Refugee-Host Proximity and Market Creation in Uganda

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(Original version submitted November 2020; final version accepted July 2021)

ABSTRACT Many refugees remain for long time in host countries and to assess their impact on the welfare of local communities is essential for policy design. We focus on Uganda, a country that hosts the largest number of refugees in SSA. We analyse whether and to what extent the proximity to refugees increases the welfare and the level of economic activity of hosting-community households by generating incentives for economic exchanges. To measure the potential of interaction we use the distance between hosting-community and refugee households and we test the robustness of our results by implementing different approaches. We conclude that, beyond the possible effects due to the benefits provided by the agencies caring for refugees, the direct interaction between them and the hosts generates an increase in both the level and the types of the economic activity carried out by the hosts. However, the market creation is limited to a radius of approximately 5 kilometres.

KEYWORDS: Forced migration; refugees; household data; distance; market creation

1. Introduction

Worldwide, the number of refugees has substantially increased in the recent past, reaching almost 26 million in 2019. The majority of refugees stays in low- and middle-income countries and remains in the host communities for a long period. Uganda hosts one of the biggest refugee community, currently more than 1.4 million (UNHCR, 2021), in 31 settlements within 13 districts.

In low- and middle-income countries, the impact of refugees (concentrated mainly in deprived areas) on local communities is open to question. They may compete with host communities for the use of scarce resources like land or water, contribute to the depletion of the environment, and may cause price increases, especially for staple goods. Nonetheless, the presence of refugees can improve the economic situation of host communities in two interrelated ways. First, benefits and services provided to refugees may spill over to local communities as national and international assistance may indeed target both. Second, refugee communities may create job and market opportunities for host communities because of the increased demand for goods and services and because of the economic activities carried out by refugees.

Several papers have addressed the issue of the impact of refugee presence on agricultural prices and host welfare, but only Alix-Garcia et al. (2018) and Kreibaum (2016) have looked at...
this impact with a non-descriptive approach. Alix-Garcia et al. (2018) find that proximity to the Kakuma camp in Kenya exerts a positive effect on economic activity and consumption. In the case of three Southern districts of Uganda, Kreibau (2016) shows that the presence of refugees tends to increase the consumption of host communities and their access to private primary schools.

Nevertheless, these studies, along with others discussed in the next section, do not identify the channels through which refugee presence generates the observed increase in welfare. Our paper aims to contribute to this strand of the literature by looking at the creation of market opportunities in the proximity of refugee settlements in Uganda.

Because of the high transport costs in the rural areas where hosting-community households live, exchanges are severely limited by distance and might be favoured by an increase in the proximity to other households. Agglomeration externalities are well documented in the spatial economics literature, both in developed (see e.g. Hanson, 2001) and in developing (see e.g. Fafchamps, 2012; Sharma, 2016) economies. Furthermore, there is evidence that improving access to markets positively affects the economic outcomes of concerned communities (e.g. Emran & Hou, 2013). Our contribution to the existing literature is to assess whether and to what extent the proximity to refugees increases the welfare and the level of economic activity of hosting-community households by generating incentives for economic exchanges. An issue that, as it will be discussed in more details in the next section, has not been addressed in the literature.

The results of the existing literature are drawn mainly from a comparison between host communities living close or far from the refugee settlements. Therefore, the observed improvement in the host welfare may be driven by several mechanisms. It is possible, for example, that the creation of (large) refugee camps might improve access to far away markets through improved infrastructures, or that the availability of services provided both to refugees and hosts improves the situation of the latter, or that the supply of goods provided by the national and international agencies affects the market prices.

As the data we use for our analysis refer to host households all relatively close to refugee settlements, we can suppose that the aforementioned mechanisms are common to the households in our sample, and we show some evidence that indeed the distance to refugees does not affect hosting-community households’ probability to access a wide set of services and infrastructure. For that reason, we conclude that the effect we find is driven by the direct interaction with refugees, rather than the presence of a refugee settlement.

However, we do not have a control group to assess effects that are independent from the distance between hosts and refugees in the camp proximity. Therefore, we are unable to draw conclusions about the overall effect of the presence of the refugees on the host communities of Uganda.

To evaluate the effect of proximity to refugees on market creation, we relate several hosts’ economic outcomes to the distance to the nearest refugee household. The distance between host and refugee households can be considered, to a large extent, as exogenous. The allocation of refugees to the different settlements and to specific plots within each settlement is regulated by the Government of Uganda in collaboration with the UN Refugee Agency (UNHCR) – according to criteria like the county of origin, ethnicity, needs’ assessment, and service availability. Refugees are free to leave the settlement, but at the cost of losing the benefits of international assistance. Of course, also hosting-community households might have changed the place of their dwelling for reasons correlated with the outcome of interest. For example, more entrepreneurial hosts could have moved closer to the newly arrived households to exploit the trade potential, thus making our estimates biased. Most of the households in our sample (more than 70 per cent) did not change their residence and very few moved following the larger inflows of refugees. However, we run a series of robustness tests excluding from the sample households who moved to their current location after the larger inflows of refugees in the area begun.
Finally, as a robustness test for possible biases related to the OLS method (mainly due to measurement errors), we present also the results of the IV method.

To anticipate some of the results, we find some positive effects on food expenditure: this appears to be mainly due to the larger participation of host households in paid employment and to the consequent increase in wage income. On average, the reduction of the distance to refugee households by about 1 kilometre generates an increase in hosts’ wage income of about 6 per cent. Furthermore, wage employment increases mainly in agricultural and non-agricultural private sectors. There does not appear to be any direct employment effect due to the labour demand from the camp activities.

Taken together, the results indicate that one of the channels through which the refugee presence increases hosts’ welfare is the direct interaction between the two communities. This increase is in both the level and the characteristics of the economic activity carried out by the hosts. However, the effects tend to be very localised: there is no impact on food expenditure and on waged employment if the distance exceeds about 6 kilometres and about 4 kilometres respectively.

The paper is organised as follows. Section 2 provides a review of the related literature. Section 3 depicts the Ugandan institutional setting and the dispersal policy of refugees. Section 4 describes the empirical analysis and the data used with it. Sections 5 and 6 show the main results and test their robustness. Section 7 presents further results and Section 8 concludes.

