not able to distinguish a notable difference in

[3]The plan envisioned employing refugees in firms that had more than 15% of Syrian employees, which, according to the Jordan Compact, will have the rules of origin temporarily relaxed for exports to the European Union.

the age distribution of these two groups of people.

The JLMPS is representative of the refugee population in Jordan in 2016. We used this data in Figure III to compare three groups of individuals: Jordanians, other non-Jordanian foreign nationals (excluding refugees), and the refugee population living in Jordan in 2016. Our results suggest that the refugee population has gender distribution that is similar to that of Jordanian nationals, although, as is common in forcibly displaced populations, the refugee population contains a higher number of females (though the difference is not significant). The refugee population, however, is slightly older than Jordanian nationals but younger than other non-Jordanians.

Concerning household size, there are no significant differences in household size or number of births between the refugee and Jordanian populations, which both have an average household size of approximately six members and four live births per woman. Refugees also have the lowest levels of education and show the lowest share of student population of the three groups. All three population groups generally reside in urban centers, but smaller share of the refugee population lives in urban areas relative to the other two groups.

Refugees also have the highest likelihood of being married relative to the other two population groups. They also marry younger and more commonly have marriages in which one of the spouses is younger than 18 years of age. However, refugee females have more decision power and are less likely victims of violence relative to the other two population groups.

Concerning their labor market status, most of the working population in Jordan is composed of men across the three population groups, but female refugees have the lowest employment probability of the three groups. In addition, most of the refugees work in the informal sector and, because of that, have less access to health services relative to Jordanian nationals.

In sum, refugees are poorer (as they are less educated and more likely work in the informal sector) and have less access to education and health services relative to Jordanians and other non-Jordanians. Refugees also form families younger in life, but female refugees are more empowered within their marriages than other women in Jordan.

III Empirical Framework

III.1 Data

This article combines five main sources of information described below.

1. Consumer expenditures data. Data on individual consumer expenditures and income by type comes from the Household Expenditure and Income Surveys (HEIS) conducted by Jordan's statistics agency (the Department of Statistics of the Hashemite Kingdom of Jordan) and made available to the public by the Economic Research Forum. They correspond to cross sections with individual- and household-level information on sociodemographics, income by type (including income from wages, self-employment, rents or property and transfers), and detailed consumption expenditures. We classified consumption expenditures into six main types corresponding to food,[4] non-food but non-durable expenditures,[5] durables,[6] housing,[7] health care,[8] education,[9] communication,[10] and transportation.[11] The HEIS surveys are available for the years 2006, 2008, 2010 (pre-conflict), and 2013 (post-onset of conflict). The surveys allow the location of individuals to be identified at the governorate level.

2. Individual-level panel data. We use individual level panel data available for 2010 (pre-conflict) and 2016 (post-onset of conflict) to examine the effects of refugee inflows on education and health access as well as on the quality of housing. The data comes from the JLMPS, which was

[4]Food includes expenses on food and non-alcoholic beverages. It includes total purchased food, total self-produced food, and total gifts and in-kind food. It also includes catering services and school-restaurant expenditures.

[5]Non-food but non-durable expenditures are estimated as total expenditures minus food expenditures, durables, and rental housing.

[6]Durables includes housing furnishings and furniture, major household appliances, other major housing equipment and operation, therapeutic appliances and equipment, purchases of transportation vehicles, telephone and telefax equipment, and durables for recreation and cultural activities.

[7]Housing includes actual and imputed rentals for housing.

[8]Health care including expenses on health, medical products, appliances and equipment, outpatient services, and hospital services.

[9]Education includes pre-primary and primary education, secondary education, post-secondary non-tertiary education, tertiary education, and education not definable by level.

[10]Communication includes all communication technologies, including postal services, telephone and telefax equipment, and telephone and telefax services.

[11]Transportation represents all expenditures on transport, including purchase of vehicles, operation of personal transport equipment, and transport services.

collected by the Economic Research Forum in cooperation with the Jordanian statistics agency.[12] The surveys include information on individual and household sociodemographics, housing conditions, access to public services, ownership of durable goods, labor market history and actual status, fertility, and gender attitudes. It allows the location of individuals to be identified up to the subdistrict level.[13]

3. Childrens health development outcomes. Data on childrens health development outcomes comes from the Demographic and Health Survey (DHS) conducted by the United States Agency for International Development (USAID) and the Jordanian government. It corresponds to cross-section surveys that collect primary data on household characteristics, fertility, family planning, and maternal and child health. DHS surveys women of reproductive age (15 to 49) about their households, their health, and that of their children. To minimize measurement error, we focus on health measures that are not self-reported, but rather directly measured in the interviews. They include information related to the height and weight of children younger than 5 years of age. Although the surveys also include information about mothers, we focus only on childrens outcomes as they may respond more quickly and more directly to short-term changes in nutrition or public service access. DHS surveys are available for 1997, 2002, 2007, 2009 (pre-conflict), and 2012 (post-onset of conflict). The surveys allow the location of the individuals to be identified at the governorate level.

4. Night light density and other controls. To test for the validity of our identification strategy, we use additional controls, including constructed subdistrict-year-level data on satellite night light density. Night light density data is processed by the National Oceanic and Atmospheric Administration (NOAA). NOAA uses the satellite images collected by the US Air Force Defense Meteorological Satellite Program. The images are collected by two satellites that circle the earth

[12]The wave of 2016 tracked households from 2010, including individuals who split to form new households. The 2016 wave also added a refresher sample that over-sampled neighborhoods which were identified in the November 2015 population census as having a high proportion of non-Jordanian households. Approximately 3,000 refresher households were added in the refresher sample, which stratified on governorate and urban/rural/(official) camps.

[13]Locality is also available, but we decided not to use it as we found large inconsistencies in the codes available at this geographic level.

14 times per day recording the intensity of Earth-based lights with their Operational Linescan System. Each satellite observes every location on the planet every night at some point between 8:30 and 10:00 p.m. local time. For years that have images from both satellites available, we simply average the data. Night light density values range from 0 (no light) to 63 (maximum light density). The information is produced in 30 arc second cells, spanning -180 to 180 degrees longitude and -65 to 75 degrees latitude.[14] We construct average light density at the subdistrict or governorate level, averaging across pixels at the desired level of aggregation. Satellite night light data is available annually from 2001 to 2013.

We also use controls for population density (available annually) and public services, housing, education, economic, and health quality indexes for 2010, which come from the Jordanian statistics agency and are available at the governorate level.

5. Location of refugee camps and Syrian pre-settlements in Jordan. Information on the exact location of the three formal and biggest refugee camps (i.e., Za'atari, Azraq, and the Emirati Jordanian Camp) and their populations in 2016 in Jordan comes from the United Nations Refugee Agency (see Figure IV for the exact location of the camps).

We also use data on Syrian settlements in Jordan before the beginning of the Syrian Civil War from the Housing and Population Census of 2004—the last census before the beginning of the Syrian conflict. The information comes from the Jordanian statistics agency and allows us to construct the ratio of individuals born in Syria but living in Jordan to overall population for each governorate in 2004. We use this information to test for the robustness of our results to alternative identification strategies.

Descriptive statistics for all samples are presented in Appendix A.

[14]The light is from cities, towns, and other sites with persistent lighting, including gas flares. Ephemeral events, such as fires, are discarded. We exclude the pixels that include gas flares.

III.2 Identification strategy

Our empirical strategy relies on comparing individual outcomes in locations that are exposed to larger refugee inflows with individual outcomes in those locations that are not similarly affected, before and after the onset of the Syrian Civil War in 2011. Refugee resettlement is a potentially endogenous decision and time-varying components for which we cannot account could be affecting both the resettlement pattern and individual behavior. Refugees, for instance, might choose to move to areas that are more prosperous, which would lead us to overestimate the effects of refugees on consumer expenditures. To solve these issues, we estimate the following specification:

$$ln(Y_{ilt}) = \pi \text{SID Camps}_l \times \text{Syrian Conflict Onset}_t + \gamma_l + \gamma_t + \Gamma X_{ilt} + \epsilon_{lt} \quad (1)$$

where i stands for individual, l stands for location (i.e., governorate or subdistrict, depending on data availability), and t for year; Y_{ilt} represents the individual outcomes, X_{ilt} is a matrix of individual- and location-year controls; *Syrian Conflict Onset*$_t$ is a dummy variable that takes the value of one after 2001; and γ_l and γ_t account for location and year fixed effects. SID Camps stands for the standardized weighted inverse distance of each individual to refugee camps, which we estimate as

$$\text{SID Camps}_l = \left[\frac{1}{\sum_{j=1}^{3}(w_c \times distance_{jl})}\right] \quad (2)$$

SID Camps$_l$, consequently, corresponds to the product of the inverse distance of each geographic unit l to each of the three main refugee camps j. The distance from each geographic unit to each refugee camp is calculated using the Euclidean distance formula from the centroid of each geographic unit to the centroid of each refugee camp. w_c are refugee population weights of each of the camps in 2016.[15] SID Camps was standardized to ease the interpretation of our results. Stan-

[15] They correspond to the ratio of the population registered in each refugee camp over the total population registered in the three camps. The data comes from the United Nations Refugee Office.

dard errors are clustered at the location level to account for time- serial correlation in outcomes across geographic areas. A battery of robustness tests that support the validity of our identification strategy are is presented in the section V.

III.3 Refugee camps in Jordan

The Jordan government has coordinated with UNHCR to open three refugee camps to respond to the large Syrian migration into Jordan: Za'atari, which opened in 2012; Mrajeeb Al Fhood, known also as the Emirati Jordanian Camp, which opened in 2013; and Azraq, which opened in 2014. The location of these camps and their registered population in 2016 is presented in Figure IV. Za'atari, the closest camp to the Syrian border, is the most populated camp.

The location of these camps mainly responded to the intensity and location on the flow of Syrian refugees to Jordan and to land availability. Za'atari, for example, was built on land from an old military base totaling an area of 5.3 squared kilometers (Huynh, 2015).

Once refugees are registered inside a camp, they are not officially allowed to leave unless they have a Jordanian sponsor who can fill out the necessary paperwork for their relocation outside of the camps (Huynh, 2015). Despite these regulations, however, approximately 80% of the refugee population does live outside of the camps (UNHCR, 2018).

To test whether distance from the refugee camps is a good proxy for refugee settlements, we use 2015 census data. To do this, we estimate the share of the population living in each of Jordans 86 subdistricts in 2015 that are refugees and compare these figures with our subdistrict variable of standardized inverse distance from refugee camps as defined according to equation (2) in Figure V. As shown in the figure, *SID Camps* is a good predictor of refugees share of the population observed in each subdistrict in 2015. We speculate that refugees may be living closer to camps for continued access to humanitarian support and because they may feel a strong sense of community with other Syrian nationals.

IV Impacts of Refugee Inflows on Expenditures and Income

IV.1 Consumer expenditures

We first examine whether there are different patterns of consumer expenditure depending on proximity to or distance from refugee camps before and after the beginning of Syrian Civil War. The estimates of the specification in equation (1) using the logarithm of consumer expenditures as dependent variable are presented in Figure VI. Each bar in the figure corresponds to a separate regression that exploits variation at the governorate-year level. All regressions include fixed effects by governorate and year, as well as individual controls for the characteristics of the head of household,[16] the household as a whole,[17] governorate-year controls for proxies of population and economic development (including population density—excluding refugees—and night light density),[18] and full interactions of an index of living standards for 2010 and year dummy variables.[19] Standard errors reported in parentheses were clustered at the governorate-year level to maximize the number of clusters.[20]

The results suggest that individuals located in areas closer to refugee camps have experienced an increment in housing and transportation expenditures after the beginning of the Syrian conflict. Our estimates suggest that when distance from refugee camps (as measured by *SID Camps*) is reduced in one standard deviation, housing expenditures increase by 3.8% and transportation expenses increase by 11.1%. The higher expenditures on housing and transportation are compensated by a reduction on all other types of expenditures such as food, communication, education, and health. We do not observe a significant change in overall consumer expenditures.

[16] Head of household characteristics include urban or rural location, age, marital status, education level, source of income, and main economic activity.

[17] Household-as-a-whole characteristics include number of household members, number of male households members, number of female household members, number of individuals below 14 years of age, number of individuals older than 65 years of age, and number of income earners in household.

[18] Although there might be concerns that night light density is endogenous to refugee inflows, we rule out this possibility in the robustness tests section.

[19] These include full interaction of year dummies and public services, housing, education, economic, and health quality indexes for 2010.

[20] There are only 12 governorates in Jordan.

We also explore for differential effects of refugee inflows on the consumer expenditures of Jordanian nationals with different levels of education, in Figure VII. For this purpose, we split our sample into one group of individuals with education levels of high school or higher and another group with lower education levels. Although both groups of individuals see an increase in their transportation and housing expenses (with reportedly higher increments for the group of individuals with higher education), we only observed an overall negative impact on the level of consumption expenditures for the group of individuals that have less-than-high school educations. Our estimates suggest that when the distance from refugee camps is reduced in one standard deviation, overall consumer expenditures for less-educated individuals drops by 1.8%. Less-educated individuals also see a reduction in almost all of the other itemized categories of consumption (including non-food, food, communication and health expenses), the same effects are not observed for highly educated individuals.

IV.2 Income

We use the HEIS data to study the impacts of refugee exposure on types of income in Figure VIII. In line with our previous results, the estimates consistently show that individuals located closer to refugee camps see an increase in their rental and property income. Our estimates suggest that when the distance from camps is reduced in one standard deviation, rental and property income increases by 5.8%. The estimates also suggest negative effects of refugee exposure on self-employment and transfers income consistent with the idea that refugees may be displacing individuals who work in the informal sector or may be crowding out public funds. Similar results have been documented for the effects of Syrian refugee inflows on Turkish labor markets by Del Carpio and Wagner (2015) and Altindag et al. (2018). In addition, consistent with previous studies on the effects of refugees on Jordanian labor markets by Fallah et al. (2018) and Fakih and Ibrahim (2016), we do find evidence of any significant effects of refugee exposure on salaried income.

We also explore the effects of refugee inflows for individuals in relation to educational level

in Figure IX. Our results suggest that individuals of all education levels see a similar decrease in self-employed income and increase in rental and property income in response to refugee inflows. However, the effects of refugee inflows are more pronounced on the rental and property income of individuals with higher levels of education.

IV.3 Housing quality

Overall, our results suggest that after the beginning of the Syrian Civil War areas closer to the refugee camps have experienced higher housing and transportation expenditures relative to the regions farther away. A subsequent question is whether the higher expenditures on housing are also accompanied by a decline in the quality of housing.

To test this hypothesis, we employ individual-panel data from the JLMPS available before (2010) and after (2016) the beginning of the Syrian Civil War. For these estimates we are able to exploit subdistrict-level variation, since the location of the individuals can be identified at this geographic level.[21] We restrict our sample to Jordanians of working age (ages 15 to 64) and stratify the sample by gender, education level, formality of job (defined as whether the individual is employed is affiliated to social security), and age.

