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How to Cope with a Refugee Shock?

Evidence from Uganda

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Abstract

Sub-Saharan Africa hosts a large proportion of the world's refugees, raising concerns about the consequences of hosting refugees. This paper focuses on Uganda, which is the largest refugee hosting country in Africa and is praised for its progressive refugee policy. The paper analyzes the effects of hosting refugees, relying on longitudinal data and an instrumental variable approach. The results indicate that Ugandan households benefit from living close to the refugee settlements. In contrast with the existing literature, the analysis finds that those initially involved in subsistence agriculture benefit the most. The effect seems to be driven by the few households able to move from subsistence agriculture to commercial farming and to some extent, to wage employment.

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How to Cope with a Refugee Shock? Evidence from Uganda

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1. Introduction

Approximately 85 percent of the global refugees are hosted in developing countries (UNHCR, 2020). Sub-Saharan Africa (SSA) hosts about one-third of them (Ruiz & Vargas-Silva, 2017). UNHCR (2019) asserts that the number of refugees in the region increased threefold between 2010 and 2019. This rise has been mainly attributed to persistent conflicts in the region (Verwimp & Maystadt, 2015; Kasozi, 2017 & Ivanova et al., 2018). Protracted conflict has also led to long refugee stays; an average of 9-21 years according to Hunter (2009). Hosting refugees could have far-reaching consequences in areas already struggling to ameliorate their own economic situation (Maystadt et al., 2019).

There has been a booming literature assessing the consequences of hosting refugees (Meyer et al., 2011; Ruiz & Vargas-Silva, 2017; Maystadt et al. 2019). Although the literature highlights that refugees can have a positive effect on economic development but with likely distributional consequences, the evidence from individual studies is mixed (Ruiz and Vargas-Silva 2017; Maystadt et al. 2019; Verme and Schuettler 2021). In their review, Verme and Schuettler (2021) argue that the direction of impact depends on which economic dimension is studied. For instance, they find that beneficial impacts are less likely if the outcome of interest is host employment or wages. By contrast, it is more likely if the outcome of interest is well-being measured in terms of income, consumption or wealth (Verme & Schuettler, 2021). Furthermore, they stress that few studies have employed panel data to study the impact of hosting refugees on the host communities.

Based on panel data collected between 2009 and 2012, we assess the impact of hosting refugees in Uganda on material welfare, measured by the consumption per adult equivalent. Our main outcome variable differs from studies such as Alix-Garcia and Saah (2009), Alix-Garcia et al. (2012), and Loschmann et al. (2019), which focus on market prices, host employment and household assets. Alix-Garcia et al. (2018) is one exception since they use cross-sectional data on consumption to validate their results based on night light indexes. Other studies on SSA using longitudinal data on consumption include Maystadt and Verwimp (2014), Ruiz and Vargas-Silva (2017), and Maystadt and Duranton (2018) on the Kagera region of Tanzania; and Alloush et al. (2017) on the Congolese refugees in Rwanda. However, all these studies investigate the economic impacts of refugees living in camp settings.

Uganda is an interesting case study. According to the unique Ugandan refugee policy, refugees are not settled in camps but rather live in settlements. According to Betts et al. (2017), Betts et

al. (2019), Kreibaum (2016) and UNDP (2017), refugees enjoy a certain freedom of movement, the right to work and are encouraged to engage in agriculture towards attaining self-reliance by availing them with plots of agricultural land and seeds for planting. The World Bank Group (2016) further contends that this progressive refugee policy also supports local integration of refugees. Verme and Schuettler (2021) argue that restrictions on right to work and movement for refugees can significantly determine the direction of impacts on the host communities.

To the best of our knowledge, Kreibaum (2016) and d'Errico et al. (2021) are the closest studies. Kreibaum (2016) examines the effect of refugee presence on household welfare in terms of consumption in Uganda. The author uses three repeated cross-sections of the UNHS[1] data and employs a difference-in-difference strategy to determine the effect of refugee presence, in particular in districts hosting Congolese refugees. d'Errico et al. (2021) find that the proximity to refugees, considered as a measure of inter-group interactions, increases the welfare of the hosting population. Our paper complements these studies in several ways. First, we exploit nationally representative surveys, while d'Errico et al. (2021) focus on a few settlements and cross-sectional data collected by FAO in their surroundings. Second, we use panel data and can therefore exploit within district and household variations to better deal with unobserved heterogeneity. The longitudinal nature of our data also allows us to adopt a more dynamic perspective by investigating possible coping strategies at the household level.

Our study utilizes the LSMS-ISA data spanning 3 waves from 2009 to 2012, to quantify the effect of the refugee presence on households' welfare. We consider refugees from various source countries and residing close to local communities (clusters in LSMS). We construct a refugee index which weights the number of refugees in the closest refugee settlements by the inversed distance from those settlements to the clusters. In order to limit endogeneity concerns, we instrument this variable of interest with a shift-share instrumental variable which is based on the distance of the refugee settlements to the closest border crossing points for each source country.

Our findings with regards to household consumption are similar to those found in Kenya (Alix-Garcia et al., 2018), Rwanda (Alloush et al., 2017), and Tanzania (Maystadt & Verwimp, 2014). Our results indicate that rural households, living close to the refugee settlements benefit from the presence of refugees. Similarly, Alix-Garcia and Saah (2009) find that rural

[1] Uganda National Household Survey carried out in the three waves of 2002–03, 2005–06 and 2009–10.

households closer to refugee camps experience a positive wealth effect which could be resulting from production and supply of non-aid food products in response to the upward demand and price shifts. We also investigate the heterogeneity of the average impact, its distributional consequences and further discuss coping strategies in the labor and commodity markets. Education level of the household head does not seem to explain the effects of the refugee presence. However, we find that households who are able to change their main source of income to commercial farming benefit more from the refugee influx. This is in line with Whitaker (2002) who argues that it is the relatively wealthier farmers, thus not reliant on subsistence farming, who take advantage of the price dynamics in addition to availability of cheap labor. We also find that the type of crop produced matters in this context. Despite the differences in research designs, it is also interesting to observe that d'Errico et al. (2021) report a similar shift in economic activity. They find a significant reduction in the value of crop sales and an increase in wage income for host-households living closer to the refugee households. d'Errico et al. (2021) points to a shift towards wage employment as an important adaptation mechanism. Similarly, we unearth changes in households' main source of income as a potential coping strategy. However, though we find that households who change to wage employment seemingly benefit, potentially bigger welfare returns are observed for households who move to commercial farming.

The paper is organized as follows: The next section summarizes the background of the study. Section 3 describes the data used in this study and presents the descriptive statistics. Section 4 covers the empirical strategy employed. Section 5 discusses the main results of the study and the assumptions underlying the identification strategy used. Section 6 presents insights into the potential coping strategies on the labor and commodity markets. The final section concludes with a summary of the findings and possible recommendations for policy and future research.

2. Background

Uganda first hosted Polish refugees fleeing violence in Europe in 1942 (Watera et al., 2017). Though these were later resettled in Britain, Australia and Canada (Watera et al., 2017), the country has continued to host refugees from its neighbors including South Sudan, Somalia, Burundi, Rwanda and the Democratic Republic of Congo (World Bank Group, 2016). The country has received an average of approximately 161,000 refugees annually since its independence in 1962 (World Bank Group, 2016) and a monthly average of 17,000 refugees

between October 2018 and February 2019 (World Bank, 2019). Uganda now hosts about 1.4 million refugees, from 17 different countries (UNHCR, 2020). In this study, the refugee data set captures a cumulative total of 3,391,194 refugees in the years 2000 to 2016. Arguably, Uganda currently hosts the most refugees in Sub-Saharan Africa and is the third largest refugee hosting nation globally after Turkey and Pakistan (REACH Initiative, 2018; WHO, 2018; World Bank, 2019; UNHCR, 2020). The highest cumulative total number of refugees received in Uganda between the years 2000 and 2016 are from Sudan, South Sudan and the Democratic Republic of Congo (DRC) which represent about 78% of the cumulative total number of refugees received in the country (Figure 1).[2]

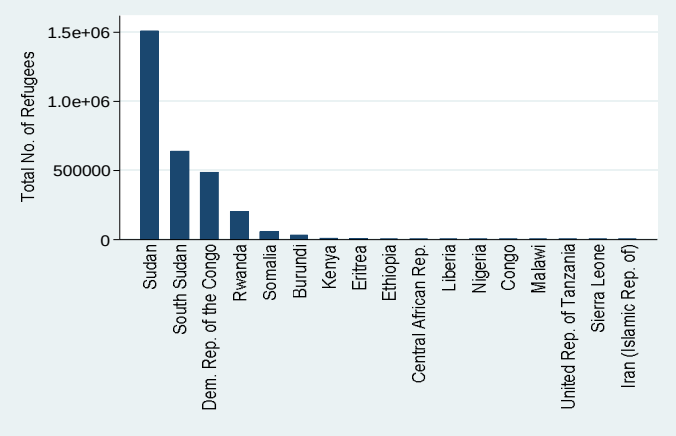


Figure 1: Total number of refugees by country of origin
(*Source: Authors' illustration using study dataset*)

Refugees in Uganda are mostly settled in the western flank of the country (Figure 2). Of the 127 districts of Uganda, the refugees are found in Adjumani, Arua, Koboko, Moyo and Yumbe in the West Nile region; Lamwo/Kitgum in the Northern region; Kiryandongo, Hoima, Kyegegwa, Kamwenge and Isingiro in the (South) Western region and; Kampala district in the central region of the country (World Bank, 2019). Therefore, from 2000 to 2016, the refugees have been distributed over 14 districts with Adjumani district hosting the highest number of refugees, about 28% of the cumulative total of the refugees. Arua, Kampala and Isingiro districts follow with about 13% each of the cumulative total number of refugees in Uganda between 2000 and 2016. Kisoro district has hosted the lowest number of refugees with less than 1% of the cumulative total of refugees in Uganda over that period (Figure 3).[3]

[2] The absolute figures are in Appendix 1, Table A1.