2. Literature review

The economic impact of refugees’ presence on host communities is far from univocal, but the vast majority of studies leans towards a positive or non-negative impact. Simulations in Rwanda (Taylor et al., 2016) indicate that refugees can create positive income spillovers for hosting-community households. Taylor et al. (2016) find that the presence of refugees increases total real income within a 10-km radius by significantly more than the amount of the aid the refugees receive. Alix-Garcia et al. (2018) show that refugee inflows enhance economic activity in the areas very close to refugees’ camps in Kenya. They also show an increase in food consumption of local communities. Maystadt and Verwimp (2014) find on average a positive impact on host households’ welfare as measured by per adult equivalent consumption, albeit with heterogeneous effects across population groups.

Other studies show less positive results. Morales (2018) finds that a conflict-induced increase in population in Colombia leads to a short-run negative impact on wages of low-skilled population, but subsequent out-migration from the main receiving municipalities helps to mitigate this effect. Also Tumen (2016) finds a small but statistically significant informal employment losses among natives in Turkey in the two years following the mass inflows of refugees from Syria, while Fallah et al. (2019) do not identify any significant impact of Syrian refugees on natives’ labour market outcomes in Jordan. Alix-Garcia and Saah (2010) find a significant increase in the prices of some agricultural goods and a decrease in the price of aid-delivered goods in Tanzania. Depeetra-Chauvin and Santos (2018) look at the impact of refugees on the real estate market in Colombia and find that low-income rental prices increase and high-income rental prices decrease.

In the case of Uganda the attention has focused mainly on consumption. The work of Kreibaum (2016) indicates that the presence of refugees in the Southwestern districts appears to have a positive effect on hosting-community households’ consumption and primary school enrolment.

All the aforementioned studies look at the impact of refugees’ presence on some aggregate indicators of welfare, mainly consumption. The mechanisms through which they generate such an impact have not been investigated.

The literature on refugees’ impact on hosting-communities is still tentative and the existing results can be improved in two ways. The coverage of the case-studies can be extended and – more
importantly – the relevance of the different channels through which refugees’ presence can affect host households’ welfare can be further analysed.

The question of whether the different channels mentioned in the introduction are relevant and what is their relative impact remains open. Nonetheless, to ascertain whether and to what extent the presence of refugees increases directly the host households’ level of economic activity has obvious policy implications. Should this not be the case, then the observed increase in consumption and other indicators could be attributed to the assistance offered by the agencies, with self-evident implications for sustainability.

3. The institutional setting and the refugee dispersal policy

Uganda hosts the biggest refugee community in Sub-Saharan Africa (SSA), with more than one million refugees, mainly originating from South Sudan, Burundi, and the Democratic Republic of the Congo (UNHCR, 2021). The political uncertainty and the hostilities in the bordering countries have been the main push factors for refugees who arrived in Uganda during the past ten years. In particular, the conflict in Kivu – in the Eastern Democratic Republic of the Congo, started in 2009 – and the civil war in South Sudan – started at the end of 2013 – led to the arrival of unanticipated flows of Congolese and South Sudanese within a short period (UNHCR, 2021). In the most recent years, the number of refugees remained constant (see Figure 1).

As mentioned, the majority of the refugees remain in the official settlements in order not to lose the benefits granted by national and international agencies. The allocation of the refugees in the different settlements is managed by UNHCR in close collaboration with the Office of the Prime Minister (OPM). Upon arrival in Uganda, refugees are received by the UNHCR and they are registered to understand their ethnic and socio-economic background and the kind of assistance they need and are allocated in the settlements administrated by OPM. As a result, the refugees from South Sudan and Democratic Republic of the Congo are mainly settled in the Northern and Southern districts respectively.

Figure 1. Refugee inflows in Uganda (2000–2020).
Notes: Authors’ elaboration on UNHCR data. The red line refers to the starting year of the household survey.
Upon arrival in the settlement, the refugees are allocated a plot\(^4\) and given an initial shelter package for building a temporary shelter, in addition to essential non-food items. Each settlement is organised in zones (equivalent to a parish in the national governance structure), and each zone is composed of blocks, the equivalent of villages.

After the allocation, the refugees can be re-allocated to a different settlement because of the following reasons: (i) family reunification; (ii) request to UNHCR if they feel uncomfortable; (iii) tension/violence. Finally, the refugees (entire family or single household members) are free to decide to leave the settlement for migrating to the urban areas of Uganda or go back to the country of origin.

4. Data and empirical analysis

4.1. The household survey

We use a recent survey carried by the Food and Agriculture Organization of the United Nations (FAO), in coordination with OPM, in Northern and Southwestern Uganda. The objective of the survey is to provide a comprehensive assessment of the living conditions of the refugees and the host communities (FAO & OPM, 2018; FAO and OPM, 2019).\(^5\) This is one of the few surveys that contains detailed information on both refugee and host households.

![Figure 2. Settlements in Uganda.](image)

*Notes*: Authors’ elaboration on UNHCR data. Red circles correspond to sampled settlements. Circles are proportional to settlements’ populations in March 2018.
The following map (Figure 2) shows the location and the size of the refugee settlements in Uganda. The survey covers the following settlements: Palabek settlement in Lamwo district, Palorinya in Moyo, Bidibidi in Yumbe, six settlements in Adjumani, Imvepi and Rhino in Arua, Kyaka II in Kyeggwa, the namesake settlement in Kiryandongo and Rwamwania in Kamwenge. The surveyed settlements host around 80 per cent of the overall refugees.6

The sample consists of 3,799 households, including both refugees (2,170 households) and hosts in the proximity of the settlements (1,632 households). Households are selected using a stratified two-stage cluster sampling method. Within each district, the Primary Sampling Units (PSU) are the settlement blocks (for refugee households) or the villages close to the settlement (for host households), with the probability of selection proportional to the size of the settlement or sub-county. Households are the Second Sampling Unit (SSU) randomly selected from either a list of households provided by the local authority or by walking through the village or settlement blocks.