We use this data to estimate the specification presented in equation (1) using number of rooms in the dwelling, surface area, and floor materials as dependent variables. These were the only variables with sufficient variation to test for the effects of exposure to refugee inflows. Each regression includes fixed effects by individual and year, and controls for age, years of education, marital status, gender, urban or rural location, and for the education level of the mother and father of the individual. Standard errors reported in parentheses were clustered at the subdistrict level.

We do not find any evidence supporting the idea that higher housing expenditures are being accompanied by a change in dwelling quality (see Figure X). We do find, however, that individuals

[21] Jordan is divided into 12 governorates and 85 subdistricts. In fact, the JLMPS also includes the geographic location of the individual by locality. We refrain from using this information, however, as we found large inconsistencies in it at this level of aggregation.

closer to refugee camps working in the informal sector and those ages 26 to 40 have had lower-quality floor materials since the Syrian conflict began. These results are in line with previous results by Al-Hawarin et al. (2018), who document that housing conditions for poor Jordanians have been adversely affected by the influx of Syrian refugees.

IV.4 Housing prices

A simple supply-and-demand housing model would suggest that the increase in housing expenses in areas more exposed to refugee inflows may be due to rising housing prices. The large refugee population shock expanded housing demand, but housing supply has been slow to respond, as construction takes time. A combination of both effects could easily be translated into higher housing prices.

In particular, data from the Jordanian Ministry of Planning and International Cooperation suggests that Jordan was already experiencing a housing shortage prior to the Syrian refugee crisis.[22] Figures from the same source suggest that the Syrian refugee influx translated into an immediate demand for housing of approximately 86,000 units annually, on top of the pre-existing average annual local demand of 32,000 units (MIOPIC, 2013). Additionally, monthly figures from the Central Bank of Jordan on the total number of residential and non-residential building permits suggest that the formal construction supply did not began to increase in Jordan until 2016 (see Figure XI).

We test for the effects of refugee inflows on housing prices using information on rental prices available through the Housing and Population Census of 2004 and 2015. The information is only available at the governorate level. Using this data, we estimate the percentage change in rental prices before (year 2004) and after (year 2015) the start of the Syrian Civil War. We then estimate the correlation of the change in rental prices and our measure of distance from refugee camps *SID Camps*. We present both sources of variation in Figure XII. The correlation between both variables is high and statistically significant (0.75).

[22]The Jordanian housing sector produced an average of 28,600 housing units per year during the period 2004–11, against an annual pre-crisis demand of 32,000 units.

We also estimate a regression of the average rental price (as a total and by room) on our measure of refugee exposure, including fixed effects by governorate and year. The results of this exercise are presented in Figure XIII. They suggest that the larger Syrian refugee inflows had significant and positive effects on housing rental prices in Jordan.

IV.5 Health and education access

Our results so far suggest that individuals more exposed to the refugee shock are increasing their housing and transportation expenditures and reducing their consumption of non-durables (including food), health care, and education. In this section, we explore whether individuals located in areas closer to refugee camps experience less access to education or health care after the beginning of the Syrian conflict. In addition, we examine whether the lower food expenditures are having effects on children's development indicators (measured through anthropometric measurements), as they are the most sensitive to nutrition shocks.

To test these hypotheses, we first estimate equation (1) using data from the JMPLS on the probability of being enrolled in an education establishment and the probability of having health insurance as dependent variables. We do not find any evidence of significant effects of refugee inflow exposure, as measured by proximity to refugee camps, on any of these variables (see Figure XIV)

Second, we examine whether the growth and weight development of young children who are presumably more sensitive to changes in nutrition is different for children located closer and farther away from refugee camps after the onset of the conflict. For this purpose, we employ measures collected for children ages 0 to 5 in the Demographic and Health Survey. These measures include height for age, weight for age, and weight for height. The data is available at the governorate level for the years 1997, 2002, 2007, 2009, and 2012. We find no evidence of an effect of refugee inflows on children's development outcomes (see Figure XV).

V Robustness Tests

We present evidence on the validity of our results in two ways. We first approach our question by using an alternative identification strategy and then present evidence on the validity of the parallel trend assumption by estimating a dynamic difference-in-differences model.

V.1 Alternative identification strategy

In Appendix B, we run our estimates replacing *SID Camps* with the interaction of the share of Syrian population pre-settled in each governorate before the onset of the Syrian conflict (available from the 2004 housing and population census) and the total number of individuals leaving Syria in year t. Formally

$$\text{Syrian Pre-settlements}_{lt} = \left[\frac{\text{Syrian Pop}_{l,2004}}{\text{Total Pop}_{l,2004}} \times \text{Syrian Aggregate Displacement}_{t}\right] \tag{3}$$

where *Syrian Pre-settlements* exploits governorate-year variation and follows the idea initially proposed by Card (2001) and Altonji and Card, 1991 (see Lewis and Peri, 2015 for a review of the literature on applications), which suggests that past migration patterns are excellent predictors of subsequent migration waves within the same ethnic groups.[23] We show the geographic variation of Syrian pre-settlements as defined by equations (3) in Appendix B.

We test for alternative patterns in consumption expenditures comparing governorates with a higher and lower share of Syrian pre-settlements after the beginning of the Syrian conflict. Consistent with our previous results we find a significant and positive effect of refugee exposure on housing and transportation expenditures. We also observe that individuals who live in governorates

[23] A new criticism of the validity of this type of shift-share instrument was recently proposed by Jaeger et al. (2018). The authors suggest that using pre-settlements of migrants in countries where migration flows are stable in time confounds short- and long-term causal effects. Our identification strategy is not sensitive to their critique because the inflows of Syrian refugees were sudden and large in scale as a consequence of the intensification of armed conflict.

with a higher share of Syrians saw an increase in their rental and property income (see Appendix B).

V.2 Validity of the parallel trend assumption

As our main estimates include location (governorate or subdistrict) and year fixed effects, their validity is not conditional to static differences between governorates (or subdistricts) or aggregate time trends. Our estimates are valid so long as the parallel trend assumption is satisfied, that is, if there are no other time-varying covariates that affect areas differently according to whether they are closer to or farther away from the refugee camps, changing after the beginning of the Syrian conflict. Although there is no fully robust test to validate the validity of this assumption, we provide evidence to support its validity by estimating a dynamic difference-in-differences model given by

$$ln(Y_{ilt}) = \sum_{j=t_0}^{T} \theta_j (year_j \times \text{SID Camps}_l) + \gamma_l + \gamma_t + \Gamma X_{ilt} + \epsilon_{ilt} \tag{4}$$

where l stands for geographic location (governorate or subdistrict), t stands for year, SID Camps$_l$ is defined in equation 2, $year_j$ is a dummy for year j; γ_l and γ_t account for location and year fixed effects; and X_{ilt} is a matrix of individual- and location-year controls. Considering that the Syrian Civil War began in 2011, our identification strategy will be valid so long as we observe that θ_j is not statistically significant before 2011.

We present the results of the dynamic difference-in-differences model as described in equation 4 in Figure XVI. The estimates exclude the year 2010, which is taken as a baseline. With the exception of consumption expenditures on durables and education, the regressions support the validity of the parallel trend assumption before the onset of the conflict (year 2011) and support the idea that housing and transportation expenditures have increased in areas closer to the refugee camps after the beginning of the Syrian conflict.

One relevant threat to the validity of our estimates is that regions that are closer to the refugee

camps are more or less prosperous relative to the other areas. It is possible, for example, that refugee camps are located closer to urban centers responding to aid-provision concerns. If this is true, areas closer to refugee camps may show better economic growth relative to areas farther away from camps, and these differences may be exacerbated over time. As such, our identification strategy may be confounding pre-existing differences in economic growth with the impacts of refugee inflows.

Although there is no governorate- or subdistrict-level time-varying data on economic growth with which to test this hypothesis in Jordan, we construct a measure of economic growth using satellite night light density, available between 2001 and 2013. As recent studies have shown, night light density is a good proxy for the long-term distribution of contemporary local economic activity and its changes are also effective ways of tracking short-term fluctuations in economic growth (see Bleakley and Lin, 2012; Henderson et al., 2012; Michalopoulos and Papaioannou, 2013 for applications). The analysis of night light density is particularly useful in developing countries like Jordan, where no subnational information on economic growth is available.

To test for pre-existing differences in night light density between areas closer and farther away from refugee camps before the beginning of the conflict (year 2011), we estimate the model in equation 3 using the logarithm of night light density as the dependent variables. The results of this exercise are presented in Figure XVII and confirm the validity of our identification strategy of rejecting the existence of pre-trends across subdistricts closer and farther away from refugee camps before the beginning of the Syrian Civil War in year 2011. The estimates also reject significant differences in economic development between areas closer and farther away from the refugee camps that appeared after the beginning of the Syrian Civil War.

We also test for the parallel trend assumption on labor market outcomes using the Labor Force Surveys available from 2006 until 2016. These correspond to annual cross sections representative at the governorate level. The results of this exercise are presented in Figure XVIII and support the validity of our identification strategy.

VI Discussion

In this article, we explore the effects of refugee inflows on the consumption expenditures and income of individuals living in host communities. For this purpose, we compare Jordanian nationals living in areas closer and farther away from the three main refugee camps before and after the outbreak of the Syrian conflict in 2011.

Our results suggest that individuals living closer to refugee camps face higher housing and transportation costs after the beginning of the Syrian conflict. The higher housing expenditures are compensated with lower expenditures on other consumption items such as communication, health, education, and non-durables, including food. The rising housing costs are translated into reductions in the overall level of consumption expenditures only for individuals whose levels of education are below the high-school level. We also find that individuals more exposed to refugee inflows who are younger and work in the informal sector live in dwellings of poorer quality. We do not find evidence that the reduction in health care or food expenses had any effect on access to health care or education or on childrens anthropomorphic outcomes.

When exploring the effects of refugee inflows on individual income, consistent with our estimates for consumption expenditures, we find positive effects of refugee inflows on rental and property income, negative effects on self-employment income, and no effects on salaried work. The positive effects on rental and property income are largely concentrated in individuals who have education levels higher than high school, and who thus presumably correspond to property owners.

According to Jordan's Housing and Population Census of 2015, more than 80% of the Syrian refugees in Jordan live outside of refugee camps. Consequently, the observed increases in housing expenses could be largely due to the demand shock that the higher population may be having on housing markets. Our empirical analysis supports this hypothesis, as we document that housing prices are higher closer to refugee camps after the beginning of the Syrian crisis.

Addressing the rising cost of housing is crucial to prevent welfare losses in the host population, to help the refugee population to survive and become economically independent, and to prevent more tensions and discrimination between Jordanian hosts and refugees. In the medium to long term, the implementation of such interventions as increasing the amount of low-cost, adequate housing available in the large urban centers, may prove effective for creating jobs and meeting the growing demand for housing without inflating prices.

Future research should urgently examine, in particular, the effectiveness of a variety of approaches to increasing the supply of quality housing for refugees. Insightful research, for example, should examine whether humanitarian programs such as cash-for-rent grants to refugees and low-income Jordanians, which—although they are a lifeline for these populations and ensure that they have a roof over their heads—may also be pushing up housing prices.

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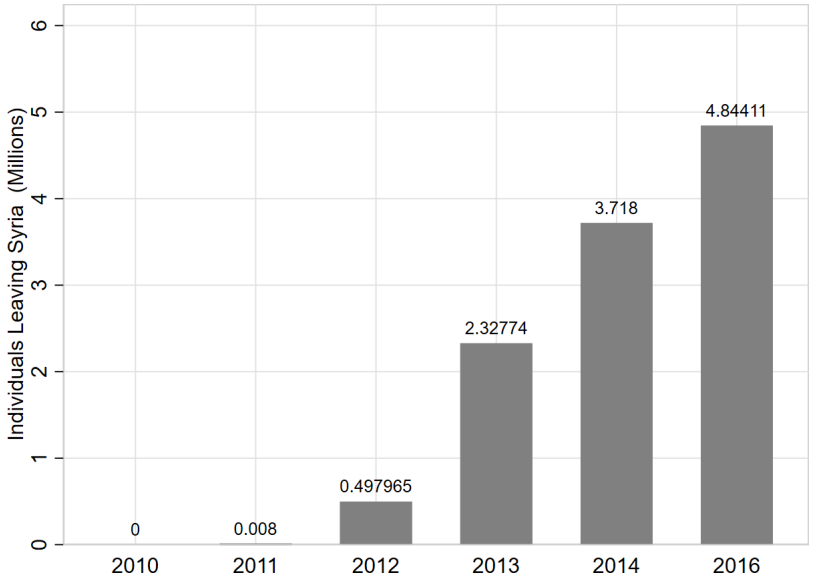
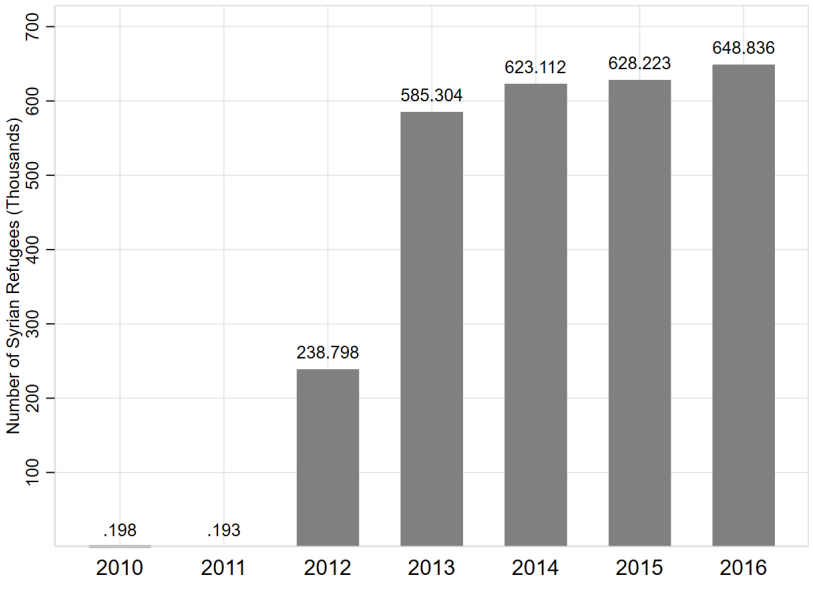
VII Figures