[3] The percentages are in Appendix 1, Table A2 and the averages are in Appendix 1, Table A3. Figure 4 also shows that the distribution of the female and male refugees is quite balanced across the districts with some

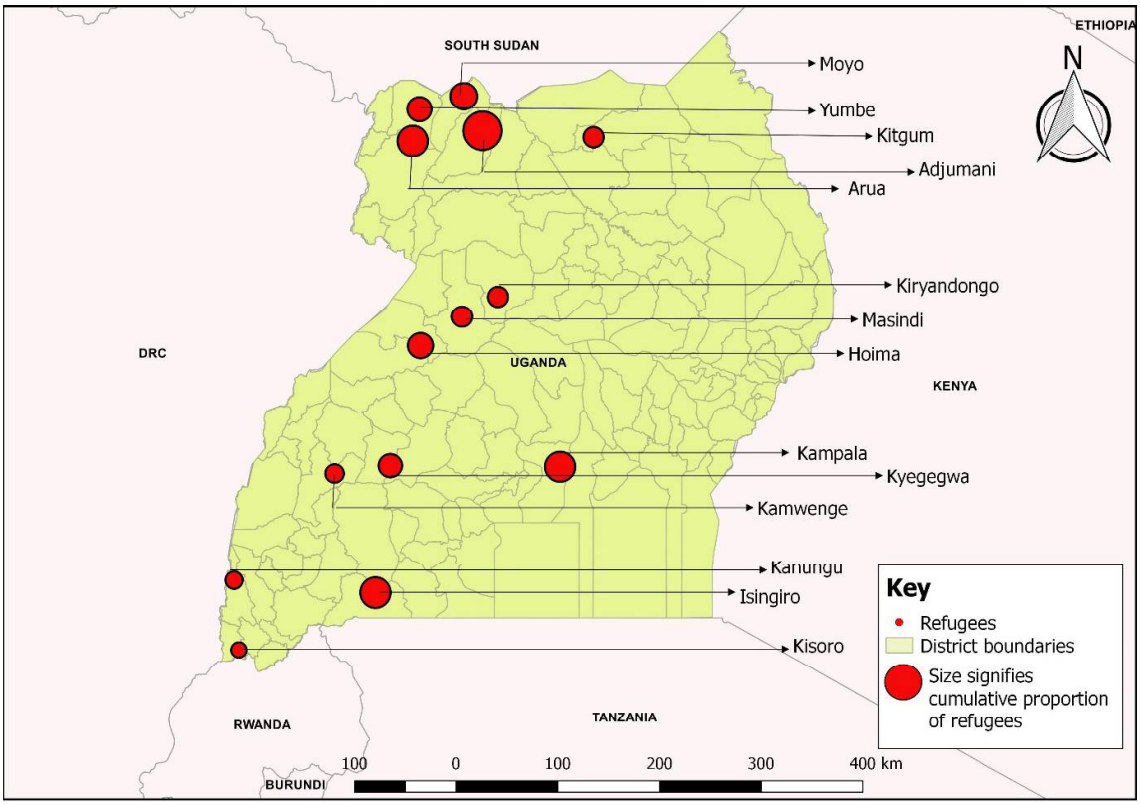


Figure 2: Map of Uganda showing the spatial distribution of refugees in the period from 2000 to 2016 (*Source: Authors' illustration*)

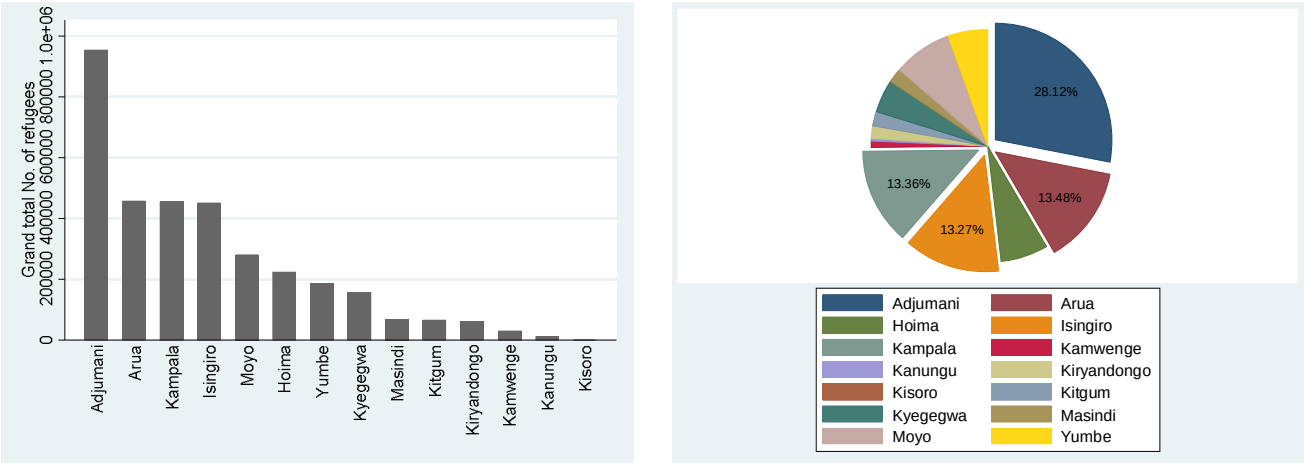


Figure 3: Aggregate distribution of refugees in Uganda (*Source: Authors' illustration using study dataset*)

having slightly more female refugees (Adjumani, Kanungu, Kiryandongo, Kisoro, Kitgum, Kyegegwa, Masindi, Moyo and Yumbe) and others having slightly more male refugees (Arua, Hoima, Isingiro, and Kamwenge). The absolute figures are in Appendix 1, Table A2 and the annual totals represented in Figure A1.

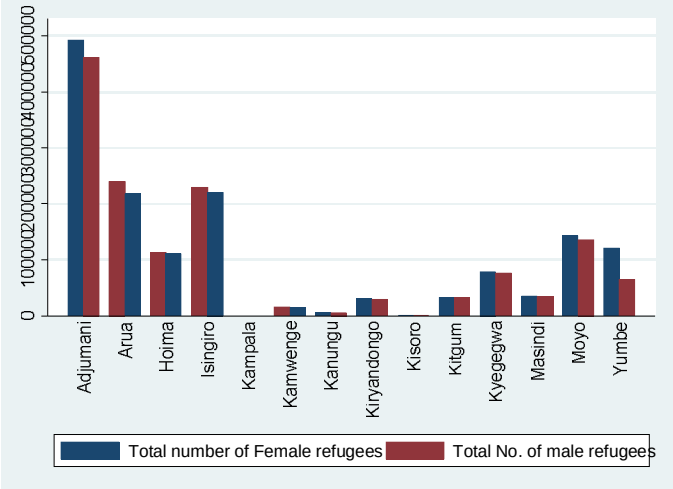


Figure 4: Aggregate distribution of refugees (disaggregated by sex) in Uganda
(Source: Authors' illustration using study dataset)

Uganda's refugee management approach, backed by its Refugees Act of 2006 and Refugees Regulations of 2010, is among the most progressive refugee approaches in the world (World Bank, 2019). Enshrined in the country's refugee regulatory framework are important principles and freedoms which are protective of the refugees hosted within the country. Firstly, refugees are not settled in camps but mostly live in refugee settlements (Kreibaum, 2016; UNDP, 2017). Refugee settlements, according to Jacobsen (2001), are expanses of land segregated purposely to host refugees for protracted periods of time. In contrast with camps therefore, refugee settlements are usually characterized by relatively more permanent housing structures, they are planned for population growth and land for farming is provided to support refugees in attaining self-sufficiency, among other differences (Jacobsen, 2001). Refugees in Uganda also have the freedom of movement and association, a right to find or establish jobs/employment, a right to access social services including education and health, and a right to own property and access land, among others (Betts et al., 2017; Betts et al., 2019; World Bank, 2019). As recommended by the 1999 refugees Self-Reliance Strategy (SRS), refugees are supposed to be given seeds and land to encourage farming, among other things (Betts et al., 2017; Betts et al., 2019). The refugees SRS was formalized through the Office of the Prime Minister (OPM) and in collaboration with UNHCR (WHO, 2018; Betts et al., 2019). The aim of the refugees SRS was obviously to promote the self-reliance of the refugees. According to UNHCR (2005), "Self-reliance is the social and economic ability of an individual, a household or a community to meet essential needs (including protection, food, water, shelter, personal safety, health and education) in a sustainable manner and with dignity" (p.1). Therefore, the vision with this SRS was the progressive reduction in the need for humanitarian aid for refugee assistance in Uganda

(World Bank, 2019). Moreover, the Development Assistance for Refugee-Hosting Areas (DAR) program and the Refugee Act, which followed after, are premised upon the refugees SRS (Kreibaum, 2016).