The fieldwork was implemented in December 2017 in the Northern districts and in March 2018 in the Southwestern ones. The data collection was carried out by employing Computer Assisted Personal Interviewing (CAPI) technologies and digital tablets.

The same questionnaire was utilised in all phases of data collection. The survey collects information on the socio-demographic characteristics of the households, food security – including a detailed food consumption module, and well-being – shocks, assistance, perceived resilience capacity, coping strategies and aspirations, access to basic services, employment, and agricultural and livestock production.

The household data are geo-referenced7 and this allowed us to exploit the role of the distance between refugee and host households living close to the same settlement as discussed in the next section.

4.2. The empirical strategy

We rely on measures of proximity as proxies for the potential (economic) interaction between hosts and refugees. In particular, we use the distance of each host to all the refugee households living in the closest settlement. The distance is calculated as the earth-arc distance between two points – based on GPS coordinates. Table 1 presents different measures of the distance: minimum, mean, and median. The minimum distance refers to the distance to the closest refugee household, while mean and median distance is computed for all the refugee households in the closest camp. In our preferred estimates we use the minimum distance, but results are robust also to the use of the other measures of distance.8 In Table 1, we present the distance of the host households also to the administrative centre of the refugee settlement, that, as we will discuss, we use as an instrument for a robustness test.

|                      | Mean | St. deviation | Min | Max |
|----------------------|------|---------------|-----|-----|
| Distance to refugees (km) |      |               |     |     |
| Min                  | 1.74 | 1.72          | 0.00| 11.42|
| Mean                 | 10.50| 4.99          | 2.14| 22.82|
| Median               | 10.65| 5.58          | 2.00| 29.08|
| Distance to settlement (km) |      |               |     |     |
| Min                  | 9.78 | 8.04          | 0.12| 39.57|
| Mean                 | 12.61| 7.58          | 0.23| 39.57|
| Median               | 12.78| 7.72          | 0.23| 39.57|
| Observations         | 1,572|              |     |     |

Notes: Authors’ elaboration on FAO data. Summary statistics are computed for hosting-community households. For the same summary statistics computed for refugee households, please see Table C1 in Annex C. The distances to the settlement are computed with respect to administrative centre.
On average, the hosting-community households have at least one refugee household at a distance of 1.7 kilometres, with a range that goes from immediate proximity to about 11 kilometres. The (average) distance to all the refugee households in the settlement is of course higher, with a mean of 10 kilometres and a range from 2 to 22 kilometres. Similar values are obtained for the median distance. As discussed, previous research has shown that the effects of the refugees on the economic outcomes of the hosting communities, if any, tend to fade away rather quickly with the increase in distance. Therefore, the range of observed distance between the households in our sample looks well suited to identify any impact due to the proximity among communities.

To elicit the effect of the interaction with refugees on several hosting households’ economic outcomes, we relate them to the distance to refugees using a linear regression model. Our baseline specification is the following:

\[ Y_{ij} = \alpha + \beta \cdot Dist_{ij} + \gamma \cdot X_i + \delta_j + \epsilon_{ij} \]  

where \( Y_{ij} \) is the observed outcome of interest (detailed below) of the hosting-community household (or individual belonging to household) \( i \) living close to settlement \( j \). \( Dist_{ij} \) is the distance of household \( i \) to any refugee household living in settlement \( j \). \( X_i \) is a vector of household or individual (as applicable) controls, including the number of male and female adults, a dummy for female household head, household head’s age and education, or individual’s sex, age, and education (summary statistics are presented at the bottom of Table 2). \( \delta_j \) is the settlement fixed effect and \( \epsilon_{ij} \) is the idiosyncratic error term. Therefore, \( \beta \) measures the effect of being exposed to the presence of refugee households on the outcome of interest. Because the greater the distance the lesser the exposure, we expect \( \beta \) to be negative if proximity affects the outcomes of host households.

Our empirical specification can arise some concerns about the identification of the effect of the proximity to refugees on hosts’ economic outcomes. First, it can be argued that refugees and hosts’ locations are endogenous to the outcome of interest. This would be the case if refugees could decide to settle as near as possible to the most propertied and productive hosting-community households to benefit from interactions with them. Conversely, hosting-community households could move to live close to the most populated part of the settlements.

Nonetheless, the socio-economic context in which the analysis is conducted admits little margin for such a dynamic to occur. As explained in Section 3, upon arrival refugees are allocated to a plot

| Table 2. Hosting-community households’ characteristics and distance to refugees |
|-----------------------------------------------|
| (1) Female adults | (2) Male adults | (3) Avg. edu. of adults | (4) Avg. edu. of fem. adults | (5) Avg. edu. of male adults | (6) Head’s age | (7) Female head | (8) De lure female head |
|---------------------|----------------|------------------------|-----------------------------|-----------------------------|----------------|-----------------|-----------------------|
| Dist. to refugees (min) | -0.0254 | -0.015 | -0.126 | -0.125 | -0.120* | -0.023 | -0.000 | -0.000 |
| Observations | 1,572 | 1,572 | 1,572 | 1,499 | 1,479 | 1,572 | 1,572 | 1,572 |
| R-squared | 0.036 | 0.065 | 0.039 | 0.049 | 0.050 | 0.041 | 0.250 | 0.221 |
| Controls | No | No | No | No | No | No | No | No |
| Settlement FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mean | 1.755 | 1.761 | 5.532 | 5.564 | 5.535 | 44.241 | 0.300 | 0.292 |
| St. deviation | 1.288 | 1.156 | 2.799 | 3.406 | 3.665 | 14.704 | 0.459 | 0.455 |
| Min | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 |
| Max | 10 | 9 | 15 | 15 | 15 | 95 | 1 | 1 |

Notes: Authors’ elaboration on FAO data. Summary statistics are computed for the full sample of hosting-community households. Errors are clustered at the settlement level. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
within the settlement area and – if they want to continue living in the settlement in order to receive the support – they must reside in the assigned area. Furthermore, more than 70 per cent of the sampled host households’ heads never moved from their current residence and about 95 per cent did not move within the two years preceding the survey, i.e. following the large refugee inflows of 2015.