Figure I: Syrian refugee flows - United Nations Refugee Agency Data

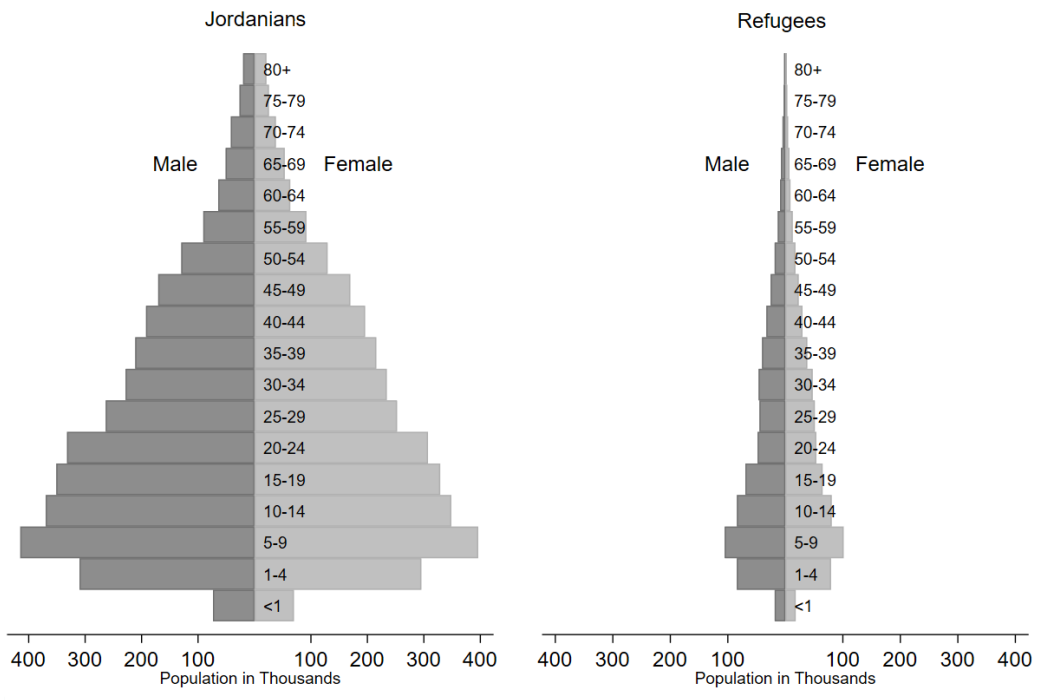


Panel A: Individuals that left Syria (registered individuals)

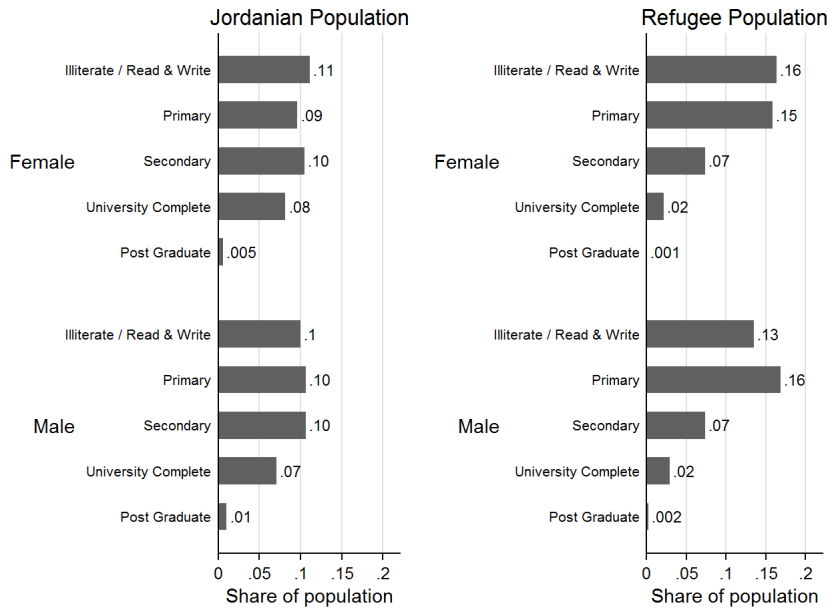


Panel B: Individuals in Jordan (registered individuals)

Figure II: Refugee characterization - Population and Housing Census 2015

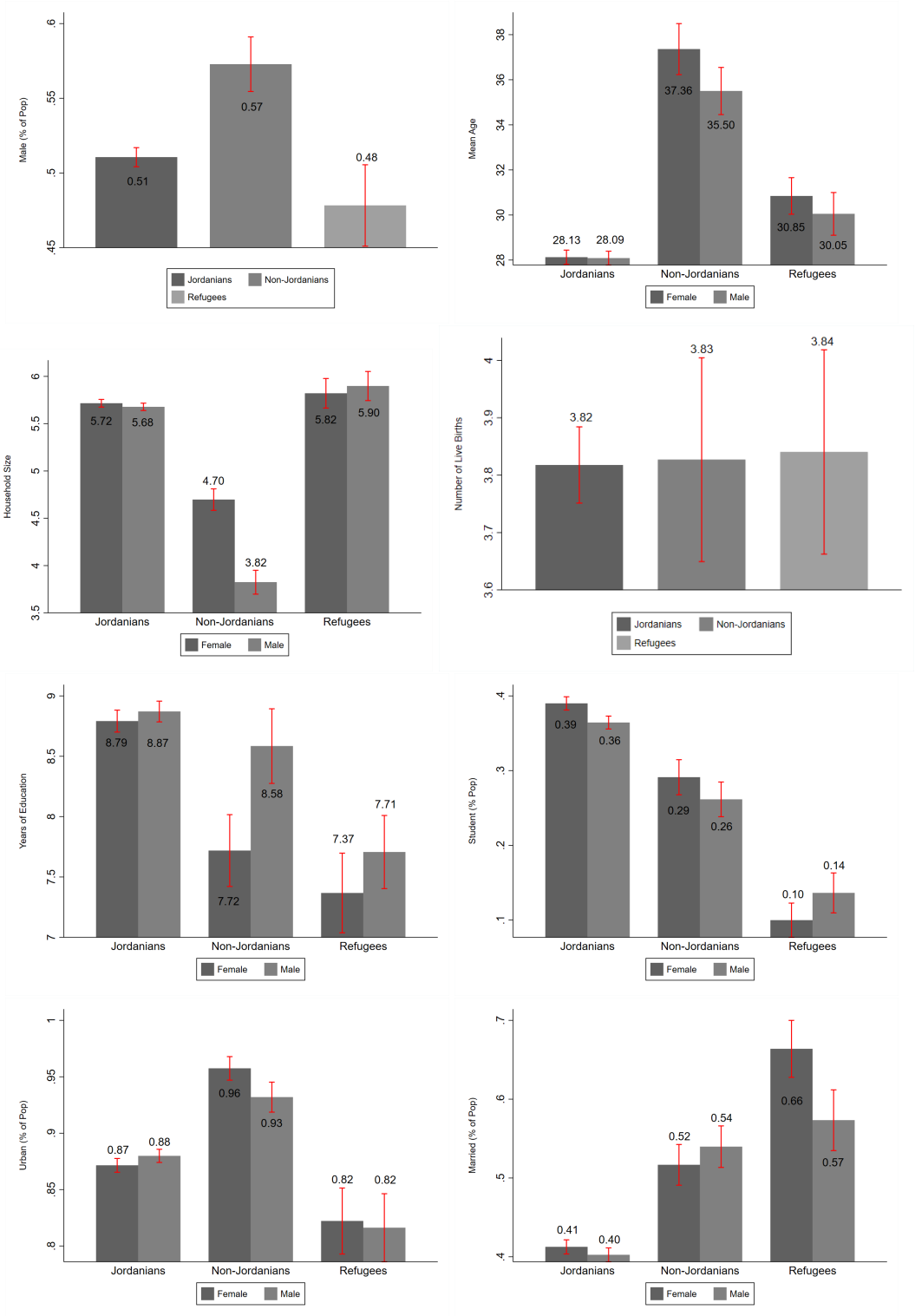


Panel A: Age and gender distribution



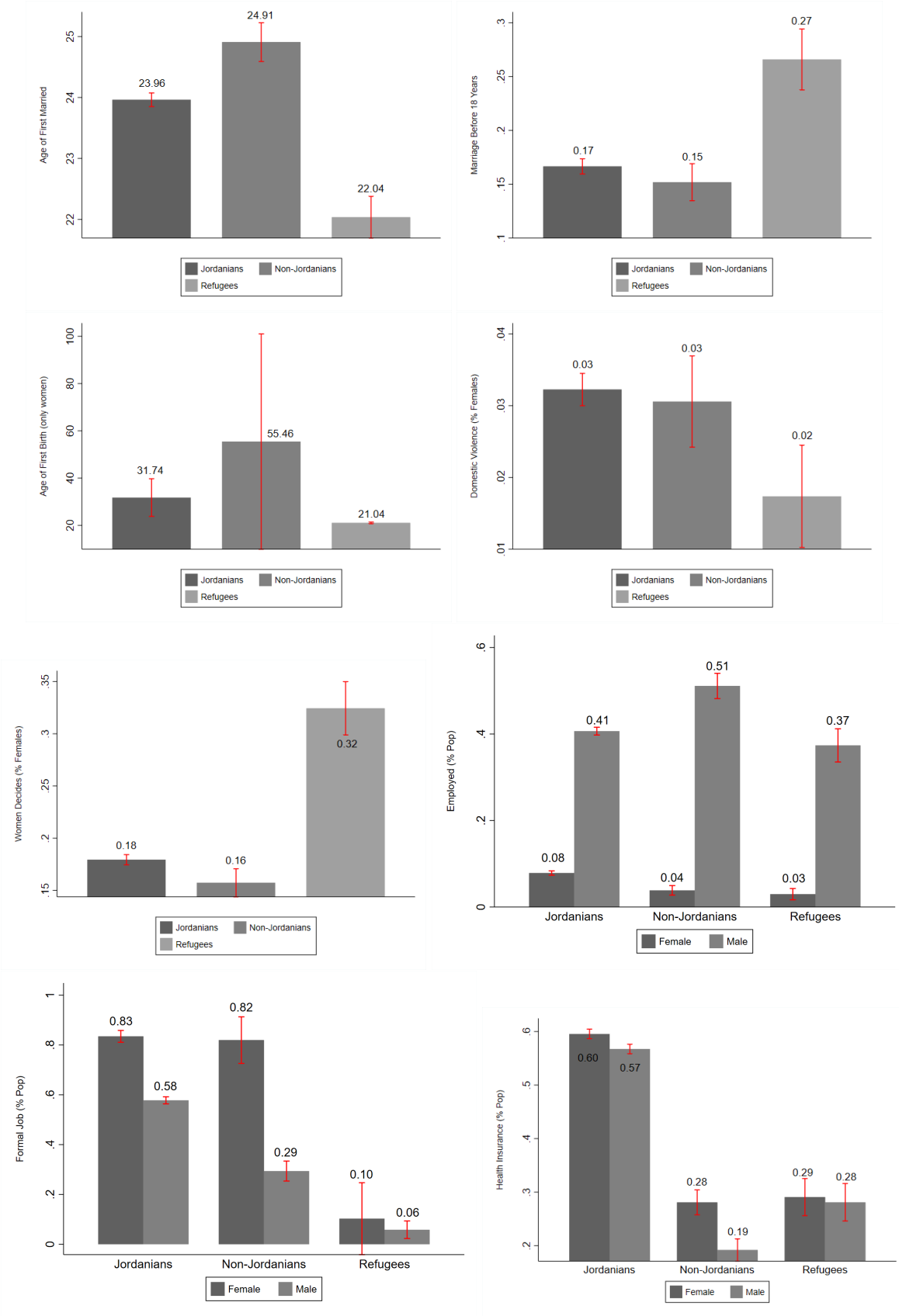
Panel B: Education attainment

Figure III: Refugee characterization - JLMPS 2016



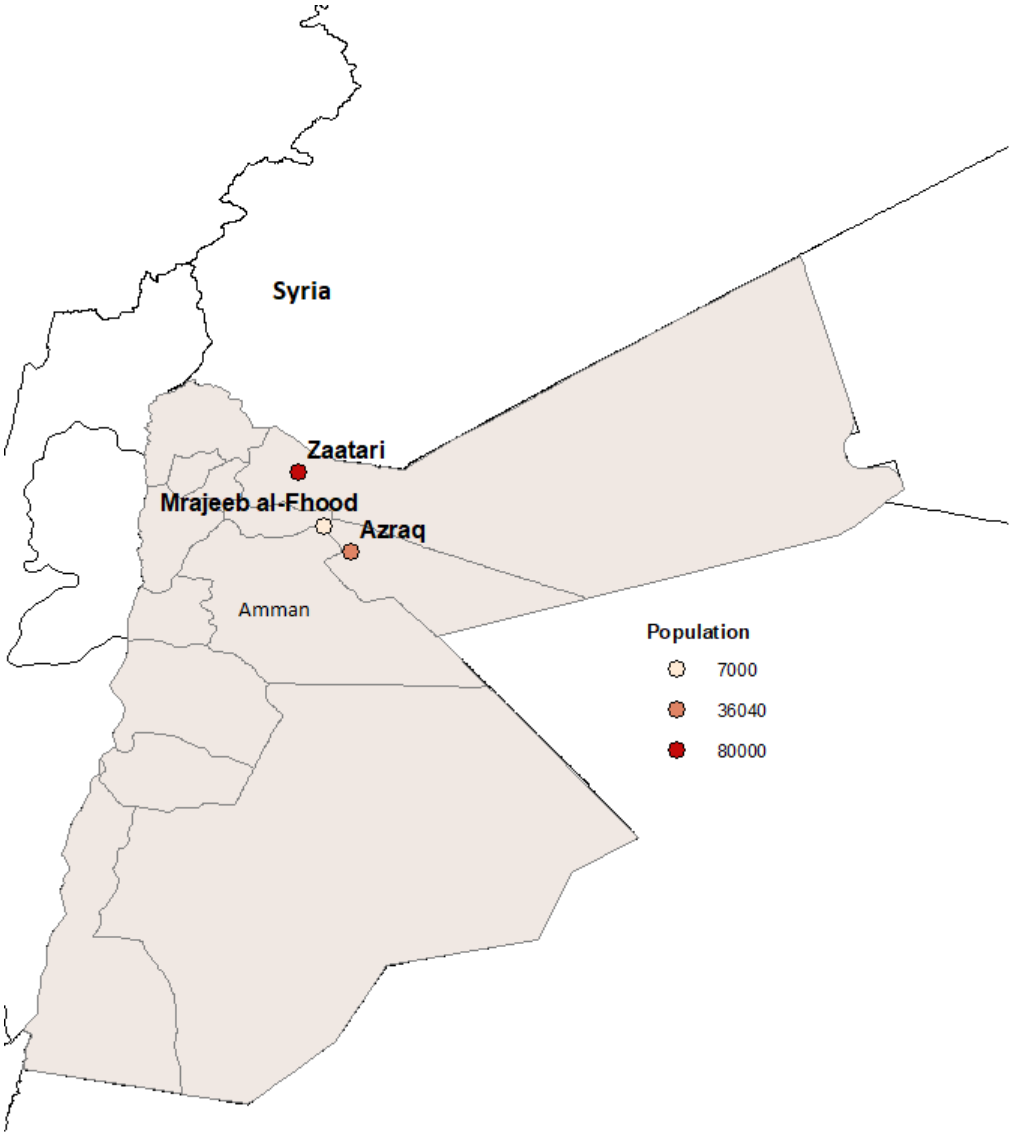
Notes: Red lines represent 95% confidence intervals for the mean. Source Data: JMPLS 2016.