Uganda's approach has also embodied the support to refugee-hosting communities. This approach is guided by the Comprehensive Refugee Response Framework (CRRF) which was launched in March 2017 (UNHCR, 2019) and the Global Compact on Refugees (GCR) born in 2018. The CRRF is annexed within the United Nations' 2016 New York Declaration for refugees and migrants (Hansen, 2018). According to Thomas (2017), the CRRF advocates for a creative approach to encourage refugee self-reliance while supporting the hosting communities. Thus as the self-reliance of the refugees is being promoted, the resilience and service delivery of host communities is strengthened and a peaceable co-existence of refugees and hosts is encouraged (World Bank, 2019). Moreover, the previous Settlement Transformative Agenda (STA) and the linked Refugee and Host Population Empowerment (ReHoPE) strategic framework emphasized resilience and self-reliance for both refugees and hosting communities (Mathys, 2016; Betts et al., 2019). By progressively improving social service delivery capacity and fostering sustainable livelihoods leading to socio-economic growth in refugee-hosting districts, ReHoPE serves to integrate humanitarian and development systems to ensure effective support to refugee-hosting districts in Uganda (Mathys, 2016).

The drive to establish the CRRF was further demonstrated by the development of a guide for the CRRF implementation, resulting in experiences which consequently produced the Global Compact on Refugees (GCR) that highlights tangible targets and approaches in refugee management. The GCR which was affirmed by the UN General Assembly in December 2018 was then incorporated in Uganda's National Plan of Action, a living guide which is periodically updated and maps out the direction for the GCR and the CRRF in Uganda. Uganda's refugee policy environment therefore supports local integration for refugees (World Bank Group, 2016). It is a refugee management model allowing for integrated service provision and encouraging free social and economic interactions between refugees and hosts (Kreibaum 2016; Betts et al., 2019).

3. Data

We use refugee data provided by UNHCR at the settlement level and a nationally representative household level data set derived from the LSMS-ISA. These data sets are combined at the Enumeration Area (EA) level (Figure 5). Settlement-level information is linked to the EA level household information by year.

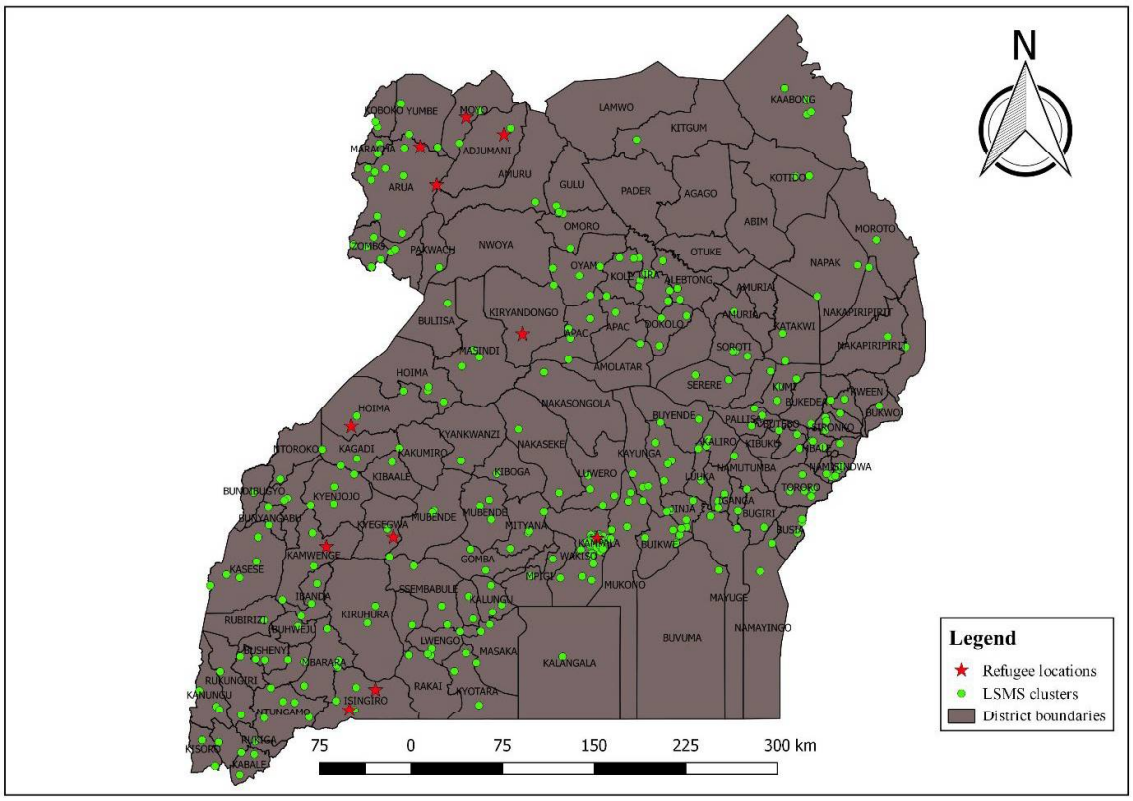


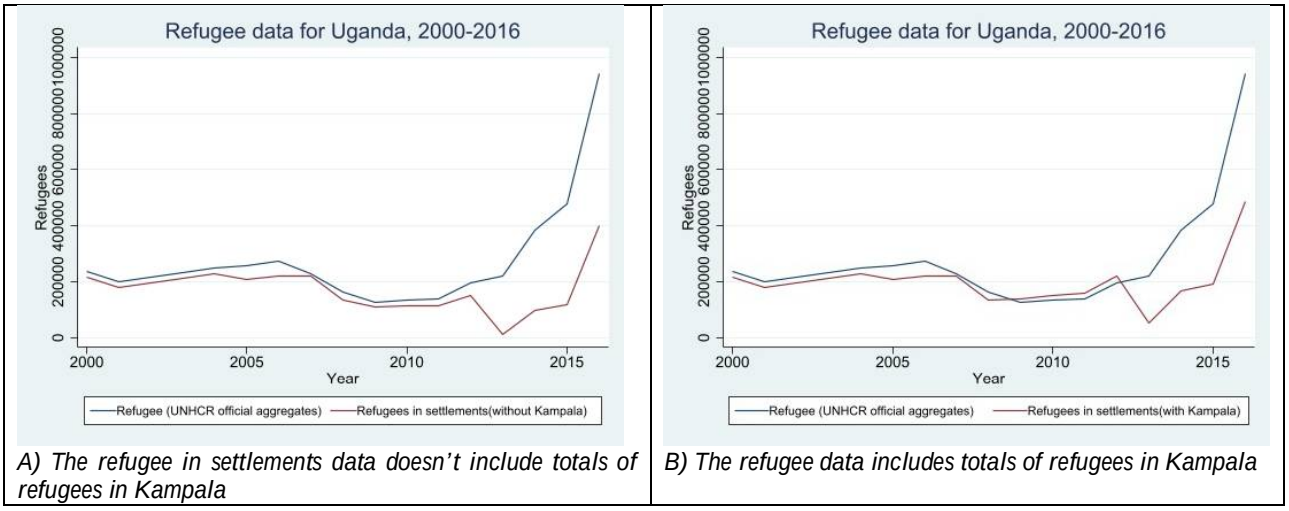
Figure 5: Map showing the LSMS clusters and refugee settlements/locations as captured in the balanced panel (2009-2012) (Source: Authors' illustration)

3.1. Refugees Data

We use geo-referenced data on the number of refugees received per year from 2000 to 2016 in settlements within a total of 14 districts in Uganda. Figure 6 illustrates the difference between our disaggregated data covering refugees in settlements and the national statistics on the total number of refugees in Uganda reported annually by UNHCR.