Second, households living close to refugees can self-selected based on characteristics that are correlated with the outcomes of interest. As a further test to validate our empirical strategy, we run a regression model of hosts’ characteristics on the distance to refugees. Without data relative to the period preceding the arrival of the refugees, we used only hosts’ characteristics that are unlikely to be affected by the refugee presence: household head gender, age, and education. As shown in Table 2, hosting-community households’ characteristics do not significantly correlate with the distance to refugee households. 9

Third, one last concern is that the effect of the proximity to refugees can be confounded by the presence of the settlements and of the services related to them, like markets, transports and other infrastructures. Nevertheless, the hosting-community households are all sampled near the settlements and they have all access to the same services. Table 3 reports the coefficients of linear regressions of hosts’ distance to different services on the distance to nearest settlement’s administrative centre. 10 None of them are significant and so we cannot reject the hypothesis that access to services is not affected by the distance to the settlement. Therefore, the effect of the proximity to refugees we are going to estimate does not appear to be confounded by the presence of the other services.

| Table 3. Hosting-community households’ access to services (distance to services) |
|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| (1) Primary school              | (2) Secondary school            | (3) Public hospital             | (4) Private hospital            | (5) Pharmacy                    | (6) Police                       | (7) Local council                |
| Dist. to settlement             | 0.018                           | 0.056                           | 0.029                           | 0.037                           | 0.006                           | 0.034                           | 0.006                           |
| Observations                    | (0.010)                         | (0.040)                         | (0.031)                         | (0.062)                         | (0.017)                         | (0.022)                         | (0.005)                         |
| R-squared                       | 1.572                           | 1.453                           | 1.560                           | 951                             | 1,499                           | 1,549                           | 1,571                           |
| Controls                        | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             |
| Settlement FE                   | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             |
| (8) Church                       | (9) Livestock market            | (10) Agriculture market         | (11) Trade market               | (12) Bank                       | (13) Transport                   | (14) District chief town         |
| Dist. to settlement             | -0.001                          | -0.070                          | 0.006                           | -0.002                          | 0.063                           | -0.003                          | 0.115                           |
| Observations                    | (0.005)                         | (0.174)                         | (0.071)                         | (0.009)                         | (0.042)                         | (0.012)                         | (0.259)                         |
| R-squared                       | 1,572                           | 738                             | 1,001                           | 1,572                           | 1,492                           | 1,572                           | 1,572                           |
| Controls                        | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             |
| Settlement FE                   | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             | Yes                             |

Notes: Authors’ elaboration on FAO data. The distance to the services is expressed in kilometres and reported by the respondents, while the distance to the chief towns has been calculated by using the earth-arc distance between the hosts’ locations and the district chief town – based on GPS coordinates. Controls include the number of male and female adult members, female household head, household head’s age and years of education. Errors are clustered at the settlement level. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
Table 4. Household per capita food and non-food expenditure, and own-produced food consumption

|                        | (1) Food expenditure | (2) Non-food expenditure | (3) Own food consumption |
|------------------------|----------------------|--------------------------|-------------------------|
| Dist. to refugees (minimum) | −958.2***  
(258.1) | 362.9  
(293.3) | 161.1  
(476.7) |
| Observations           | 1,555                | 1,554                    | 1,553                   |
| R-squared              | 0.126                | 0.097                    | 0.096                   |
| Controls               | Yes                  | Yes                      | Yes                     |
| Settlement FE          | Yes                  | Yes                      | Yes                     |

Notes: Authors’ elaboration on the FAO dataset. Models in columns (1) and (2) refer to per capita expenditure in the last month. Model in column (3) refers to per capita own-produced food consumption in the last month. Controls include the number of male and female adult members, female household head, household head’s age and years of education. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

5. Impact of proximity on consumption and labour market outcomes

To assess the possible impact of proximity to refugees on host households’ welfare and economic activity, we consider a broad set of indicators (see Table A1 in Annex A). In presenting our empirical results, we first look at consumption expenditures (both food and other non-durable) then to different sources of income. We analyse both incomes from work (waged and casual) and indicators of the level of agricultural activity. The latter is a proxy of the income from agriculture that represents the main source of livelihood for the households in our sample.

Table 4 presents the results relative to the monthly per capita household expenditures for food and non-food non-durable goods. The estimates indicate a significant impact of proximity to refugees on hosts’ food expenditures, while non-food expenditures do not appear to be affected. The impact on food expenditures is economically significant as a decrease of 1 kilometre in the minimum distance between host and refugee households implies an increase of food expenditures of about 5 per cent at the mean of the minimum distance (1.74 km). As the communities around the refugee settlements are among the poorest and are characterised by a high level of food insecurity, it is not surprising to find no effect on non-food consumption.

Table 5. Household sources of income

|                        | (1) Waged labour | (2) Casual labour | (3) Transfers | (4) Crop | (5) Livestock products |
|------------------------|------------------|-------------------|--------------|----------|-----------------------|
| Dist. to refugees (minimum) | −5,175***  
(1,767) | 266.8             | −1,000          | 3,785     | −90.50                |
| Observations           | 1,541            | 1,538             | 1,543        | 1,538    | 1,545                 |
| R-squared              | 0.073            | 0.031             | 0.025        | 0.220    | 0.010                 |
| Controls               | Yes              | Yes               | Yes          | Yes      | Yes                   |
| Settlement FE          | Yes              | Yes               | Yes          | Yes      | Yes                   |

Notes: Authors’ elaboration on the FAO dataset. Models in columns (1) and (2) refer to annual monetary income from waged and casual labour respectively. Model in column (3) refers to other transfers received by the household, expressed in monetary terms. Models in column (4) and (5) refer to the monetary value of sales of crop and livestock products. Controls include the number of male and female adult members, female household head, household head’s age and years of education. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
To ascertain the source of the observed increase in food expenditure, we look at different components of the household income. Starting with labour income, we find that proximity to refugee households does increase a household’s total labour income. However, when we disaggregate total labour income by casual and wage income, we find that the increase is mainly due to the change in the latter (see Table 5). The effect on wage income is substantial as, at the mean, the reduction of the distance by about 1 kilometre generates an increase in wage income of about 6 per cent. Unfortunately, we do not observe wage rates and, therefore, we cannot ascertain whether the observed increase is due (more) to changes in employment or wages (but see below for estimates of changes in individual employment).