Figure III (cont'd): Refugee characterization - JLMPS 2016



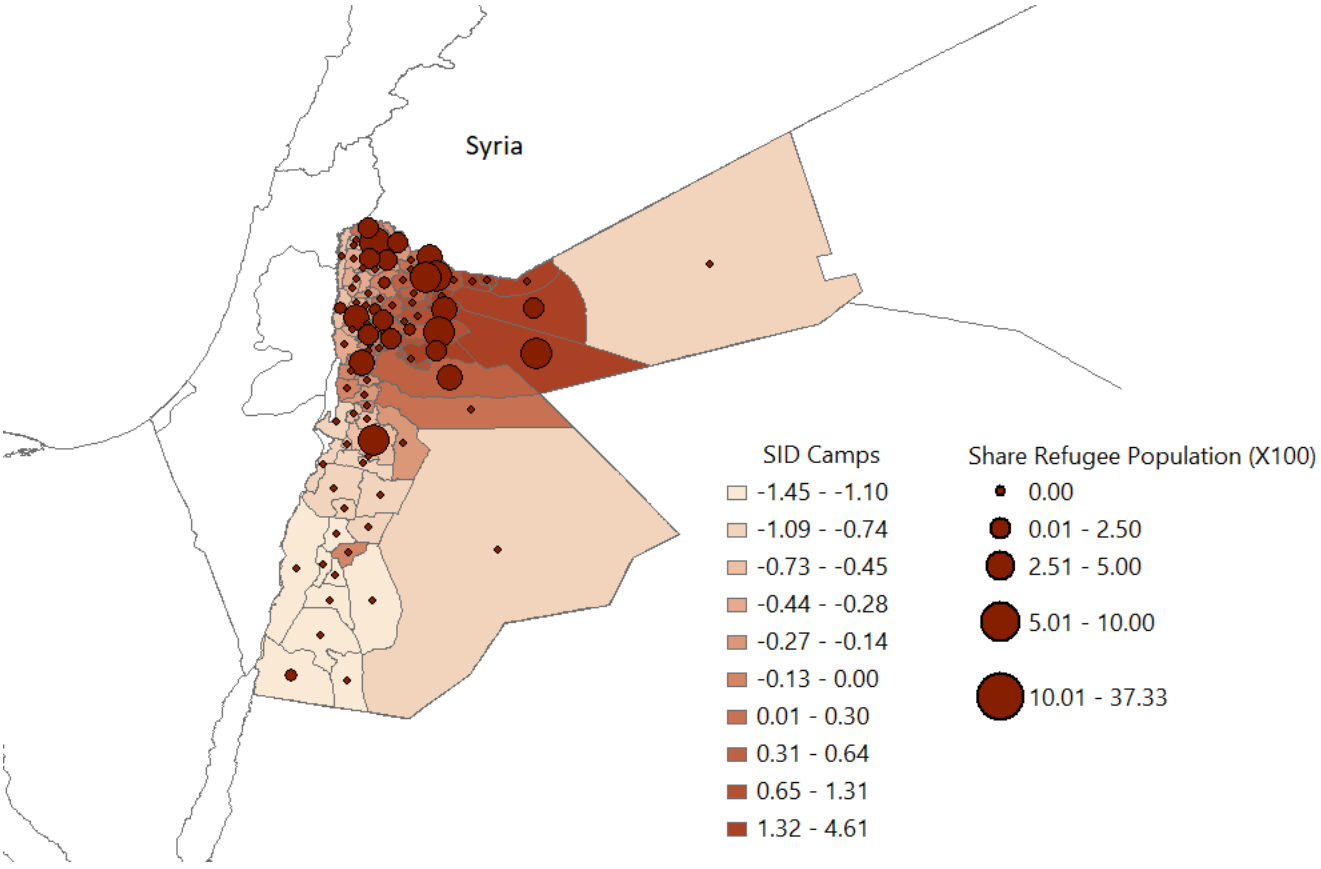
Notes: Red lines represent 95% confidence intervals for the mean. Source Data: JMPLS 2016.

Figure IV: Location of refugee camps in Jordan and their registered population in 2016



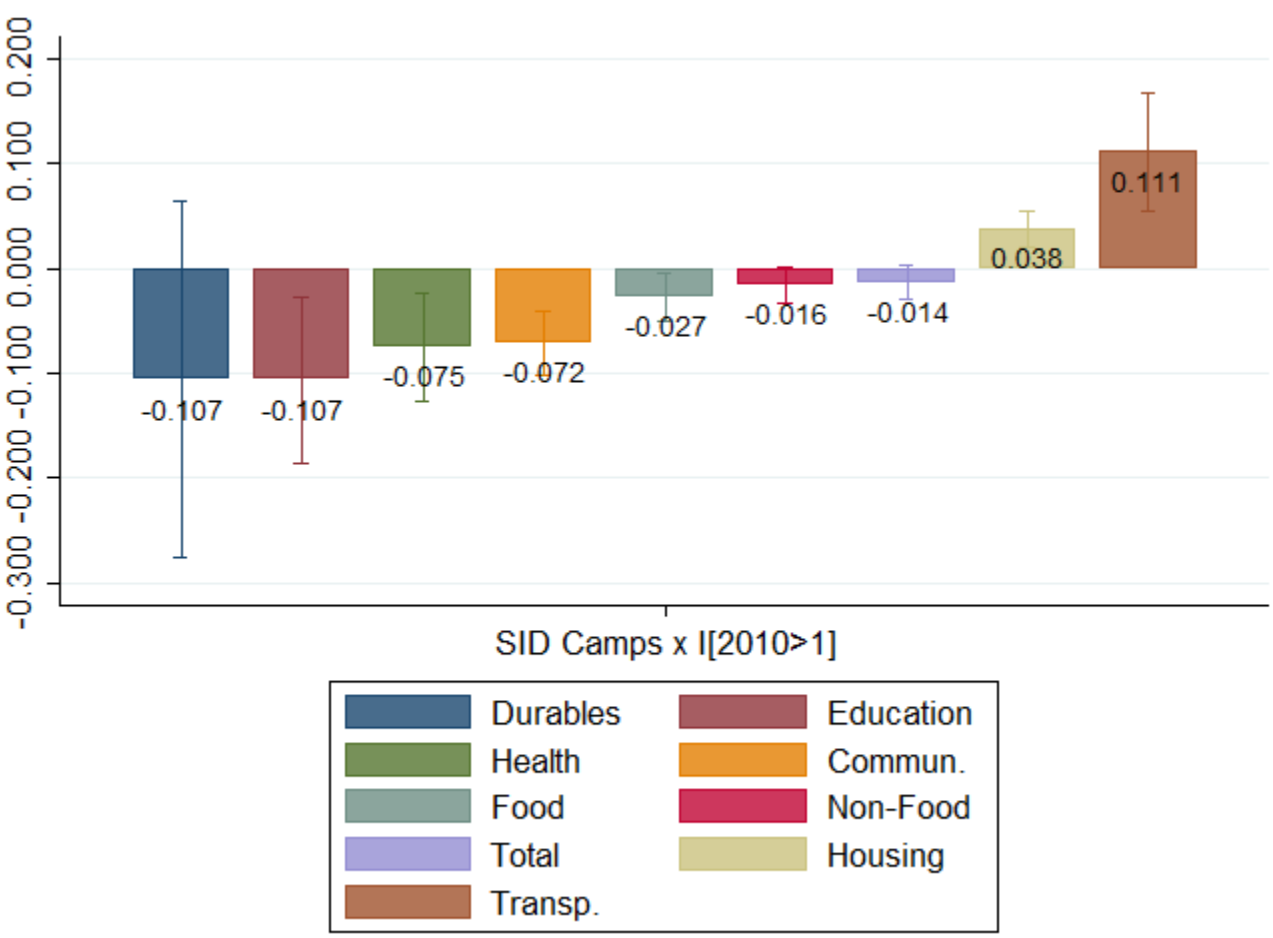
Notes: Figures on the registered population inside camps come from the United Nations Refugee Agency.

Figure V: Syrian refugee population in Jordan in 2015 and standarized weighted inverse distance to camps (SID Camps). Subdistrict Variation.



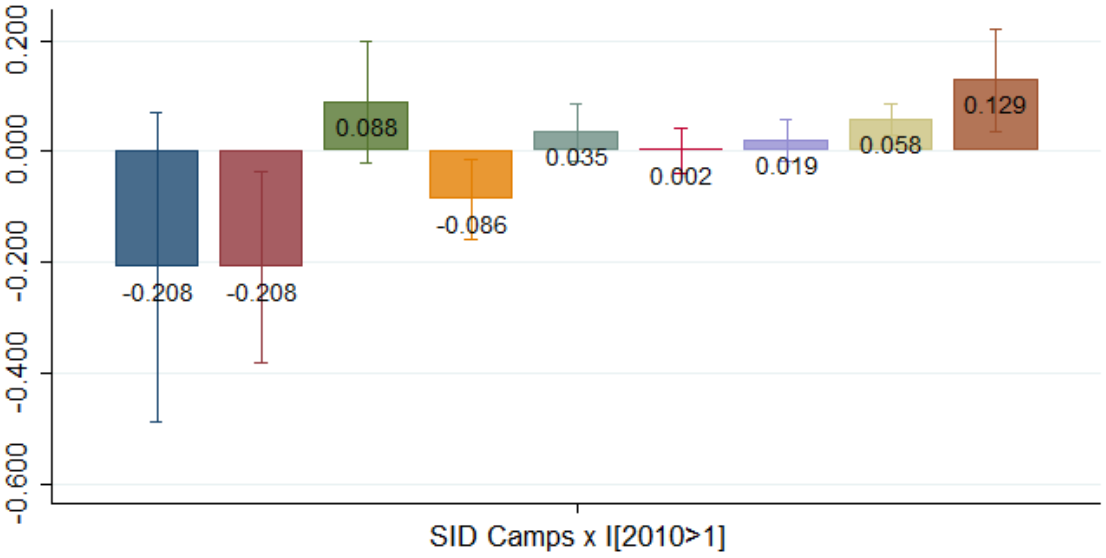
Notes: Figures on the Syrian refugee population in Jordan come from the Jordanian Housing and Population Census of 2015.

Figure VI: Impacts of refugee inflows on consumer expenditures (dependent variable in logs)

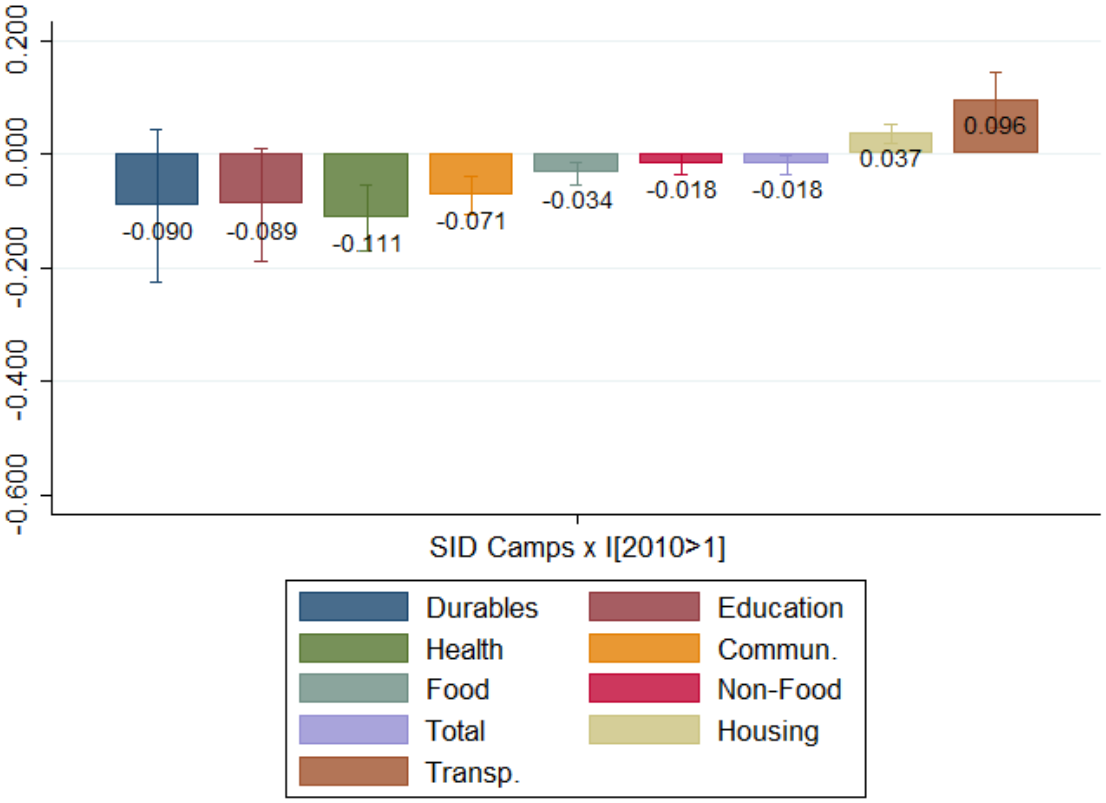


Notes: Each coefficient corresponds to a separate regression and includes approximately 4,150,710 observations. The sample only includes Jordan households. Each regression includes fixed effects by year, governorate, and controls for the urban or rural location, number of household members, number of male households members, number of female household members, number of individuals below 14 years of age, number of individuals higher than 65 years of age, number of income earners in household, age of head of household, marital status of head of household, education level of head of household, source of income of head of households, and main activity of head of household. It also controls for population density and night light density at the governorate-year level and controls for full interactions of year and a governorate-level index of living standards for 2010. Standard errors were clustered at the region-year level. Bars show 10% confidence intervals. *Data Source:* HEIS 2006, 2008, 2010, and 2013.