The co-evolution of the lines reflects the high quality of our data. However, Figure 6 shows that there is still a gap between the refugee numbers reported from the settlements and the annual aggregate of refugees received and registered by UNHCR. This could be because of the timing of the reporting. UNHCR aggregates capture all refugees received within the country in a particular year. By contrast, the settlement-level data, which could be reported at the end of

the year, is not capturing refugees who have left the settlements and self-settled within the towns in the hosting districts. Nevertheless, this gap is smaller within the time period observed in our outcomes data than in subsequent years. We observe a widening gap after 2012 (Figure 6; panel A). Such a gap may be explained by the increasing number of dispersed refugees (not captured in our disaggregated data) after 2012. Our disaggregated data capture refugees in settlements and do not include self-settled refugees. Attempting to close this gap, we include within our refugee data set the total number of refugees reported to have settled in Kampala every year.[4] Because of the promotion of the self-reliance strategy, many of the refugees move out of the settlements and self-settle in major cities including Kampala. Moreover, according to Omata and Kaplan (2013), there was an unprecedented increase in the number of refugees residing in Kampala in 2012, causing the capital to be the second largest refugee-hosting site at the time. This could explain the gap in the period 2012-2013.



A) The refugee in settlements data doesn't include totals of refugees in Kampala

B) The refugee data includes totals of refugees in Kampala

Figure 6: Graphs showing the trends of refugee numbers in settlements (study dataset) and total number of refugees received in Uganda (UNHCR)

Figure 6 (panel B) shows that adding the Kampala aggregates from 2009 to 2016 to our original refugee data slightly narrows the gap from 2012 to 2016. However, we also notice that from 2009 to 2011, the settlement level reported data supersedes the UNHCR annual aggregates. This reveals a likelihood that the Kampala aggregates could be overlapping with some annual data reported from the settlement. That is, the same refugees who were captured at the settlements could have migrated to Kampala and been included in the count there as well. This could lead to errors in the data. But updated UNHCR annual aggregates (Figure A2; Appendix)

[4] The data we obtained only contains totals in Kampala from 2009 to 2016 and not for previous years.

eliminate this risk. We will nonetheless discuss the robustness of our results to the addition of Kampala.[5]

3.2. LSMS-ISA household data

We use the Living-Standards Measurement Study - Integrated Studies on Agriculture (LSMS-ISA) data set for Uganda provided by the World Bank. These LSMS-ISA data sets are derived from the Uganda National Panel Survey (UNPS) which comprise 5 waves of interviews (2009-2010, 2010-2011, 2011-2012, 2013-2014 and 2015-2016). The UNPS collects information for a sample of households which is representative at the national, urban/rural and main regional levels (North, East, West and Central regions). The LSMS-ISA data set provides household and individual level information including household welfare measured by consumption aggregate per adult equivalent, indicators of participation and performance in the workforce within the agricultural and non-agricultural sectors.

We retain only the first 3 waves as they minimize attrition and have a similar structure. In the consecutive waves, parts of the sample were replaced by new households obtained from an updated sampling frame developed from the 2012 Uganda Population and Housing Census by Uganda Bureau of Statistics (UBOS). Additionally, a new household identification system was implemented after the third wave, making it difficult to construct a balanced panel data set across all 5 waves.[6] Our household data is therefore a strongly balanced panel data set comprising 2,458 households distributed across 320 enumeration areas (EA) and surveyed in the first 3 rounds of the UNPS. The data cover 106 districts out of the 111 listed in 2010 (127 districts in 2017).

3.3. Descriptive statistics by district

We first compare households and individual characteristics between refugees-hosting and non-hosting districts between the first wave (2009/2010) and the last wave (2011/2012) of UNPS data collection. We do so using our main variables of interest (household welfare measured by consumption per adult equivalent, individual labor market outcomes, household non-agricultural income and output) and some control variables (socio-demographic characteristics). Tables 1 presents the comparison over socio-demographic characteristics at

[5] The updated UNHCR annual aggregates (Figure A2; Appendix) only include Kampala totals from 2009 to 2016.
[6] Indeed, the household ID format has been modified for the last 2 waves, a change that complicates the matching across waves. Balancing the panel across all five waves of the longitudinal survey results in a significant drop in the number of enumeration areas/clusters from 320 to 211. The number of households also drops from 2,462 interviewed across the first 3 waves to 1,431 households interviewed across the 5 waves. Attrition is too much of a concern for robust inference.

the household level.[7] Table 2 presents the comparison over the labor market outcomes at the individual level, considering only the household members who are part of the working-age population (aged between 15 and 64 years old). These descriptive statistics are presented without Kampala, since the capital city may have specific characteristics and will be excluded from our main analysis.[8]

According to Table 1, in the base wave, the average difference between the refugee-hosting and non-hosting districts is not statistically significant from zero for several household characteristics. For instance, we do not observe significant differences in the educational composition of the household heads between refugee-hosting and other districts. Household heads' age and gender characteristics are also fairly similar. However, we observe that the non-hosting districts have statistically larger households, with more households having household heads who are separated (divorced/widowed) and never married.[9] Refugee-hosting districts have more households with household heads who are polygamously married, and these areas rely more on subsistence and less on commercial farming than the non-hosting districts. Several of these statistically significant differences persist in the last wave.

Of particular interest, we find that household welfare in the non-hosting districts is greater than household welfare in the refugee-hosting ones in the base wave, while the difference ceases to be statistically significant in the last wave. This is suggestive of a relative improvement in household welfare for the refugee-hosting areas over the 3 years between the base wave and the last wave. Notably, the differences between the two areas across some variables, for instance the proportion of male headed and female headed households, become statistically different from zero in the last wave. We control for these covariates in the regression analysis.

Table 2 presents descriptive statistics at the individual level. The refugee-hosting and non-hosting districts seem to follow different trends regarding labor force participation and the distribution of occupations within the respective workforce. Labor force participation is higher in refugee-hosting districts but the gap narrows over time. Meanwhile, the proportion of unpaid workers and apprentices is higher in non-hosting districts in the base wave but this difference

[7]This comparison at the individual level is presented in the appendix (Appendix 2; Tables A4 & A5).

[8]Being the capital and hosting a considerable but not comprehensive number of self-settled refugees, Kampala district potentially confounds the study results in numerous ways. The descriptive statistics including Kampala are presented in the Appendix (see Appendix 2; Table A6). Our empirical analysis is therefore performed without the district of Kampala. The results including Kampala will be presented in the robustness section.

[9] Household size is constructed based on the household roster.

is not statistically different from zero in the last wave. Regarding the main source of income, differences only appear in the last wave between the refugee-hosting and non-hosting districts. On average more individuals from refugee-hosting areas are involved in household enterprises. Individuals from non-refugee hosting districts rely more on property and investment and transfers and other benefits than those in refugee-hosting districts. Also, individuals in refugee-hosting districts have received more income in kind while those in non-refugee hosting districts have received more income in cash. Additionally, individuals in non-refugee hosting districts have on average received a higher proportion of their monthly revenue from non-agricultural activities than individuals in refugee-hosting districts. These differences persist to the last wave (Table 2).

Overall, descriptive statistics brush a two-sided picture. On the one hand, if we were to compare households or individuals in refugee-hosting districts versus others, we run the risk of capturing the lower standards of living as reflected by lower consumption per adult equivalence at baseline or the strong reliance on subsistence agriculture in refugee-hosting districts. In identification terms, we may fear the risk of a downward bias from a *naïve* comparison. On the other hand, the descriptive statistics argue against a too static view on the refugee economies. While the gap in terms of welfare seems to have narrowed, the sources of income have changed quite a lot, with a stronger reliance on wage employment and subsistence farming, and somewhat surprisingly, the opposite for non-agricultural self-employment. These changes are sufficiently puzzling to investigate further distributional effects and possible coping strategies in Section 6.