Refugees benefit from transfers of various kinds that are in most cases also extended to local communities. Even if there are no reasons a priori to assume that proximity does affect the probability of receiving such transfers, we tested for this possibility. Transfers from Government and International Agencies (columns (3) of Table 5) do not appear to depend on the proximity between hosts and refugees and, therefore, are not associated with the observed increase in expenditure.

We could not identify any effect of proximity to refugees on host households’ self-employment income both in agricultural and non-agricultural activities (results available on request). Also, the value of sales of crops and livestock products is not affected by the distance between refugee and host households. Therefore, the observed increase in consumption appears to be due mainly to the increase in wage income.

The observed increase in household income appears to be generated by an increase in waged employment coupled with a reduction in casual employment. As shown in columns (1) and (2) of Table 6, where we make use of individual data on work activities (see Table A2 in Annex A for the summary statistics), the closer the host household to the refugees the higher the probability that individuals belonging to it work as employees and lower the probability that they are involved in casual work. At the mean, a reduction of 1 kilometre in the distance to refugees decreases the probability of doing casual labour by about 1 per cent and increases the probability of working for a wage by 1 per cent.

The latter effect is heterogeneous across industrial sectors. Indeed, waged employment increases in the agricultural sector and the non-agricultural private sector. The effect on public employment is not significant (columns (3) in Table 6), indicating that the increase in waged employment is not due to the demand stemming, directly or indirectly, from the agencies supporting the refugees.

To identify the source of the increase of waged employment in the private sector, we looked at the probability of both host and refugee households to run an enterprise. The results are presented in Table 7. Proximity does not affect the probability that hosts run a non-agricultural enterprise, but it is positively correlated to the probability that refugees have an enterprise.

Table 6. Employment by type and sector

| OLS          | (1) Casual | (2) Waged | (3) Public | (4) Private | (5) Agriculture |
|--------------|------------|-----------|------------|-------------|----------------|
| Dist. to refugees (minimum) | 0.0130*** (0.00501) | −0.00994*** (0.00166) | −0.000344 (0.000226) | −0.00473*** (0.00138) | −0.00454*** (0.000803) |
| Observations | 5,856      | 5,856     | 5,856      | 5,856       | 5,856          |
| R-squared    | 0.013      | 0.018     | 0.003      | 0.013       | 0.010          |
| Controls     | Yes        | Yes       | Yes        | Yes         | Yes            |
| Settlement FE| Yes        | Yes       | Yes        | Yes         | Yes            |

Notes: Authors’ elaboration on the FAO dataset. Controls are gender, age, and years of education. Individuals under 14 years of age are excluded from the analysis. Errors are clustered at the household level. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
### Table 7. Probability of operating an enterprise

|                  | OLS                |
|------------------|--------------------|
|                  | (1) Hosting community | (2) Refugees |
| Dist. to refugees (minimum) | 0.00327            | −0.0143**    |
|                  | (0.00706)           | (0.00661)    |
| Dist. to hosts (minimum)      | −0.0143**          |              |
| Observations       | 1,572              | 2,018        |
| R-squared          | 0.042              | 0.026        |
| Controls           | Yes                | Yes          |
| Settlement FE      | Yes                | Yes          |

Notes: Authors’ elaboration on the FAO dataset. Controls include the number of male and female adult members, female household head, household head’s age and years of education. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

Therefore, it appears that the additional waged employment of the host households may be generated by small enterprises run by refugee households and that proximity increases the probability of being employed in them. This confirms the anecdotal evidence on job creation for Ugandan nationals through refugee enterprises (WB, 2019).

### 6. Robustness

As discussed earlier in the paper, we have good reasons to believe that the distance between host and refugee households is exogenous to our analysis. However, as a robustness check – and to take care of potential errors in measuring the distance – in this section we present the results of a 2SLS method.

Indeed, we cannot exclude that the data on households’ location are collected with imprecision and the use of an IV can alleviate any bias deriving from errors in geocaching locations.

When a *classical errors-in-variables problem* occurs – i.e. when a variable is measured with an additional error that is uncorrelated with its true value – the estimated coefficient is biased towards zero (see e.g. Klepper & Leamer, 1984). If this is the case, any instrument that is correlated with the true value of the variable, but uncorrelated with the error, leads to consistent estimates of the regression coefficient. Since in our case the measurement error is due to potential technical imprecision, and so uncorrelated with the true value of the distance, it is possible to use an IV to alleviate the attenuation bias due to measurement error.

Our instrument exploits the fact that there exists a requirement for refugees to live in assigned plots of land around the administrative centre of the settlement, so that we can use the hosts’ distance to the centre of the settlement as an instrument for the distance to refugees.

The instrument is defined as:

\[ Z_{ij} = \text{Dist}_{i,CAMP_j} \]  

where *CAMP* \(_j\) is the administrative centre of the refugee settlement \(_j\). Empirical results from the 2SLS method for hosts’ food expenditure, wage income and individual probability to be employed in salaried jobs are presented in Table 8. As expected, the magnitude of the effect increases when we take into account the measurement error.

Another concern for the consistency of our results is related to the fact that host households might have moved in response to the presence of refugees in the area and, possibly, chosen
However, hosts’ movements appear to be very limited: more than 70 per cent of our sample never moved and more than 90 per cent did not move in the five years preceding the survey.

Figure 3. Arrival of refugee households.

Notes: Authors’ elaboration on the FAO dataset. Years of household head’s arrival in the current place of residence are plotted on the horizontal axis, density for the total refugee households is plotted on the vertical axis.