Figure VII: Impacts of refugee inflows on expenditures by education level (dep. var. in logs)



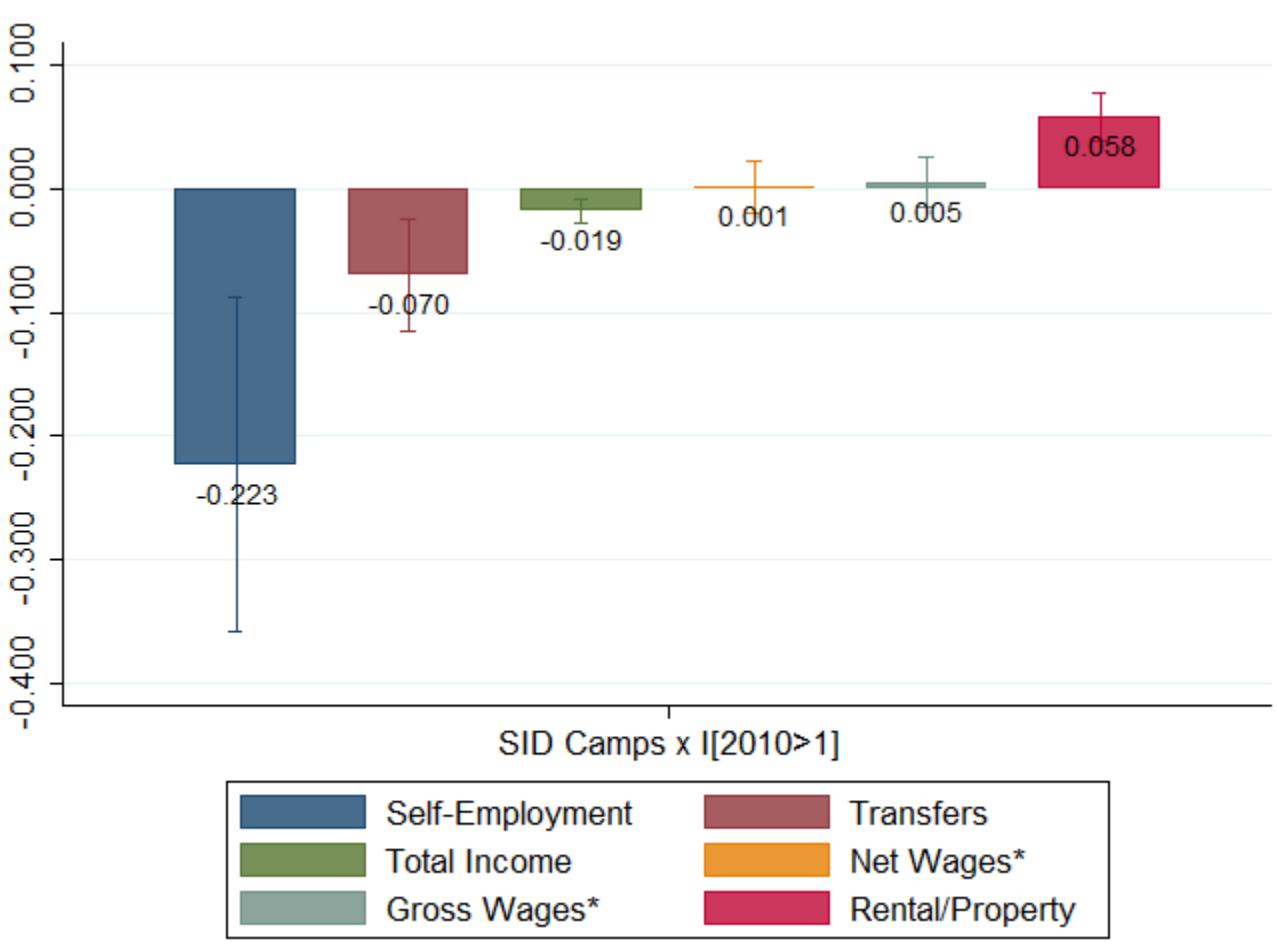
Panel A: Individuals with high education (more than high school)



Panel B: Individuals with low education (high school or less)

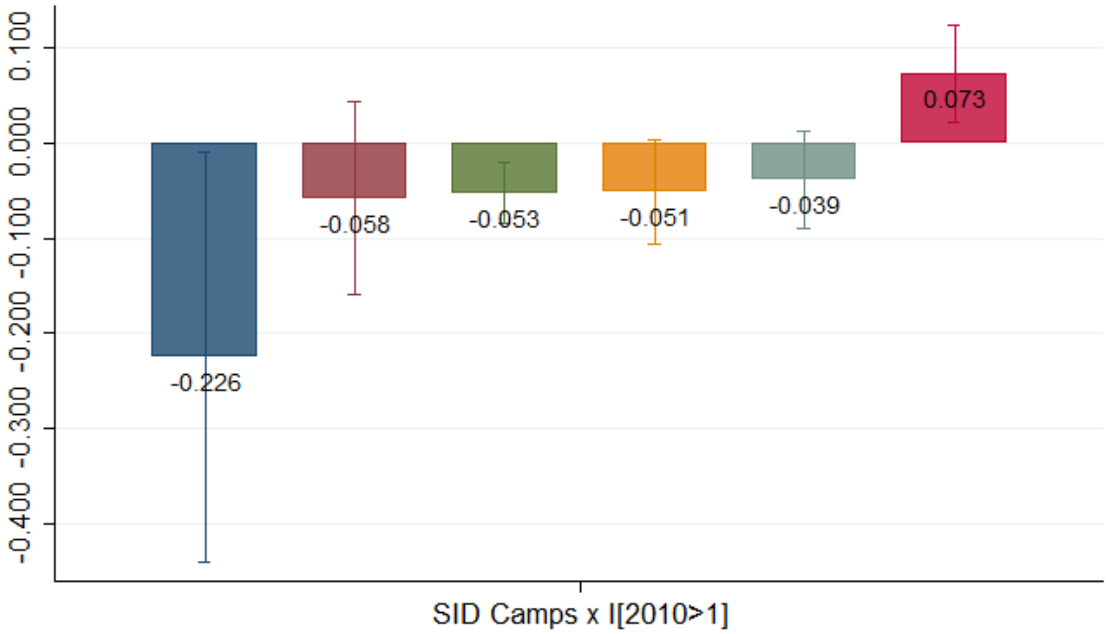
Notes: All details are the same as in Table VI.

Figure VIII: Impacts of refugee inflows on income (dependent variables in logs)

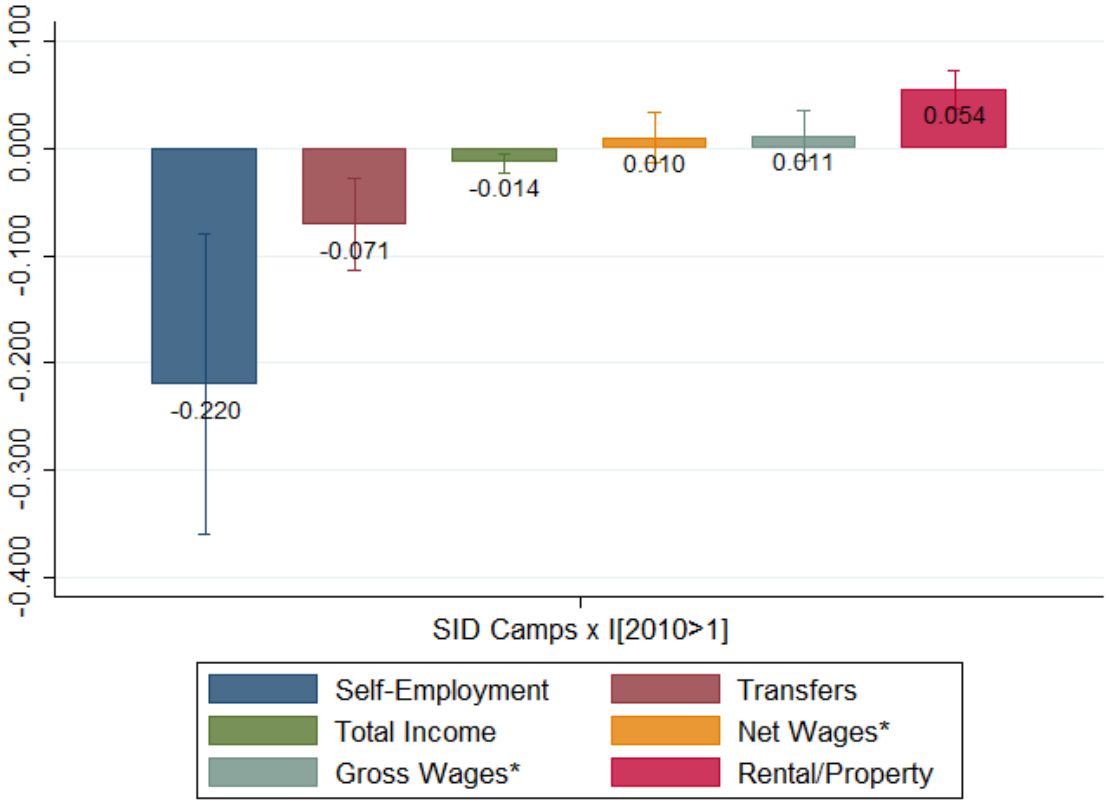


Notes: Each coefficient corresponds to a separate regression and includes approximately 4,150,710 observations. The sample only includes Jordan households. Each regression includes fixed effects by year, governorate, and controls for the urban or rural location, number of household members, number of male households members, number of female household members, number of individuals below 14 years of age, number of individuals higher than 65 years of age, number of income earners in household, age of head of household, marital status of head of household, education level of head of household, source of income of head of households, and main activity of head of household. It also controls for population density and night light density at the governorate-year level and controls for full interactions of year and a governorate-level index of living standards for 2010. Standard errors were clustered at the region-year level. Bars show 10% confidence intervals. Wages were transformed using the inverse hyperbolic sine transformation (see Burbidge et al., 1988 and MacKinnon and Magee, 1990 for details). The coefficients can be interpreted as a log transformation on the dependent variable. *Data Source:* HEIS 2006, 2008, 2010, and 2013.

Figure IX: Impacts of refugee inflows in income by education level (dep. var. in logs)



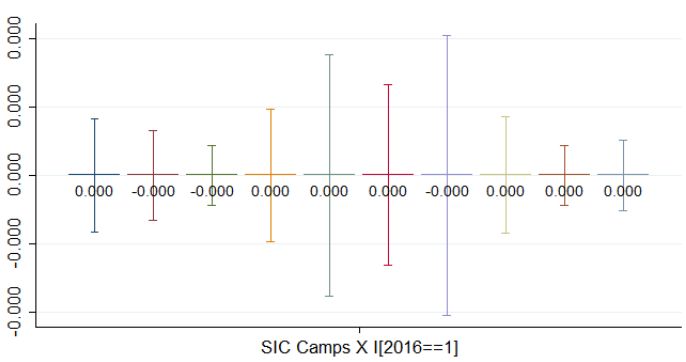
Panel A: Individuals with high education (more than high school)



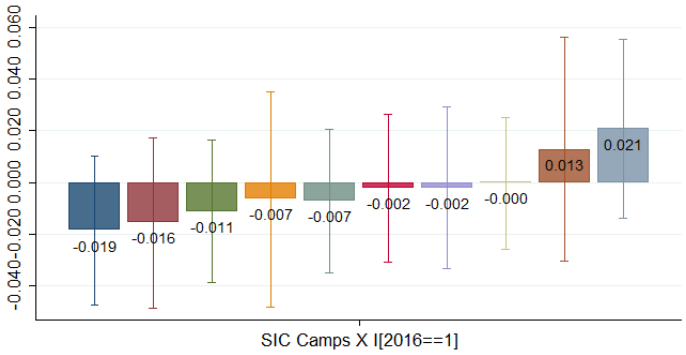
Panel B: Individuals with low education (high school or less)

Notes: All details are the same as in Table VIII.

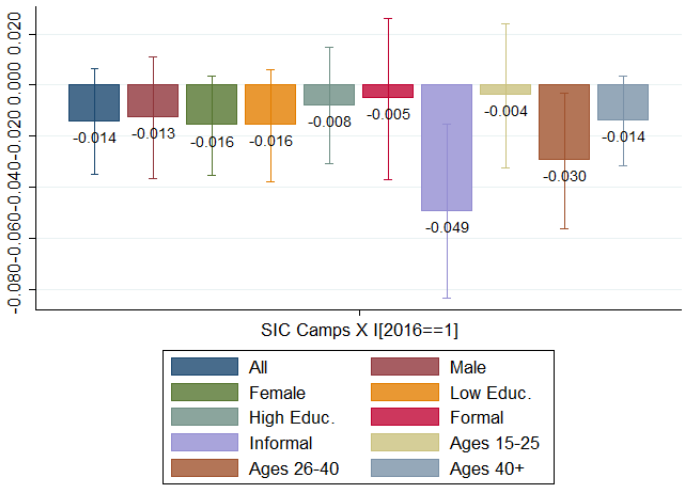
Figure X: Impact on refugee inflows on housing quality



Panel A: Log(N. Rooms)



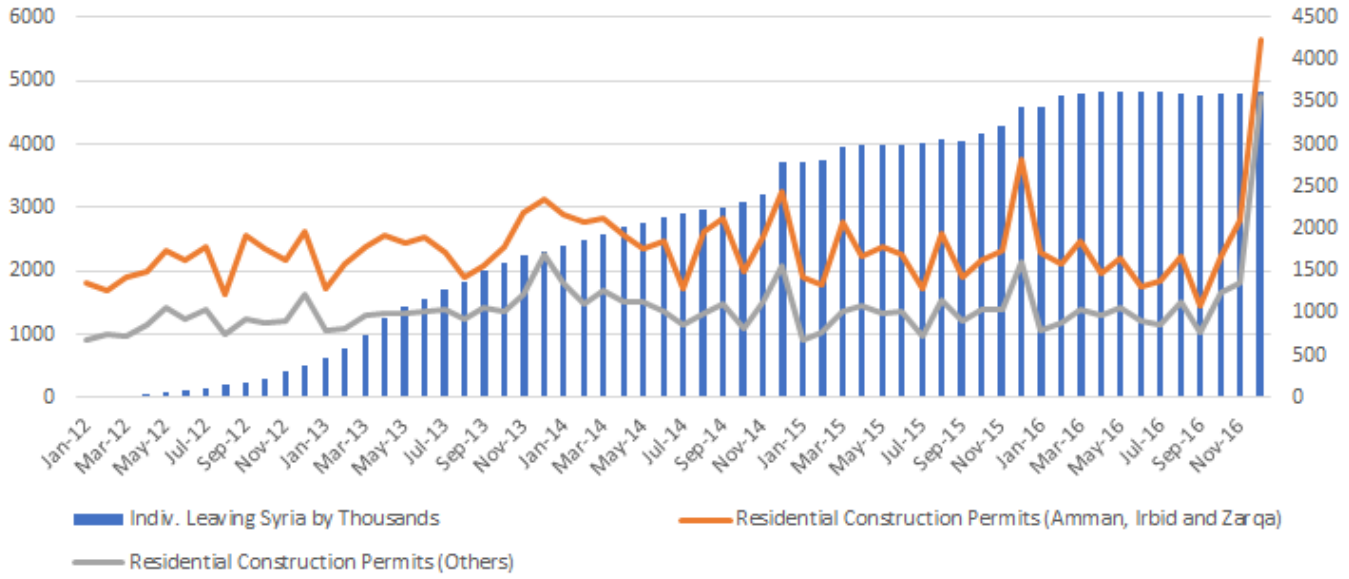
Panel B: Log [Dwelling area (squared meters)]