Table 1: Comparing household and HH head indicators between non-refugee hosting and refugee hosting districts (excluding Kampala)

	In the base wave=2009/10						*In the last wave=2012*					
	Mean (Non-hosting)	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**
HH welfare(consumption aggregate per adult equivalent)	56666.446	1835	50487.684	257	6178.762*	3471.519	60848.386	2008	53033.680	271	7814.706	7793.058
Rural locations	0.823	2026	0.890	273	-0.067***	0.024	0.835	2026	0.890	273	-0.055**	0.024
HH size	6.239	2026	5.883	273	0.357*	0.201	-	-	-	-	-	-
Age of HH head	46.089	2023	46.179	273	-0.090	0.980	47.518	2025	47.744	273	-0.226	0.964
HH head male	0.720	2026	0.758	273	-0.038	0.029	0.687	2026	0.736	273	-0.050*	0.030
HH head female	0.280	2026	0.242	273	0.038	0.029	0.313	2026	0.264	273	0.050*	0.030
HH head education level												
No formal education	0.198	1908	0.198	263	0.000	0.026	0.194	1979	0.209	268	-0.015	0.026
Didn't complete primary	0.429	1908	0.426	263	0.003	0.033	0.411	1979	0.403	268	0.008	0.032
Completed primary	0.266	1908	0.262	263	0.004	0.029	0.280	1979	0.272	268	0.008	0.029
Secondary and above	0.106	1908	0.114	263	-0.008	0.020	0.114	1979	0.116	268	-0.001	0.021
HH head marital status												
Married monogamously	0.559	2021	0.571	273	-0.012	0.032	0.537	2025	0.546	273	-0.009	0.032
Married polygamously	0.185	2021	0.260	273	-0.076***	0.025	0.195	2025	0.271	273	-0.076***	0.026
Separated(divorced/widowed)	0.237	2021	0.165	273	0.072***	0.027	0.248	2025	0.176	273	0.073***	0.027
Never married	0.019	2021	0.004	273	0.016*	0.008	0.020	2025	0.007	273	0.013	0.009
HH main source of income												
Subsistence farming	0.535	1946	0.618	262	-0.083**	0.033	0.566	1856	0.630	262	-0.064**	0.033
Commercial farming	0.028	1946	0.000	262	0.028***	0.010	0.012	1856	0.008	262	0.004	0.007
Wage employment	0.160	1946	0.149	262	0.011	0.024	0.129	1856	0.160	262	-0.031	0.022
Non-agric. self-employment	0.205	1946	0.179	262	0.025	0.026	0.213	1856	0.168	262	0.045*	0.027
Remittances & Others	0.072	1946	0.053	262	0.019	0.017	0.080	1856	0.034	262	0.046***	0.017

*Two sample t-test with unequal variances between refugee hosting and non-hosting districts. Significance level: *** p<0.01, ** p<0.05, * p<0.1*

Table 2: Comparing labor market outcomes at the individual's level for refugee's hosting and non-hosting districts (excluding Kampala)

		In the base wave=2009/10						*In the last wave=2012*					
Variables	**Levels**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**
Labor force participation (12 months)		0.525	13160	0.569	1864	-0.044***	0.012	0.441	15889	0.477	2193	-0.036***	0.011
	Wage workers	0.157	9780	0.174	1421	-0.017	0.011	0.126	9939	0.142	1440	-0.016	0.010
	Self-employed	0.121	9778	0.130	1421	-0.010	0.010	0.098	9939	0.101	1440	-0.003	0.008
	Unpaid workers	0.046	9780	0.037	1420	0.009*	0.005	0.049	9938	0.049	1439	-0.000	0.006
	Apprenticeship	0.010	9782	0.001	1421	0.009***	0.001	0.007	9938	0.005	1440	0.002	0.002
	Family workers	0.632	9782	0.678	1421	-0.046***	0.013	0.619	9936	0.672	1440	-0.054***	0.013
Worked months (12 months)		8.669	721	8.591	93	0.077	0.431	9.654	5496	9.797	807	-0.142	0.117
Main source of income													
	Subsistence farming	0.560	12708	0.563	1805	-0.004	0.012	0.575	14760	0.616	2118	-0.041***	0.011
	Commercial farming	0.032	12708	0.029	1805	0.003	0.004	0.016	14760	0.017	2118	-0.001	0.003
	Wage employment	0.148	12708	0.143	1805	0.005	0.009	0.121	14760	0.148	2118	-0.027***	0.008
	Non-ag. Self-employment	0.198	12708	0.202	1805	-0.003	0.010	0.210	14760	0.180	2118	0.030***	0.009
	Remittances & others	0.062	12708	0.063	1805	-0.001	0.006	0.079	14760	0.040	2118	0.039***	0.005
Other sources of income													
	HH enterprises	0.764	12738	0.817	1805	-0.052***	0.010	0.742	14779	0.813	2118	-0.071***	0.009
	Property & investments	0.049	12738	0.033	1805	0.016***	0.005	0.045	14779	0.016	2118	0.029***	0.003
	Transfers & other benefits	0.187	12738	0.151	1805	0.036***	0.009	0.213	14779	0.171	2118	0.042***	0.009
Income received in cash		1001406.66	12738	755617.68	1805	245788.98***	55264.39	1462539.37	14716	827723.97	2094	634815.40***	58819.71
Income received in kind		117858.05	12738	139507.10	1805	-21649.05**	10815.08	198902.89	14640	259817.51	2085	-60914.61***	11997.49
Av. monthly revenue from non-ag. activities		532430.61	6859	276228.80	1014	256201.81***	61756.55	914609.66	6080	541996.37	909	372613.29***	62027.61

*Two sample t-test with unequal variances between refugee hosting and non-hosting districts. Significance level: *** p<0.01, ** p<0.05, * p<0.1*

The different sources of income (main and other) are measured at the household level and then attributed to all household members who are part of the active population (age between 15 and 64 years)

4. Empirical strategy

Our aim is to causally quantify the effect of refugee presence on host communities and then discuss the potential coping strategies employed by refugee-hosting households. Specifically, we investigate; whether refugees' influx impacts households' welfare; the distributional effects induced by the presence of refugees; and the potential channels through which refugees affect the welfare of households. The household welfare is proxied by the consumption aggregate which is adjusted for household demographic composition in terms of sex and age.[10] Hence, we use the consumption aggregate per adult equivalent scales for Ugandan households as our proxy for household welfare. Then we weave out the coping strategies implemented by households in reaction to experienced refugee shocks.

We assess the impact of the presence of refugees at the year of interview between 2009 and 2012. To that purpose, we construct a refugee index which weights the number of refugees in the closest refugee settlements by the inversed distance from those settlements to the clusters.[11] We only consider refugee settlements within a certain distance (buffer). Given that the distribution of households as a function of distance to the closest refugee settlement (Figure 7), we first adopt a 50-kilometers buffer. An alternative threshold at 100 kilometers will be explored as further robustness check.

[10] Uganda Bureau of Statistics (2013). Uganda National Panel Survey 2010/2011 Wave II report. June 2013.

[11] As discussed by Maystadt and Verwimp (2014), the parameter of the decay function can be modified to give more or less weight to proximity. We will follow their robustness check in dividing the number of refugees by the squared or the square root of the distance of their settlements to the clusters.

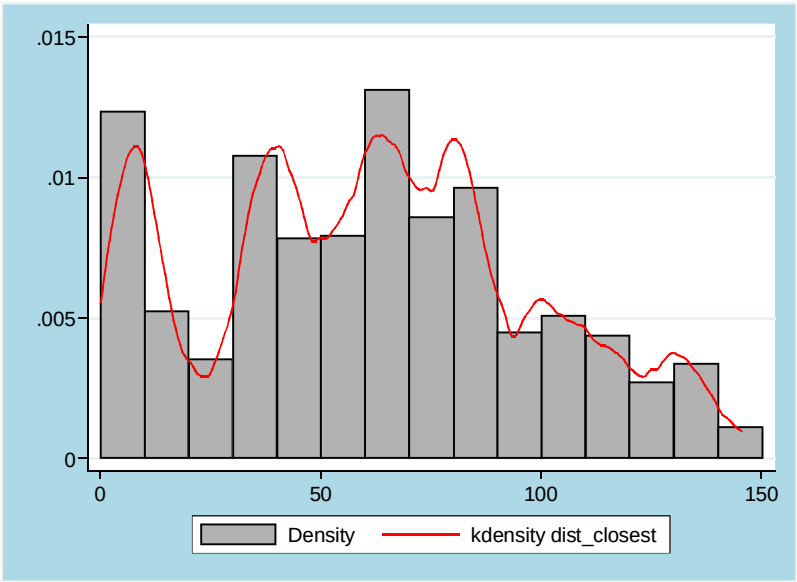


Figure 7: Kernel density (with histogram) showing the distribution of households at distances from closest refugee settlements (Panel 2009-2012)

We then exploit the spatial and time variation in the presence of refugees and the related changes in several outcomes of interest. Such variation is obtained through the use of fixed effects to account for unobserved heterogeneity across the households. For this strategy, the regression model follows a two-way fixed effect specification:

$$Y_{ihct} = \beta_1 Refugee_{ct} + \alpha_t + \alpha_{c|h} + \beta_2 X_{it|ht|ct} + \beta_3 H_{ht} + \beta_4 Q_{ct} + \varepsilon_{itc} \quad (1)$$

Each outcome variable *Y* of household/individual *i* in year *t* and cluster *c* is regressed on the refugee index *Refugee* in year *t* and cluster *c*. To ease interpretation, the refugee index is transformed into logarithm (adding one in case of zero values). We use Ordinary Least Squares as the main method of estimation. To deal with the so-called Moulton problem (Cameron & Miller, 2015; Abadie et al., 2017), we cluster the standard errors at the EAs level.