Table 8. Food expenditure, wage income and waged employment (2SLS)

| IV     | (1) Food expenditure | (2) Wage income | (3) Waged employment |
|--------|-----------------------|-----------------|----------------------|
| Dist. to refugees (minimum) | −2.219*** | −11.501** | −0.0293*** |
| (713.8) | (5842) | (0.00823) | |
| Observations | 1555 | 1541 | 5856 |
| R-squared | 0.098 | 0.054 | 0.018 |
| Controls | Yes | Yes | Yes |
| District FE | Yes | Yes | Yes |
| F Stat | 107.79 | 111.78 | 79.46 |

Notes: Authors’ elaboration on the FAO dataset. Model in column (1) refers to per-capita food expenditure in the last month. Model in column (2) refers to household’s income from waged labour and model in column (3) refers to the individual probability to be employed in a salaried job. In the regressions at the household level, controls include the number of male and female adult members, female household head, household head’s age and years of education. In the regression at the individual level, controls are gender, age, and years of education. Individuals under 14 years of age are excluded from the analysis in column (3). In the latter, errors are clustered at the household level. The reported F Stat is the Kleinbergen-Paap rk Wald F Statistics. The first-stage regression output is shown in Table B1 in Annex B. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
Table 9. Robustness analysis. Households who did not move recently (OLS)

|                      | (1) All sample | (2) More than 2 years | (3) More than 5 years | (1) All sample | (2) More than 2 years | (3) More than 5 years | (1) All sample | (2) More than 2 years | (3) More than 5 years |
|----------------------|----------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|----------------|-----------------------|-----------------------|
| District to refugees (minimum) | -958.2*** | -897.5*** | -918.1*** | -5,175*** | -4,978*** | -4,907*** | -0.00976*** | -0.00995*** | -0.0105*** |
| Observations         | (258.1)       | (257.5)               | (264.0)               | (1,767)       | (1,760)               | (1,748)               | (0.00167)    | (0.00169)             | (0.00171)             |
| R-squared            | 0.126          | 0.119                 | 0.119                 | 0.073          | 0.079                 | 0.077                 | 5.856         | 5.705                 | 5.529                 |
| Controls             | Yes            | Yes                   | Yes                   | Yes            | Yes                   | Yes                   | Yes           | Yes                   | Yes                   |
| District FE          | Yes            | Yes                   | Yes                   | Yes            | Yes                   | Yes                   | Yes           | Yes                   | Yes                   |
|                      |                |                       |                       |                |                       |                       |               |                       |                       |
|                      |                |                       |                       | (2) Wage income |                      |                       |               |                       |                       |
|                      |                |                       |                       |                |                       |                       |               |                       |                       |
|                      |                |                       |                       | (2) Waged employment |                      |                       |               |                       |                       |
|                      |                |                       |                       |                |                       |                       |               |                       |                       |
|                      |                |                       |                       | (3) Food expenditure |                      |                       |               |                       |                       |
|                      |                |                       |                       |                |                       |                       |               |                       |                       |

Notes: Authors’ elaboration on the FAO dataset. Models in Panel A refer to monthly food expenditure per capita. Models in Panel B refer to the household’s monthly wage income. Controls include the number of male and female adult members, female household head, household head’s age and years of education. Models in Panel C refer to the individual probability of being employed as a waged worker. Controls include gender, age, and years of education. In the regressions with the individual dataset (Panel C) individuals under 14 years of age are excluded from the analysis and errors are clustered at the household level. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.

Moreover, the refugee households present in our sample are in most cases relatively recent arrivals. As Figure 3 shows more than 80 per cent of them arrived within two years prior to the survey.

On this basis, to test the robustness of our results we have carried out the estimates presented above restricting the sample to include only those who did not move in the 2 years or in the 5 years before the survey was carried out. The results for some of the main outcomes are presented in Table 9.14 As it is easy to see, the results are robust to the exclusion from the sample of households who moved after the main inflows. The coefficients are fairly stable and so is their significance.

Another test that can help to add evidence for the market-creation effect is to divide the sample according to the date of establishment of the settlements. The idea is that in both sub-samples hosting-community households can benefit from the presence of the camps, but where refugee presence dates further back in the past we should observe a (larger) positive effect on hosts’ economic outcomes. In Table 10, we show the regression results for food expenditure, wage income and the individual probability to be employed in a salaried job. In the upper panel, we consider only hosting-community households living close to settlements that have been
established in the two years prior to the survey (i.e. after 2016), while in the bottom panel we consider only hosting-community households living close to settlements that have been established before 2016. The effect of proximity to refugees is significantly positive only for the latter group, but the probability to be employed in a waged job seems to be affected also in the short-run, albeit to a lesser extent with respect to the long-run.

7. How close is close?

We have seen that proximity to refugee households exerts a positive effect on the host households’ consumption and economic activity. To assess how far this effect goes, we have plotted the marginal effects for some of the outcome variables discussed above as a function of the distance between host and refugee households. As shown in Figures 4 and 5, the effects on food expenditures tend to disappear once the distance exceeds 6 kilometres and those on wage income if the distance exceeds 4 kilometres. This result confirms the estimates of the related literature and shows that the effects are substantially circumscribed, possibly because of the lack of well-organised market and of high transportation costs.

This finding is consistent also with the results on the probability of running an enterprise. As shown in Figure 6, the positive effect of refugees’ proximity to the hosting community is null after 3 kilometres.

| Panel A: recent settlements | OLS |
|-----------------------------|-----|
| (1) Food expenditure        | (2) Wage income | (3) Waged employment |
| Dist. to refugees (minimum) | 342.9 | -866.1 | -0.00663*** |
| (430.4)                     | (3,907) | (0.00244) | |
| Observations                | 769 | 756 | 2,514 |
| R-squared                   | 0.137 | 0.064 | 0.015 |
| Controls                    | Yes | Yes | Yes |
| Settlement FE               | Yes | Yes | Yes |

| Panel B: old settlements    |
|-----------------------------|
| (1) Food expenditure        | (2) Wage income | (3) Waged employment |
| Dist. to refugees (minimum) | -1,354*** | -6,453*** | -0.0123*** |
| (318.9)                     | (1,902) | (0.00204) | |
| Observations                | 786 | 785 | 3,342 |
| R-squared                   | 0.113 | 0.090 | 0.018 |
| Controls                    | Yes | Yes | Yes |
| Settlement FE               | Yes | Yes | Yes |