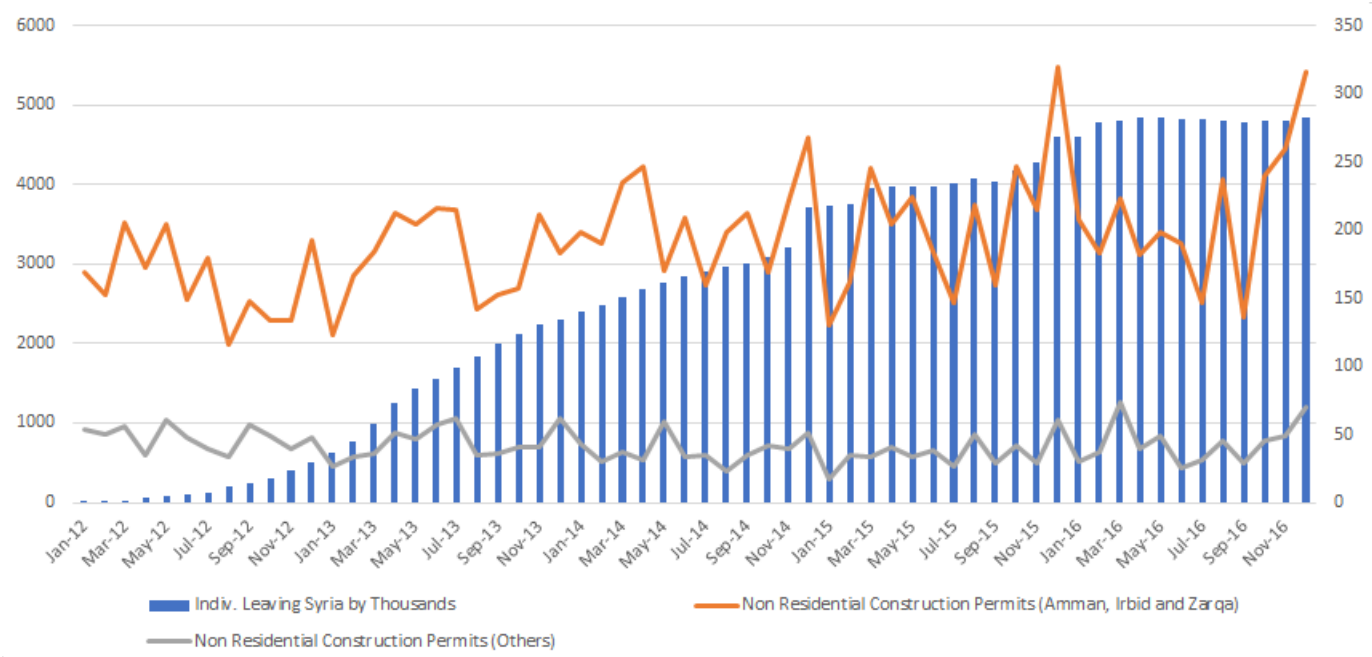
Panel C: Probability of adequate floor materials (=1 if Tile/Ceramic)

Notes: Each coefficient corresponds to a separate regression. The complete sample includes approximately 3,978,366 observations. The sample only includes Jordan nationals ages 15 to 64. Each regression includes fixed effects by individual, year, and controls for age, years of education, marital status, gender, urban or rural location, mother and father level of education. Standard errors were clustered at the subdistrict level. There are 86 subdistricts in the sample. Bars show 10% confidence intervals. *Data Source:* JLMPS 2010 and 2016.

Figure XI: Refugees leaving Syria and Jordan building permits (monthly figures)



Panel A: Residential permits



Panel B: Non-residential permits

Figure XII: Percentage change in rental prices (2004 to 2015) and SID Camps

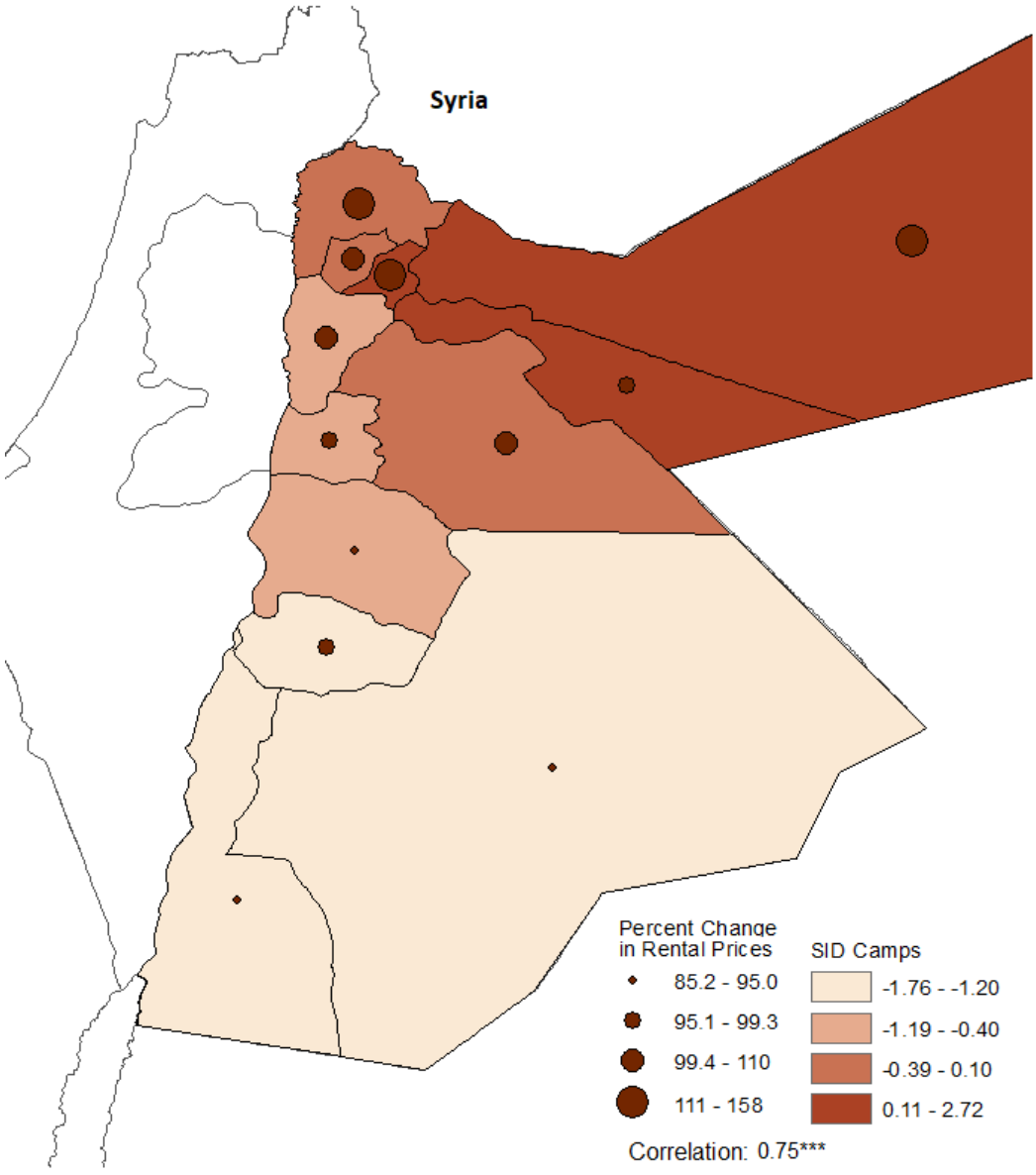
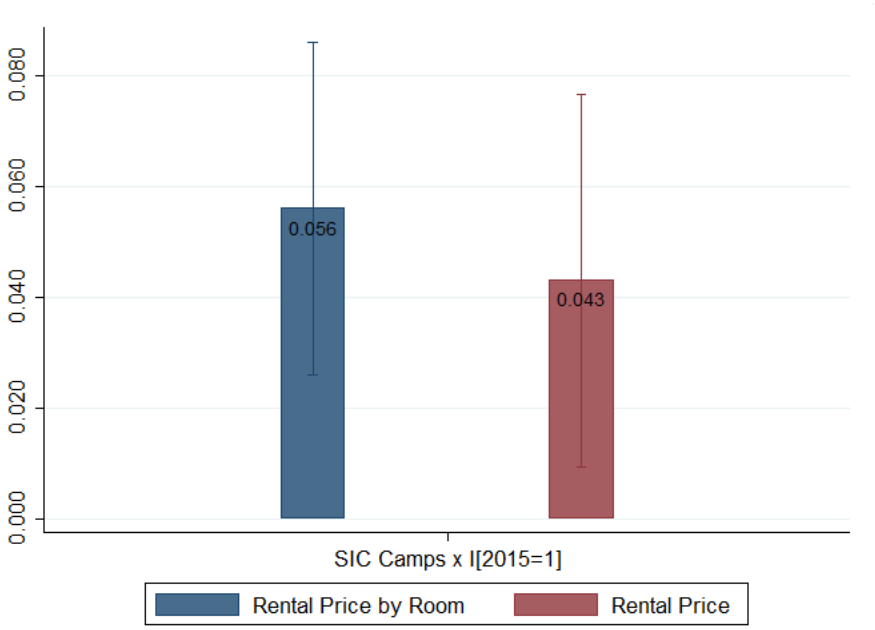
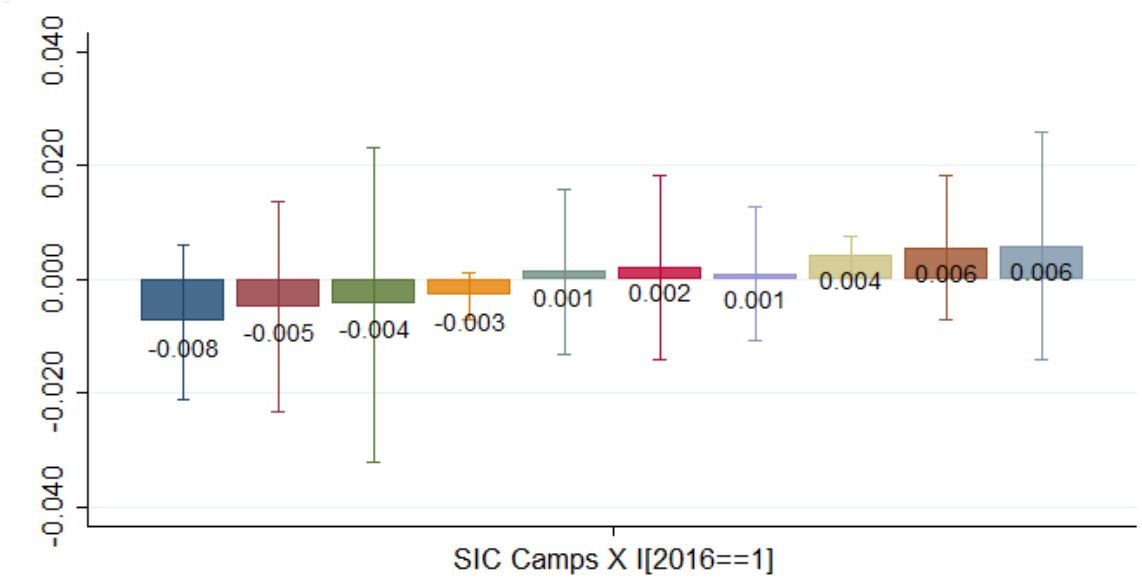


Figure XIII: Rental prices and refugee arrival in Jordan

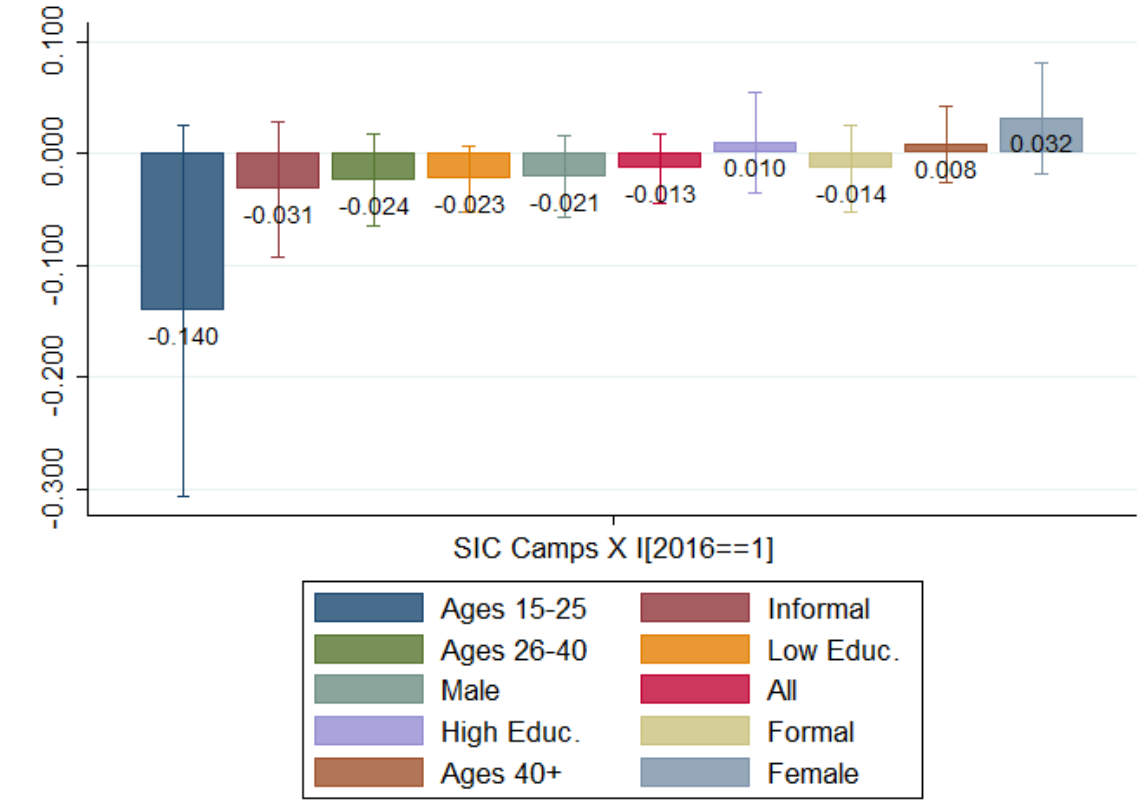


Notes: Each coefficient corresponds to a separate regression. Each regression includes fixed effects by governorate and year. Robust standard errors were used to construct the confidence intervals. Bars show 10% confidence intervals. *Data Source:* Housing and Population Census 2004 and 2015.