Causal identification is nonetheless a challenge given the potentially endogenous nature of the presence of refugees. Indeed, the localization of settlements as well as the number of refugees they host can be influenced by unobserved attractiveness of the considered area. Refugees are likely to be located in peripheral areas, mostly rural. These areas may feature less dynamic labor markets, pushing e.g. the coefficient between the presence of refugees and some welfare indicator downward. The descriptive statistics indicate that the level of welfare tends to be lower in refugee-hosting districts

and it would not be surprising these areas would have grown slower than other areas in absence of refugees. To cope with this identification concern, we first control for observed and unobserved heterogeneity.

To manage the issue of unobserved heterogeneity, we consider a set of fixed effects. First, we include year fixed effects (α_t) to account for any unobserved changes overtime common to the households. One could for example expect the world market or national policies to play an important role in affecting our outcome variables. Second, we add cluster fixed effects (α_c) to control for any unobserved factors common for households within the same EA but different across clusters even within the same district. That is particularly important since our descriptive statistics indicate that refugee-hosting and non-hosting clusters differ in several dimensions. For instance, the difference in main source of income, labor force participation, or agricultural production could be explained by cluster specific factors such as traditional practice, mean temperature, precipitation, or majority land cover, among others. Also, in augmented specifications, we replace the cluster fixed effects by household fixed effects which control for any time-varying unobserved characteristics unique to households. At the risk of changing the population of interest (oversampling large households for instance) and reducing the efficiency of our estimates by reducing considerably variations between units of observations, the inclusion of household fixed effects can shed light on possible endogeneity bias arising from location selection of refugee settlements.

Another set of controls is constituted by a vector of household and individual characteristics. The individual covariates include the age, sex, and the square of age. We also augment the specifications with less pre-determined covariates, notably the household size, marital status, highest completed education level, the household's main source of income, ownership of land and alternative sources of income. In all regressions, we account for the sampling weights to render the estimates nationally representative and independent of the sampling design. We proceed in a stepwise manner as well, adding controls to successive regressions to avoid the risk of "bad" controls (Angrist & Pischke, 2008).

Despite the use of control variables, there are still remaining concerns about the endogeneity of the presence of refugees. For instance, the number of refugees in a given area might be influenced by the attractiveness of the considered area and possible related changes. To deal with that concern, we use an instrumental variable approach. We construct a shift-share instrument based on the mean distance of the refugee settlements to the closest border crossing points. Formally, our instrument can be described as follows:

$$IV_{ct} = \sum_{O} Refugee_{Ot} * \left(\frac{1}{Distance_{cO}}\right)$$

Where *c* is the cluster/EA, *t* is the year and *O* is the refugee's country of origin. For this instrument to be valid, it has to influence our outcome variables only through the presence of refugees. In other words, this instrument has to be a good predictor of the number of refugees within a given cluster while remaining uncorrelated with the error terms. Our assumption to satisfy this exclusion restriction is that the distance between any given cluster and the border point through which refugees come into Uganda is completely independent from the outcome variables. We further relax that assumption in Section 5.2. By linking that distance with the number of refugees from country *O* within the cluster *c*, and summing up over all possible *O*, we obtain a good predictor of the total number of refugees within cluster *c* at time *t*. However, we will discuss further the plausibility of our identifying assumption in Section 5 (Sub-section 5.2).

According to Figure 1, there are 17 source countries registered in the UNHCR refugees data set. Only 7 countries account for 99.7% of the total number of refugees in Uganda (excluding refugees in Kampala whose source country is not known) in the study period. We focus on these 7 countries to construct the IV.[12]

[12] More specifically, these 7 countries include Sudan/South Sudan, DRC, Rwanda, Burundi, Somalia, Eritrea and Ethiopia. Despite its border with Uganda and having more than 1,000 refugees over the study period, Kenya is not included in the IV analysis as it contributes only about 0.002% of the total. In addition, the refugee border crossing points are lined only along the northern, western and southern borders of Uganda. It is thus difficult to assume that Kenyan refugees had to first cross one other international border before crossing into Uganda. Yet, this assumption can be made for refugees from Somalia, Ethiopia, and Eritrea (assuming they would enter Uganda through South Sudan).

5. Results

5.1. Effects of refugee presence on household welfare

According to the OLS specifications (Table 3, Panel A), the presence of refugees is positively correlated with the household welfare represented by the consumption aggregate per adult equivalent. Within the 50km buffer, the correlation is statistically different from zero (Table 3, Panel A; Columns 1-3) until household fixed effects are controlled for when the coefficient loses statistical significance (Table 3, Panel A; Column 4).[13] The stability of the coefficient gives us a first hint that the efficiency of our estimates is affected by the requiring addition of household fixed effects, but not its consistency. The instrumental variable analysis confirms a positive effect of the refugee presence on the household welfare (Table 3, Panel B). The coefficient in the regression specifications with all controls including year and cluster fixed effects (column 3) is quantitatively similar to the coefficients in the regression specifications with year and household fixed effects (column 4). Doubling the presence of refugees would increase the consumption aggregate per adult equivalent by about 7.38% for households within 50km of the closest refugee settlements (Table 3, Panel B; column 4). This effect size is similar to Maystadt and Verwimp (2014) with their estimated 8% increase in consumption per adult equivalent.

Table 3: Effects of refugee presence on household welfare with analysis at cluster level and the distance weighted-refugee index at 50km from the clusters (Panel 2009-2012)

	Dep. Var. : Log of welfare (consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
	Panel A (OLS)			
Log of refugees (50km)	0.0235**	0.0236**	0.0273**	0.0217
	(0.0108)	(0.0108)	(0.0133)	(0.0144)
Observations	5,453	5,450	4,105	4,102
R-squared	0.3897	0.3899	0.3839	0.7172
	Panel B (2SLS 2nd Stage)			
Log of refugees (50km)	0.03226	0.03207	0.07808*	0.07384*
	(0.04466)	(0.04459)	(0.04453)	(0.04302)
Observations	5,453	5,450	4,105	4,102
Kleibergen-Paap rk Wald F	19.34	19.33	14.62	14.15
Root MSE	0.593	0.593	0.533	0.362
	Panel C (2SLS 1st Stage)			
	Dep. Var. Log of refugees (50km)			
Log of Distance IV (mean border distance)	9.24792***	9.24997***	8.71514***	8.68000***
	(2.10281)	(2.10376)	(2.27960)	(2.30744)

[13] For the 100km buffer, controlling for observed heterogeneity does not seem to affect our main variable of interest (Appendix 3, Table A8; Columns 1-3). However, the coefficient becomes only statistically different from zero when household fixed effects are included (Appendix 3, Table A8; Column 4).

Observations	5,453	5,450	4,105	4,102
Root MSE	0.581	0.582	0.612	0.593
Included controls				
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*

*Notes: Panel A are the results from the OLS, Panel B represents the second stage of the IV regression and Panel C shows the first stage results from the IV regression. Apart from HH size, the more endogenous controls added are as at the base year of the study. In Regression (4) where household fixed effects replace the cluster fixed effects, all the time invariant variables drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. The detailed results are presented in Tables A7, A9, and A10.*

Several robustness tests confirm the positive effects of the refugee presence on the household welfare. For instance, when constructing the instrumental variable, the parameter of the decay function was modified to give more or less weight to the proximity between the country of origin border point and the destination clusters. The IV regressions with the instruments constructed by dividing the number of refugees from country *O* by the square or the square root of the distance between border points and the clusters also show similar elasticities between 0.08 and 0.14, for households within 50km and 100km of the closest refugee settlements.[14] Even when Kampala district is included in the analysis, the estimated coefficient remains in the same range across the decay functions of the instrument, for households within the 50km and 100km of the closest refugee settlements.[15] In our main results we do use the average distance to border crossing points for each cluster to construct the instrumental variables. Using the distance to the closest crossing point would not alter much the result, only pushing upward the estimated second-stage coefficient of interest.[16]

The results therefore show that the presence of refugees has a significantly positive effect on household welfare. Living closer to refugee settlements is beneficial to the host populations.