Notes: Authors’ elaboration on FAO dataset. Models in Panel A refer to hosting-community households’ living near Settlements established from 2016 onward (i.e. Agjo (DOE 2016), Imvempi (DOE 2017), Omugo (DOE 2017) Lamwo (DOE 2017), Moyo (DOE 2016) and Yumbe (DOE 2016)). Models in Panel B refer to hosting-community households’ living near Settlements established before 2016 (i.e. Ayilo (DOE 2014), Maaji II (DOE 1997), Mungula (DOE 1996), Mungula II (DOE 1996), Rwamwanya (DOE 1964), Kiryandongo (DOE 1990), Kyaka II (DOE 1983), Palabek (DOE 2017), Palorinya (DOE 2016), Bidibidi (DOE 2016)). Models in column (1) refers to per-capita food expenditure in the last month. Model in column (2) refers to household’s income from waged labour and model in column (3) refers to the individual probability to be employed in a salaried job. In the regressions at the household level, controls include the number of male and female adult members, female household head, household head’s age and years of education. In the regression at the individual level, controls are gender, age, and years of education. Individuals under 14 years of age are excluded from the analysis in column (3). In the latter case, errors are clustered at the household level. Robust standard errors in parentheses. *p < 0.10, **p < 0.05, ***p < 0.01.
8. Conclusions

The high number of refugees living in low- and middle-income countries has raised the question of the impact of their presence on the welfare of local communities. As often the refugees are located in deprived and rural areas of the countries, the issue is whether their presence can further harm the living conditions of the hosting communities.
The few non-descriptive studies point to a positive impact of refugees on the economic conditions of local communities, but do not identify the channels through which they are generated. In this paper, we have extended the previous literature by analysing one possible channel linked to the direct interaction between hosts and refugees. Moreover, we extend the evidence relative to Uganda, the country with the highest number of refugees in Africa, to consider the impact of refugees in most of the districts where they are hosted. We have used the distance between host and refugee households as a proxy for the potential economic interaction among them.

Our results indicate that proximity to refugees increases hosts’ consumption, especially of food. This appears to be linked to an increase in wage income as host households’ members are more likely to be employed the closer they are to refugee households. The increase in employment seems to have taken place mainly in the private – both agricultural and non-agricultural – sectors, likely correlated to the creation of small enterprises by the refugees themselves. Indeed, the probability that refugee households run an enterprise is positively correlated with the proximity to the hosting community.

The effects of market creation are, however, very localised. They tend to fade out when the distance between hosts and refugees become larger than about 5 kilometres, confirming that the positive impact of the presence of refugees through direct market creation appears non-negligible but limited to household living close to each other. However, this does not exhaust the possible impacts as there might be other effects of the presence of refugees, positive or negative, that given the nature of the data at our disposal we could not identify.

Notes
1. Adjumani’s settlements, Bidibidi, Imvepi, Kiryandongo, Kyaka II, Kyangwali, Lobule, Nakivale, Oruchinga, Palabek, Parlorinya, Rhino Camp, Rwamanja plus the urban refugees in Kampala.
2. Adjumani, Arua, Isingiro, Kampala, Kamwenge, Kikuube, Kiryandongo, Kyegegwa, Koboko, Lamwo, Madi-Okollo, Obongi and Yumbe.
For recent surveys the reader can refer to Ruiz and Vargas-Silva (2013), Maystadt, Hirvonen, Mabiso, and Vanderhave (2019) and Verme and Schuettler (2021).

The refugee response follows two approaches for land allocation. In one, land for shelter and agriculture is allocated in one single plot. In the other, refugee households are allocated separate plots for shelter and agriculture. Minimum standards require the allocation of at least a 30 m × 30 m agriculture plot with a separate 10 m × 10 m shelter plot. For combined plots, the total area should be at least 50 m × 50 m. However, the actual allocation might differ from these standards depending on the time of arrival and on characteristics of the specific settlement.

Data are available online (https://microdata.fao.org/index.php/catalog/1845; https://microdata.fao.org/index.php/catalog/1844).

In March 2018, 1,378,111 refugees were living in Uganda. 1,048,823 of these in the 14 settlements covered by the household survey (UNHCR, 2021).

The geo-localisation has been reported for 1,572 host households, the sample used in our main specifications.

Results are available upon request.

As the aim is to assess whether hosts’ characteristics to be used as controls in the main analysis are correlated to the distance between host and refugee households, we do not use controls in the estimates except for settlement fixed effects.

Several households did not know the distance to some of the services and their answers are recorded as missing. This explains the varying number of the observations.

For a summary statistics of the same indicators computed on refugee households see Table A3 in Annex A.

The total labour income is the sum of casual and wage income. Results are available upon request.

Sectors are classified according to NACE (rev. 1.1). The public sector encompasses: public administration and defence; compulsory social security; education; health and social work; other community, social and personal services activities; extraterritorial organisations and bodies. The private sector encompasses: mining and quarrying; manufacturing; electricity, gas and water supply; construction; wholesale and retail trade; hotels and restaurants; transport, storage, and communications; financial intermediation; real estate, renting and business activities. Agriculture encompasses: agriculture, hunting, and forestry; fishing.

The results for the other outcomes are available upon request.

To carry out this exercise, we use a discrete measure of the distance which takes values 1 to 10. For example, households living in a radius of 1 kilometre from refugees (or from hosts when looking at the probability of running an enterprise) have a value of 1, while households that lives in a radius from 1 to 2 kilometres has a value of 2, etc. Marginal effects are computed at the mean values of the dependent variable.

Acknowledgements

We would like to thank FAO Uganda, the Uganda Bureau of Statistics (UBOS) and the United Nations Refugee Agency (UNHCR) for their support on data collection. A special thanks to Ugo Leonardi from FAO Somalia for his technical support on the calculation of the distances and on the maps. We thank also Phil Priestly, Ed Taylor, Silvio Daidone and Tiziano Arduini for valuable comments and inputs.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

Data and code used for the analysis are available upon request. Standard disclaimers apply.