Figure XIV: Impact on refugee inflows on education and health access



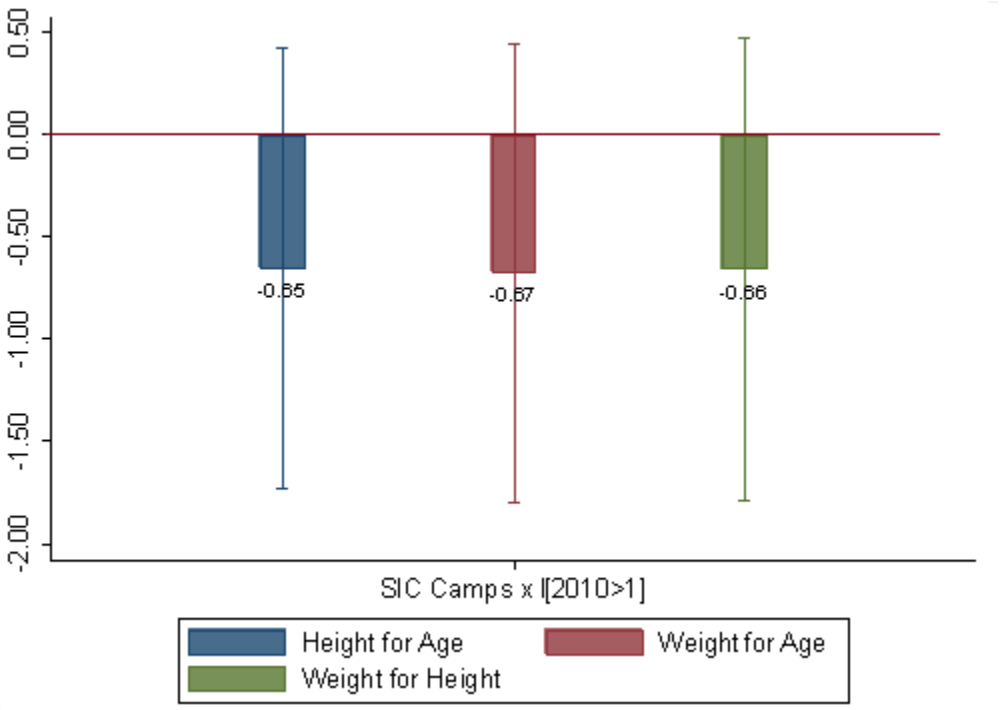
Panel A: Probability education enrollment



Panel B: Probability of having health insurance

Notes: Each coefficient corresponds to a separate regression. The sample only includes Jordan nationals ages 15 to 64. Each regression includes fixed effects by individual, year, and controls for age, years of education, marital status, gender, urban or rural location, mother and father level of education. Standard errors were clustered at the subdistrict level. There are 86 subdistricts in the sample. Bars show 10% confidence intervals. *Data Source:* JLMPS 2010 and 2016.

Figure XV: Impact on fefugee inflows on children's health



Notes: Each coefficient corresponds to a separate regression. The sample only includes Jordan children younger than 5 years of age. Additional controls include child's age and gender, mother's age and education level, household size, total number of children ever born, and number of children under 5 in each household. Standard errors clustered at the region-year level are presented in parentheses. *Data Source:* DHS 1997, 2002, 2007, 2009 and 2012.

Figure XVI: Event study: Impacts of refugee inflows in consumer expenditures

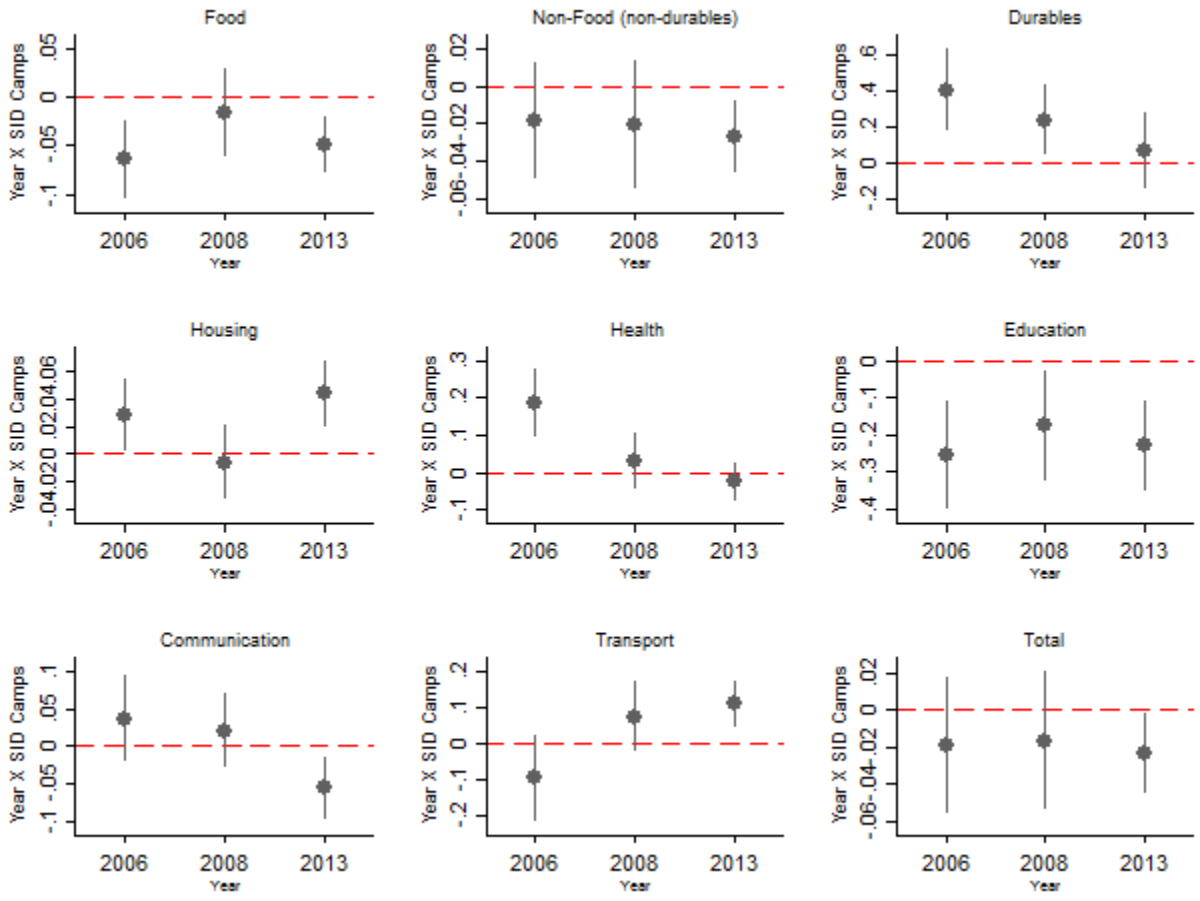


Figure XVII: Event study: Impacts of refugee inflows in satellite night light. Dependent variable: Log(Night Light)

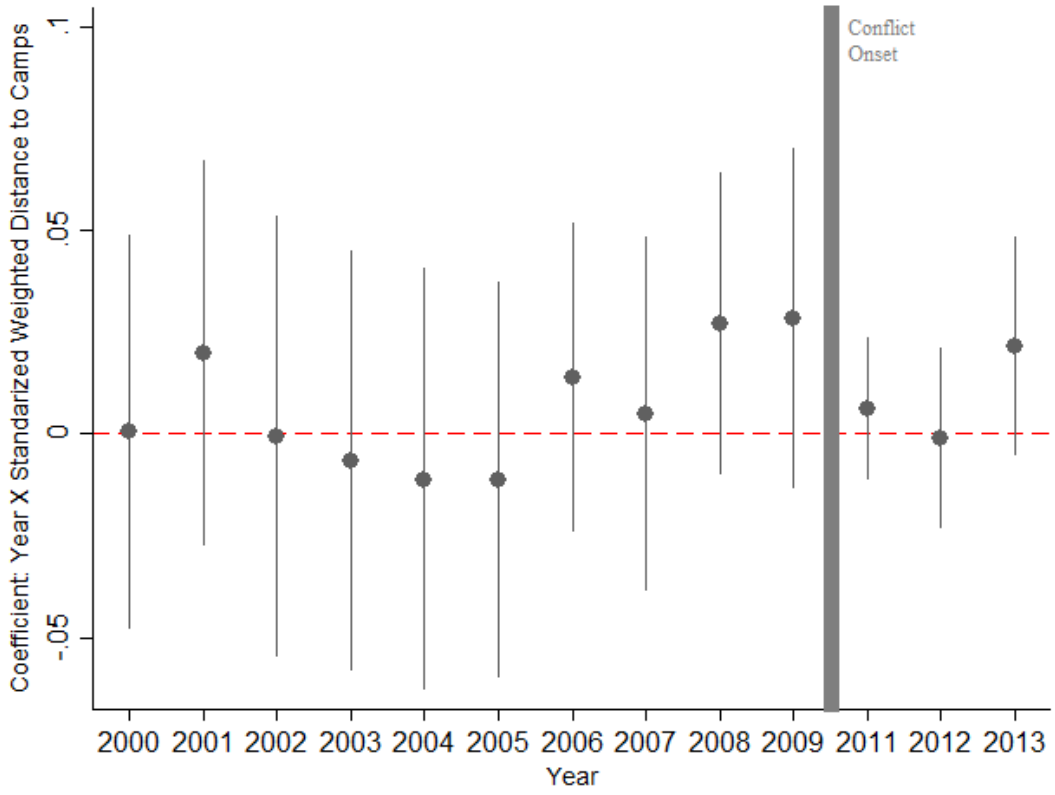
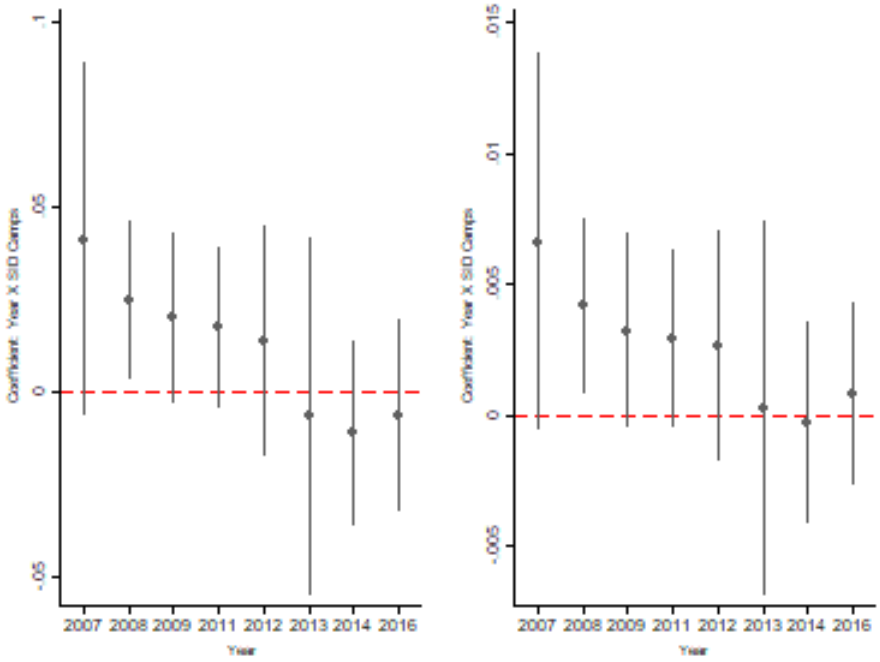


Figure XVIII: Event study: Impacts of refugee inflows in labor markets



Notes: Wages (left panel) and employment (right panel). *: wages were transformed using the inverse hyperbolic sine transformation (see Burbidge et al., 1988 and MacKinnon and Magee, 1990 for details). The coefficients can be interpreted as a log transformation on the dependent variable.

Appendix A: Table A1. Summary Statistics JMPLS Survey, 2010 and 2016

	2010			2016		
	Observations	**Average**	**St. Deviation**	**Observations**	**Average**	**St. Deviation**
Panel A: Local Labor Markets						
Wages	2,165,211	337.74	3504.66	2,390,045	328.09	981.14
Wages*	2,165,211	1.82	3.20	2,390,045	1.95	3.35
Hours Worked	2,165,211	12.68	21.51	2,390,045	13.01	22.93
Hours Worked*	2,165,211	1.25	2.01	2,390,045	1.28	2.00
Pr. Employment	2,155,766	0.28	0.45	2,346,566	0.33	0.47
Panel B: Education and Health Access						
Pr. Education Enrollment	2,158,948	0.40	0.49	2,390,045	0.18	0.39
Pr. Health Insurance	607,446	0.55	0.50	681,632	0.55	0.50
Panel C: Wealth Index						
Aggregate Wealth Index	2,165,211	0.07	0.87	2,385,306	0.33	0.788
Number of Assets	2,161,285	13.46	3.88	2,385,306	12.63	3.661
Necessary Assets	2,161,285	8.15	1.57	2,385,306	7.99	1.47
Luxury Assets	2,161,285	5.31	2.63	2,385,306	4.65	2.56
Rooms in Dwelling	2,161,867	3.69	1.22	2,385,676	3.59	1.102
Housing Area mt2	2,165,211	134.22	53.82	2,385,676	132.69	59.442
Pr. Good Quality Material for Floor	2,165,211	0.94	0.24	2,385,676	0.94	0.243
Panel D: Fertility and Marriage Decisions						
Age of First Marriage	940,837	22.15	4.94	1,365,568	23.70	5.45
Marriage Before 18 Years	940,837	0.25	0.43	1,365,568	0.17	0.37
Age of First Child Born	490,672	59.67	545.17	628,771	32.68	280.53
Number of Children	491,795	4.79	2.69	628,908	4.21	2.25
Panel E: Controls						
Age	2,165,211	33.52	13.87	2,390,045	33.80	13.94
Year of Education	2,158,948	9.22	4.22	2,389,383	10.99	3.86
Marital Status (Single)	2,165,211	0.31	0.46	2,390,045	0.43	0.49
Gender (Male)	2,165,211	0.50	0.50	2,390,045	0.51	0.50
Urban	2,165,211	0.76	0.43	2,390,045	0.89	0.31
Mother Level of Education	2,162,471	2.27	1.43	2,355,684	2.25	1.43
Father Level of Education	2,162,859	2.67	1.51	2,366,083	2.61	1.53

*Notes:** hours worked and wages were transformed using the inverse hyperbolic sine transformation.