5.2. The identifying assumption

The causal identification of a positive impact of refugees on the hosts' welfare rests on key identifying assumptions. First, the instrument is sufficiently relevant as shown by the relatively high values – above 14 – in the Kleibergen-Paap rk Wald F statistics (see Panel B of Table 3). Second, we assume

[14] See Appendix 4, Tables A9 & A11; columns 8 & 12. The first stage results are reported in Tables A10 & A12 respectively.
[15] See Appendix 4, Tables A13 & A15; columns 4, 8 & 12. The first stage results are reported in Tables A14 & A16 respectively.
[16] See Appendix 4, Tables A17 & A19; column 4, 8 & 12). The first stage results are reported in Tables A18 & A20 respectively.

that the instrumental variable does not impact consumption per adult equivalent by another channel than the presence of refugees, the so-called exclusion restriction. With our distance-based shift-share instrument, one of the main threats to the exclusion restriction is the fact that other time-varying factors would be correlated with the proximity to the border. One major threat would come from conflict in neighboring countries driving both forced migration and the economic lives of people living in areas close to borders. For instance, trade channels have been shown to have non-trivial impact across borders (Bayer & Rupert, 2004; Glick & Taylor, 2010). Spillovers may also arise from the so-called peace dividends. For instance, the return of South Sudan to relative stability coincide with large increase of exports in bordering areas in North-Western Uganda (Brenton & Isik, 2012). Therefore, controlling for conflict spillovers can help to show that the distance variable in our IV is an excludable weighting measure allowing the IV to properly predict the number of refugees being hosted in particular localities, without capturing alternative channels such as changing trade.

We use the Armed Conflict Location & Event Data (ACLED) to create a conflict fatalities index which we apply as a proxy for conflict spillovers (Raleigh et al., 2010). The assumption is that conflicts resulting in fatalities capture the intensity of the violence towards potential migrants and large disruption to trade or economic activity in neighboring countries/regions. The conflict spillover index measures the number of fatalities from the conflict events in neighboring countries, in a particular year, taking place in the areas nearest to the refugee hosting country, weighted by the distance from the conflict area to the clusters in the refugee hosting country. Initially we construct this conflict spillover index by restricting the conflict source countries to the neighboring countries including refugee source countries (i.e. Burundi, DRC, Eritrea, Ethiopia, Rwanda, Somalia, South Sudan, Sudan, Tanzania, Kenya). Later we further restrict the sample to only include the closest neighbors and closest trade partners that are, Burundi, DRC, Rwanda, South Sudan, Tanzania and Kenya.

Table 4 shows that controlling for conflict spillovers does not significantly affect the main coefficient of interest. This is suggestive evidence that the exclusion restriction is likely to be satisfied.

Table 4: Effects of refugee presence on household welfare with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012). Additional test for Exclusion restriction in columns (5) to (8).

	Log of welfare (consumption aggregate per adult equivalent)							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A (2SLS 2nd Stage)							
Log of refugees (50km)	0.03226	0.03207	0.07808*	0.07384*	0.09030**	0.08324*	0.09800**	0.08859**
	(0.04466)	(0.04459)	(0.04453)	(0.04302)	(0.04473)	(0.04313)	(0.04532)	(0.04367)
Log of Conflict Spillover index					-0.64678**	-0.48240	-0.61513*	-0.43502
					(0.29807)	(0.33332)	(0.33319)	(0.38143)
Observations	5,453	5,450	4,105	4,102	4,105	4,102	4,105	4,102
Kleibergen-Paap rk Wald F	19.34	19.33	14.62	14.15	14.61	14.12	14.48	13.97
Root MSE	0.593	0.593	0.533	0.362	0.533	0.362	0.533	0.362
	Panel B (2SLS 1st Stage)							
	Log of refugees (50km)							
Log of Distance IV (mean border distance)	9.24792***	9.24997***	8.71514***	8.68000***	8.93810***	8.92130***	9.21248***	9.21480***
	(2.10281)	(2.10376)	(2.27960)	(2.30744)	(2.33830)	(2.37396)	(2.42096)	(2.46509)
Observations	5,453	5,450	4,105	4,102	4,105	4,102	4,105	4,102
Root MSE	0.581	0.582	0.612	0.593	0.610	0.592	0.610	0.591
Included controls								
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*
Fatalities (Conflict Spillover)	*No*	*No*	*No*	*No*	*Yes*	*Yes*	*Yes*	*Yes*

*Panel A are the results from the OLS, Panel B represents the second stage of the IV regression and Panel C shows the first stage results from the IV regression. Apart from HH size, the more endogenous controls added are as at the base year of the study. In Regression (4) where household fixed effects replace the cluster fixed effects, all the time invariant variables drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Column (5)-(8) include conflict spill over as control. (5) & (6) considers all neighboring and refugee source countries while (7) & (8) consider only the closest neighboring countries irrespective of being refugee source countries or not. (5) & (7) involve Cluster FE while (6) & (8) involve HH FE. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.*

5.3. Distributional effects

In order to identify distributional effects, we run IV regressions on split samples disaggregated by the household head's initial level of education, main source of income and land ownership.

Education. Table 5 suggests that the positive effect of refugees is mostly driven by households whose heads did not complete primary school level in the base year of the study period (Panel A). However, the point estimate is not precisely estimated when observed heterogeneity (column 3) and household fixed effects (column 4) are controlled for. Moreover, a t-test shows that the difference between the coefficients is not statistically significant. Education level of the household head therefore does not seem to matter for the effects of refugee presence on household welfare.

Table 5: Second stage: Effects of refugee presence on household welfare disaggregated by initial education level, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
	Panel A (Didn't complete primary schooling)			
Log of refugees (50km)	0.09736*	0.09596*	0.12497	0.11212
	(0.05594)	(0.05540)	(0.07754)	(0.06946)
Observations	3,224	3,224	2,616	2,614
Kleibergen-Paap rk Wald F	12.54	12.55	8.298	8.177
Root MSE	0.544	0.543	0.509	0.372
	Panel B (Completed primary schooling)			
Log of refugees (50km)	0.02190	0.01969	0.00903	0.03060
	(0.04250)	(0.04211)	(0.04793)	(0.04568)
Observations	2,015	2,014	1,489	1,488
Kleibergen-Paap rk Wald F	14.45	14.45	12.47	12.24
Root MSE	0.546	0.540	0.476	0.340
T-stat (*comparing corresponding coeffs in Panels A & B*)	0.9633	0.9829	1.0641	0.8292
$t_{0.05,\infty}$	1.96	1.96	1.96	1.96
$t_{0.1,\infty}$	1.645	1.645	1.645	1.645
Included controls				
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*

*Apart from HH size, the more endogenous controls added are as at the base year of the study. In Regression (4) where household fixed effects replace the cluster fixed effects, all the time invariant variables drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.*

Occupation. For the effect of refugee presence on welfare of households disaggregated by main source of income in the base year, Table 6 depicts an increase in welfare by about 8% for households within 50km of the closest refugee settlements and whose initial main source of income is subsistence

farming (Panel A). These positive effects are robust to the choice of the decay function in the construction of the IV.[17]

This effect is compatible with households mainly relying on subsistence farming prior to the arrival of refugees (see descriptive statistics) and potentially responding to an increasing demand for some agricultural products from refugee settlements. Market expansion induced by refugees would allow subsistence farmers to sell some of their home production and diversify their sources of livelihood. Alix-Garcia and Saah (2009) similarly find that, compared to urban households, rural households closer to refugee camps experience a positive wealth effect which could be resulting from production and supply of non-aid food products in response to the upward price shifts. We could not find any significant effect on those initially involved in commercial farming, wage employment and non-agricultural employment. But the reduction of sample sizes and the weakness of the first-stage regressions do not allow us to draw any firm conclusion.

Table 6: Second stage: Effects of refugee presence on household welfare disaggregated by initial main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
	Panel A (Subsistence farming)			
Log of refugees (50km)	0.08035	0.08138	0.09170*	0.08407*
	(0.05125)	(0.05133)	(0.04793)	(0.04368)
Observations	2,850	2,849	2,532	2,532
Kleibergen-Paap rk Wald F	14.35	14.34	14.20	13.85
Root MSE	0.533	0.530	0.513	0.366
	Panel B (Commercial farming)			
Log of refugees (50km)	0.57362	0.45739	0.31604	0.21158
	(0.91898)	(0.78486)	(0.71053)	(0.55641)
Observations	148	148	133	133
Kleibergen-Paap rk Wald F	1.771	1.740	1.298	1.508
Root MSE	0.434	0.408	0.374	0.344
	Panel C (Wage employment)			
Log of refugees (50km)	0.02290	0.02291	-0.02186	0.02644
	(0.07035)	(0.07011)	(0.12617)	(0.11184)
Observations	843	842	533	533

[17] Table A23 (Appendix 4) shows that the effect size varies from 8% to 10% depending on the choice of the decay function (Panel A). Within the 100km buffer, the effect of refugee presence on welfare of households whose initial main source of income is subsistence farming varies from 11% to 16% depending on the decay function of the IV (Appendix 4, Table A24; Panel A).