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Annex A

Table A1. Summary statistics for hosting-community households (dependent variables)

|                                | Mean   | St. dev. | Min   | Max   |
|--------------------------------|--------|----------|-------|-------|
| Monthly food expenditure per capita – ugx | 18,537 | 16,628   | 0     | 136,400 |
| Monthly non-food expenditure per capita – ugx | 19,760 | 64,426   | 0     | 2,251,204 |
| Monthly own-food consumption per capita – ugx | 30,532 | 35,702   | 0     | 470,578 |
| Monthly income from wage employment – ugx | 45,571 | 138,037  | 0     | 1,450,000 |
| Monthly income from casual employment – ugx | 41,685 | 73,812   | 0     | 700,000 |
| Formal transfers – ugx              | 34,723 | 125,773  | 0     | 1,500,000 |
| Annual value of crop sales – ugx    | 105,338 | 210,601.9 | 0     | 1,835,000 |
| Annual value of livestock products sales – ugx | 8,217 | 77,854.3 | 0     | 1,500,000 |
| Running enterprise (last month)     | 0.40   | 0.49     | 0     | 1    |
| Observations                       | 1,632  |          |       |       |

Notes: Authors’ elaboration on FAO dataset. Summary statistics are computed for hosting-community households. In the main analysis, only households with available data on the distance are included. Furthermore, 1st and 99th percentiles of each variable’s distribution are dropped in the regression estimations.

Table A2. Summary statistics from employment (individual data)

|                                | Mean   | St. Dev. | Min  | Max  |
|--------------------------------|--------|----------|------|------|
| Employment in casual labour    | .2862  | .452     | 0    | 1    |
| Employment in wage labour      | .06009 | .238     | 0    | 1    |
| Employment in the public sector| .029   | .167     | 0    | 1    |
| Employment in the private sector| .016  | .124     | 0    | 1    |
| Employment in the agricultural sector | .014 | .116    | 0    | 1    |
| Observations                   | 6,058  |          |      |      |

Notes: Authors’ elaboration on the FAO dataset. Summary statistics are computed for individuals belonging to hosting-community households only. For the same summary statistics computed for individuals belonging to refugee households, please see Table C2 in Annex C.

Table A3. Summary statistics for refugee households

|                                | Mean   | St. deviation | Min   | Max   |
|--------------------------------|--------|--------------|-------|-------|
| Monthly food expenditure per capita – ugx | 9,792.00 | 17,594.52   | 0    | 304,400 |
| Monthly non-food expenditure per capita – ugx | 11,158.96 | 24,424.44   | 0    | 819,550 |
| Monthly own-food consumption per capita – ugx | 10,950.25 | 26,501.64   | 0    | 466,666 |
| Monthly moneraty income from labour waged and casual – ugx | 31,874.05 | 72,551.21   | 0    | 760,000 |
| Monthly monetary wage from salarie job – ugx | 15,474.13 | 67,912.11   | 0    | 1,000,000 |
| Monthly monetary wage from casual job – ugx | 17,173.05 | 36,440.85   | 0    | 310,000 |
| Formal transfers – ugx           | 74,596.1 | 93,244.97   | 0    | 900,000 |
| Annual value of crop sales – ugx | 28,646.59 | 81,454.3    | 0    | 750,000 |
| Annual value of liveproduct sales – ugx | 1,229.94 | 27,671.33   | 0    | 1,150,000 |
| Running enterprise (last month)  | 0.22   | 0.41        | 0    | 1    |
| Observations                    | 2,107  |             |      |      |

Notes: Authors’ elaboration on FAO dataset. Summary statistics computed for refugee households.
### Table B1. First-stage estimation of wage income regression

| Dependent variable                                      | Host HHs’ minimum distance to refugees |
|---------------------------------------------------------|----------------------------------------|
| Dist. to settlement (min)                               | 0.08***                                |
|                                                         | (10.57)                                |
| Number of male adults (15+)                             | 0.02                                   |
|                                                         | (0.62)                                 |
| Number of female adults (15+)                           | −0.01                                  |
|                                                         | (−0.44)                                |
| Female headed household                                 | 0.00                                   |
|                                                         | (0.04)                                 |
| Age of the head of the household                        | 0.00                                   |
|                                                         | (0.46)                                 |
| Adults’ average years of education                      | −0.02                                  |
|                                                         | (−1.55)                                |
| Adjumani                                                | 0.22                                   |
|                                                         | (1.37)                                 |
| Arua                                                    | −1.02***                               |
|                                                         | (−8.08)                                |
| Kiryandongo                                             | −1.71***                               |
|                                                         | (−14.68)                               |
| Lamwo                                                   | −1.10***                               |
|                                                         | (−8.09)                                |
| Moyo                                                    | −1.12***                               |
|                                                         | (−8.51)                                |
| Yumbe                                                   | −2.18***                               |
|                                                         | (−11.10)                               |
| Kamwenge                                                | 2.17***                                |
|                                                         | (8.59)                                 |
| Constant                                                | 1.76***                                |
|                                                         | (9.13)                                 |
| Observations                                            | 1,541                                  |
Annex C

Table C1. Distance between refugee and host households, in kilometres

| Distance to hosts (km)       | Mean   | St. deviation | Min   | Max   |
|-----------------------------|--------|---------------|-------|-------|
| Minimum                     | 1.65   | 1.30          | 0     | 7.99  |
| Mean                        | 10.30  | 4.83          | 2.87  | 22.70 |
| Median                      | 10.33  | 5.12          | 1.52  | 24.84 |
| Distance to settlement (km) | Minimum| 8.91          | 8.01  | 0.08  | 38.06 |
| Mean                        | 12.01  | 7.55          | 0.12  | 38.06 |
| Median                      | 12.20  | 7.79          | 0.12  | 38.06 |
| Observations                | 2,018  |               |       |       |

Notes: Authors’ elaboration on FAO dataset. Summary statistics computed for refugee households. The distances to the settlement are computed with respect to administrative centre.

Table C2. Summary statistics for employment (individual data)

| Employment                       | Mean   | St. deviation | Min | Max |
|----------------------------------|--------|---------------|-----|-----|
| Employed in public sector        | 0.01   | 0.09          | 0   | 1   |
| Employed in private sector       | 0.00   | 0.06          | 0   | 1   |
| Employed in agricultural sector  | 0.00   | 0.07          | 0   | 1   |
| Observations                     | 13,816 |               |     |     |

Notes: Authors’ elaboration on the FAO dataset. Summary statistics are computed for individuals belonging to refugee households.