Table A.1: Appendix A: Table A2. Summary Statistics Household Expenditure and Income Survey, 2006 and 2008

	2006			2008		
	Obs.	**Average**	**St. Deviation**	**Obs.**	**Average**	**St. Deviation**
Panel A: Expenditures						
Food	899,416	2424.79	2000.66	990,297	3210.85	1852.15
Non-Food	899,416	3652.78	3014.32	990,297	3808.29	3239.45
Durables	527,594	710.39	2455.39	602,579	571.16	1979.18
Housing	899,416	1091.55	1918.27	990,297	1265.46	1078.10
Health	824,591	222.42	678.23	956,586	166.60	512.41
Education	656,010	621.11	1399.00	682,786	572.37	1228.26
Communication	885,628	830.34	786.63	983,111	1078.61	1010.15
Transport	400,798	784.41	2344.67	458,310	696.82	2189.54
Total	899,416	7417.77	5953.37	990,297	8447.26	5961.08
Panel B: Income						
Gross Wages	656,066	3824.42	3403.12	733,999	4795.39	4082.04
Gross Wages*	656,066	8.69	0.75	733,999	8.93	0.71
Net Wages	656,066	3553.49	3081.69	733,999	4445.50	3780.33
Net Wages*	656,066	8.62	0.73	733,999	8.86	0.69
Self-Employment	313,848	2803.42	11985.86	343,127	3726.46	11113.35
Rental and Property	899,416	1168.66	3512.31	990,297	1285.68	4082.80
Transfers	899,416	1378.79	1777.78	990,297	1606.80	1984.90
Total	899,416	6278.09	9848.92	990,297	7694.17	9369.91
Panel C: Controls						
N. Household Member	899,416	5.80	2.48	990,297	5.60	2.43
N. Males in the HH.	899,416	2.96	1.69	990,297	2.83	1.63
N. Females in the HH.	899,416	2.84	1.56	990,297	2.77	1.53
N. Individuals under 14	899,416	1.99	1.80	990,297	1.86	1.76
N. Individuals higher 65	899,416	0.22	0.51	990,297	0.22	0.51
Urban	899,416	0.84	0.37	990,297	0.83	0.38
N. Income Earners	899,416	1.32	0.96	990,297	1.30	0.94
Age	899,416	48.19	14.05	990,297	47.99	14.11
Gender (Male)	899,416	0.89	0.32	990,297	0.88	0.32
Marital Status	899,416	2.29	0.90	990,297	2.28	0.90
Education Level	899,416	2.53	1.33	990,297	2.61	1.38
Source of Income	899,416	22.26	7.56	990,297	23.07	7.77
Main Activity of HH. Head	899,416	2.34	1.94	990,297	2.32	1.91

*Notes:** hours worked and wages were transformed using the inverse hyperbolic sine transformation.

Table A.2: Appendix A: Table A3. Summary Statistics Household Expenditure and Income Survey, 2010 and 2013

	2010			2013		
=	**Obs.**	**Average**	**St. Deviation**	**Obs.**	**Average**	**St. Deviation**
Panel A: Expenditures						
Food	1,088,392	3584.81	2181.03	1,172,605	3548.28	2044.82
Non-Food	1,087,652	4458.86	4477.25	1,172,605	4820.81	3544.71
Durables	665,201	959.05	6979.35	608,313	744.15	1901.61
Housing	1,088,392	1493.99	1411.29	1,172,605	1869.14	1369.11
Health	1,067,516	242.37	958.06	1,108,584	199.61	552.55
Education	724,266	767.25	1519.77	762,653	900.23	1695.15
Communication	1,083,581	1076.84	937.45	1,167,732	328.33	259.16
Transport	602,027	1121.75	6998.65	1,128,771	1563.69	1884.01
Total	1,088,392	9858.98	10422.95	1,172,605	10333.54	6090.59
Panel B: Income						
Gross Wages	772,090	5295.50	4201.20	855,586	6203.05	5038.43
Gross Wages*	772,090	9.00	0.81	855,586	9.17	0.75
Net Wages	772,090	4868.13	3776.60	855,586	5777.08	4647.31
Net Wages*	772,090	8.93	0.79	855,586	9.10	0.74
Self-Employment	393,065	3989.32	13741.25	290,245	3176.41	6289.19
Rental and Property	1,088,392	1671.91	3734.70	1,172,605	1798.59	2713.64
Transfers	1,088,392	1918.62	2833.18	1,172,605	2200.71	2848.73
Total	1,088,392	8736.55	11059.21	1,172,605	9268.54	7376.53
Panel C: Controls						
N. Household Member	1,088,392	5.39	2.30	1,172,605	5.08	2.14
N. Males in the HH.	1,088,392	2.66	1.53	1,172,605	2.55	1.47
N. Females in the HH.	1,088,392	2.74	1.46	1,172,605	2.53	1.39
N. Individuals under 14	1,088,392	1.75	1.70	1,172,605	1.60	1.62
N. Individuals higher 65	1,088,392	0.28	0.56	1,172,605	0.26	0.54
Urban	1,088,392	0.83	0.37	1,172,605	0.82	0.38
N. Income Earners	1,088,392	2.78	1.51	1,172,605	2.39	1.16
Age	1,088,392	49.22	14.57	1,172,605	49.26	14.48
Gender (Male)	1,088,392	0.86	0.35	1,172,605	0.86	0.34
Marital Status	1,088,392	2.31	0.95	1,172,605	2.33	0.97
Education Level	1,088,392	2.51	1.32	1,172,605	2.70	1.41
Source of Income	1,088,392	23.04	8.31	1,172,605	23.04	8.14
Main Activity of HH. Head	1,088,392	2.51	1.99	1,172,605	2.38	1.89
Panel D: Additional Controls - 2010						
Population Density	1,088,392	363.55	229.35	n/a	n/a	n/a
Night Light Density	1,088,392	14.90	11.17	n/a	n/a	n/a
Index of Econ. Conditions	1,088,392	2.09	0.15	n/a	n/a	n/a
Index of Education	1,088,392	1.91	0.09	n/a	n/a	n/a
Index of Housing Quality	1,088,392	2.25	0.18	n/a	n/a	n/a
Index of Service Coverage	1,088,392	2.32	0.17	n/a	n/a	n/a

*Notes:** hours worked and wages were transformed using the inverse hyperbolic sine transformation.

Table A.3: Appendix A: Summary Statistics Childs Health Outcomes, DHS 1997, 2002 and 2007

	1997			2002			2007		
	Obs.	**Average**	**St. Deviation**	**Obs.**	**Average**	**St. Deviation**	**Obs.**	**Average**	**St. Deviation**
Height for Age	5,676	1.18	12.97	4,904	0.45	9.73	5,152	14.73	35.86
Weight for Age	5,676	1.29	12.95	4,904	0.59	9.71	5,152	14.80	35.81
Weight for Height	5,676	1.63	12.91	4,905	0.94	9.67	5,152	15.01	35.73
Controls									
Child Age	6,260	2.00	1.40	5,698	1.98	1.42	5,168	2.00	1.42
Child Gender (Male)	6,466	0.52	0.50	5,851	0.51	0.50	5,259	0.50	0.50
Mother's Age	6,466	29.82	6.14	5,851	30.28	5.91	5,259	30.49	6.24
Mother's Education Level	6,466	1.98	0.79	5,851	2.08	0.70	5,259	2.17	0.65
Household Size	6,466	7.36	3.48	5,851	6.78	2.93	5,259	6.27	2.57
N. Children (5 or Less)	6,466	2.24	1.11	5,851	1.96	0.98	5,259	1.92	0.93
Total Children Ever Born	6,466	4.41	2.73	5,851	4.05	2.35	5,259	3.75	2.16

Table A.4: Summary Statistics Childs Health Outcomes, DHS 2009 and 2012

	2009			2012		
	Obs.	**Average**	**St. Deviation**	**Obs.**	**Average**	**St. Deviation**
Height for Age	4,710	8.66	28.55	6,357	0.93	10.83
Weight for Age	4,710	8.81	28.50	6,357	0.93	10.83
Weight for Height	4,710	9.01	28.43	6,357	1.13	10.80
Controls						
Child Age	4,723	1.96	1.39	6,668	2.08	1.40
Child Gender (Male)	4,830	0.53	0.50	6,825	0.51	0.50
Mother's Age	4,830	30.58	6.15	6,825	30.89	6.24
Mother's Education Level	4,830	2.23	0.64	6,825	2.21	0.63
Household Size	4,830	6.01	2.20	6,825	6.26	2.68
N. Children (5 or Less)	4,830	1.91	0.89	6,825	1.94	1.03
Total Children Ever Born	4,830	3.66	2.02	6,825	3.65	2.04

Appendix B: Robustness Test: Syrian Pre-settlements 2004

Figure A.1: Share of Syrian pre-settlements (% Pop, 2004 Census), governorate variation

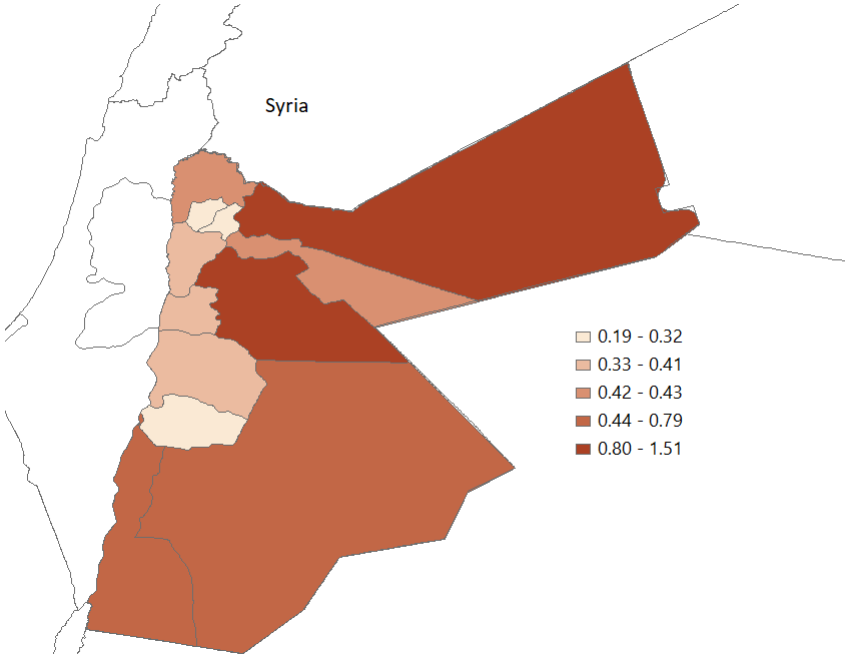


Table A.1: Effects of Refugee Inflows in Consumer Expenditures and Income

Dependent Variable in *logs*	Food	Non-Food (non-durables)	Durables	Housing	Health	Education	Commun.	Transp.	Total
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Syrian Pre-sett. × I[2010>1]	-0.014	-0.040	-0.747***	0.132***	-0.020	-0.061	-0.191***	0.266***	-0.015
	(0.076)	(0.036)	(0.221)	(0.042)	(0.152)	(0.167)	(0.059)	(0.079)	(0.053)
R-squared	.319	.435	.0606	.48	.124	.275	.483	.235	.429
Observations	4,150,710	4,149,970	2,403,687	4,150,710	3,957,277	2,825,715	4,120,052	2,589,906	4,150,710
Variables in *logs*	Gross Wages*	Net Wages*	Self-Employ.	Rental/ Prop.	Transfers	Total			
	(1)	(2)	(3)	(4)	(5)	(6)			
Syrian Pre-settl.× I[2010>1]	-0.013	-0.026	-0.213	0.169***	-0.101	-0.036			
	(0.054)	(0.047)	(0.180)	(0.049)	(0.094)	(0.027)			
R-squared	.444	.443	.272	.504	.448	.455			
Observations	3017741	3017741	1336909	3086145	4089236	4150710			
Controls for all Panels									
Governorate FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Additional Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

*Notes:** hours worked and wages were transformed using the inverse hyperbolic sine transformation.

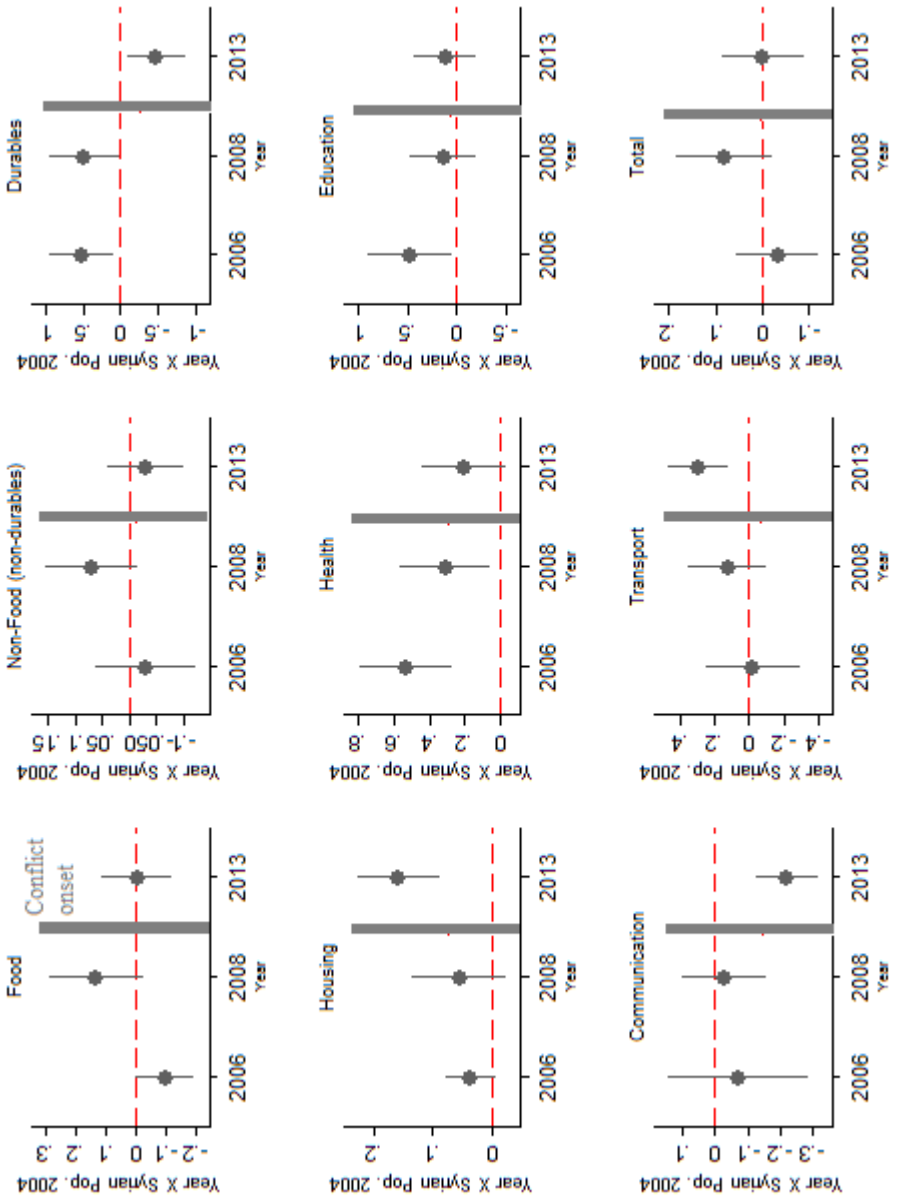


Figure A.2: Event Study: Impacts of Refugee Inflows in Consumer Expenditures