Kleibergen-Paap rk Wald F	9.851	9.829	7.005	7.251
Root MSE	0.517	0.513	0.437	0.367
	Panel D (Non-agriculture self-employment)			
Log of refugees (50km)	0.03556	0.03295	0.04755	0.04190
	(0.08114)	(0.07635)	(0.14670)	(0.15579)
Observations	1,068	1,067	669	667
Kleibergen-Paap rk Wald F	8.789	8.719	4.676	4.530
Root MSE	0.515	0.511	0.414	0.327
Included controls				
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*

*Apart from HH size, the more endogenous controls added are as at the base year of the study. In Regression (4) where household fixed effects replace the cluster fixed effects, all the time invariant variables drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.*

Land ownership. The presence of refugees is potentially beneficial to the welfare of households who initially owned land smaller than or equal to the median size of 2.5 acres of land. The coefficients are relatively large and positive though only statistically different from zero when household fixed effects are controlled for (Table 7, Panel A; column 4).[18]

Subsistence farmers usually own smaller sizes of land and therefore it is likely that there is a correlation between the results based on initial land size and those on initial main source of income. A t-test also shows that the difference between the coefficients in corresponding panels is not statistically significant. Ownership of land as defined in this study therefore does not seem to matter for the effects of refugee presence on household welfare.

[18] With the IV decay function which places more emphasis on the proximity between clusters and border points, we find that the coefficients remain statistically significant (Appendix 4, Table A25, Panel A; columns 5-8). Therefore, for households who initially owned less than or equal to 2.5 acres of land and are living within 50km of the refugee settlements, the likely increase in their consumption per adult equivalent is between 8% and 11% (Appendix 4, Table A25; Panel A). Similar effects are observed within the 100km buffer where the likely increase in their consumption per adult equivalent is between 12% to 19% (Appendix 4, Table A26; Panel A).

Table 7: Second stage: Effects of refugee presence on household welfare disaggregated by initial land ownership, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
	Panel A (Own <= median land size "2.5 acres")			
Log of refugees (50km)	0.07818	0.07681	0.08618	0.09122*
	(0.05174)	(0.05145)	(0.05350)	(0.05023)
Observations	2,124	2,124	1,981	1,980
Kleibergen-Paap rk Wald F	11.99	11.96	12.08	11.94
Root MSE	0.526	0.526	0.506	0.378
	Panel B (Own > median land size "2.5 acres")			
Log of refugees (50km)	0.01440	0.02057	0.02718	0.03440
	(0.05408)	(0.05455)	(0.05567)	(0.05698)
Observations	2,170	2,168	2,124	2,122
Kleibergen-Paap rk Wald F	13.41	13.38	13.09	13.08
Root MSE	0.508	0.505	0.493	0.340
T-stat (*comparing corresponding coeffs in Panels A & B*)	0.8517	0.7495	0.7622	0.7439
$t_{0.05,\infty}$	1.96	1.96	1.96	1.96
$t_{0.1,\infty}$	1.645	1.645	1.645	1.645
Included controls				
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*

*Apart from HH size, the more endogenous controls added are as at the base year of the study. In Regression (4) where household fixed effects replace the cluster fixed effects, all the time invariant variables drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.*

Overall, the heterogeneous analysis presents somehow surprising results. There is a relatively large consensus that hosting refugees creates relative winners and losers within the hosting population. Although research on the distributional impact of forced displacement remains scarce (Verme & Schuettler, 2021), quantitative and qualitative studies usually converge in identifying households with access to human and physical capital as those most likely to adapt to the refugee shock and respond optimally to changing economic opportunities (Maystadt et al., 2019). Our results are sufficiently puzzling to call for further investigation of possible mechanisms behind these redistributive effects of benefits/losses.

6. Discussion on possible coping strategies[19]

There are several channels in the literature through which refugees might affect the welfare of households in host communities. For instance, some argue that influx of refugees induces a supply of cheap agricultural labor for commercial farmers and also fosters competition for agricultural wage workers within the hosting communities (Maystadt & Verwimp, 2014). While others suppose that refugees create a market for agricultural goods and thus benefit those involved in the production of these goods (Alix-Garcia & Saah, 2009). In the literature, therefore, the majorly discussed channels of refugees' influence on household welfare are the labor market and the agriculture sector.

Occupation choice. The above findings (Sub-section 5.3) generally suggest that presence of refugees is more beneficial to the rural households, initially involved in subsistence farming.[20] One possible explanation is that subsistence farmers, who are mainly consuming what they produce and are relatively poor, sell off their home production to diversify and improve their well-being. Further investigation reveals such dynamics where some households change occupation over time. That is, a household whose initial main source of income is subsistence farming could switch to rely mainly on another more lucrative source of income in the consecutive years given the refugee situation.

In this investigation, firstly we correlate welfare and refugee presence given the time varying main occupation for households. The initial main sources of income are included as controls. We do not introduce household fixed effects in these estimations since that would correspond to looking at the change of a change in occupation in an heterogeneous framework. Due to a lack of statistical power, the analysis on the coping strategies also does not involve the instrumental variable approach. The analysis should receive a correlational interpretation, not a causal one (naturally, the change of occupation may be a result of the change in welfare). Table 8[21] shows that the few households who rely on commercial farming seem to benefit more.

[19] Estimates in this section are estimated without instrumentalization due to the weakness of the corresponding instrumental variables when interaction terms are used and hence, two endogenous variables need to be dealt with. The corresponding Kleibergen-Paap rk LM statistics are indeed below one. Caution needs to be made not to interpret causally these results.

[20] Further investigation reveals that indeed rural households emerge as beneficiaries compared with urban households (Appendix 4, Tables A27 & A28). However, the sample sizes when restricting the analysis to urban households is too limited to draw inference.

[21] Details in Appendix 4; Table A29.

Table 8: OLS: Effects of refugee presence on household welfare disaggregated by time-varying main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)		
	(1)	(2)	(3)
Log of refugees (50km)	0.0219*	0.0219*	0.0263*
	(0.0114)	(0.0114)	(0.0136)
Log of refugees(50km)#Commercial farming	0.0515*	0.0515*	0.0770***
	(0.0280)	(0.0279)	(0.0276)
Log of refugees(50km)#Wage employment	0.0143	0.0141	0.0032
	(0.0121)	(0.0121)	(0.0129)
Log of refugees(50km)#Non-Agric self-employment	-0.0136	-0.0136	-0.0010
	(0.0127)	(0.0127)	(0.0115)
Observations	5,453	5,450	4,105
Root MSE	0.3966	0.3967	0.3911
Included controls			
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*
Household fixed effects	*No*	*No*	*No*

For our second investigation, we correlate welfare and refugee presence interacted with an indicator equal to one if the household moves to a particular main source of income. The results then suggest that households which changed from their initial main source of income to commercial farming and wage employment likely benefit more from the influx of refugees (Table 9).[22] Overall, these results suggest that households respond to the market dynamics created by the influx of refugees by switching to commercial farming in order to increase their welfare. Given our descriptive statistics (Table 1), we should nonetheless acknowledge than less than 1 percent of the households in refugee-hosting areas generate their income mainly from commercial farming. While such a coping strategy certainly offers large pay-offs, it remains limited in scope.

Table 9: OLS: Effects of refugee presence on household welfare disaggregated by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)		
	(1)	(2)	(3)
Log of refugees (50km)	0.0183	0.0183	0.0175
	(0.0132)	(0.0131)	(0.0188)
Log of refugees(50km)#To Commercial farming	0.0772**	0.0772**	0.0731**
	(0.0313)	(0.0313)	(0.0306)
Log of refugees(50km)#To Wage employment	0.0206	0.0206	0.0400**
	(0.0166)	(0.0167)	(0.0172)

[22] Details in Appendix 4; Table A30.

Log of refugees(50km)#To Non-Agric self-employment	-0.0048	-0.0046	0.0129
	(0.0153)	(0.0153)	(0.0209)
Observations	3,734	3,734	2,763
Root MSE	0.4057	0.4059	0.4213
Included controls			
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*
Household fixed effects	*No*	*No*	*No*

In order to further understand this coping strategy, we further investigate the agriculture channel. We define a variable capturing the level of agricultural production, that is, total agricultural production across both agricultural seasons.[23] These variables are all log transformed before inclusion in the model specification. We redefine the model specification (1) above by including the following controls: whether or not the household experienced shocks in the last 12 months, the distance to the nearest major road, the distance to nearest population center, the distance to the nearest market, the distance to the nearest land border crossing, the distance to the headquarters of district of residence, the annual mean temperature, the annual cumulative precipitation, the average 12 months total rainfall, the percent agriculture within approximately a 1km buffer, and the majority of land cover class within approximately a 1km buffer.

Table 10[24] shows that the few households which switch to commercial farming potentially have higher total agricultural production. These results firstly support the argument that agriculture is an important channel through which the welfare of households living in refugee hosting areas is affected.

Table 10: OLS: Effects of refugee presence on household welfare disaggregated by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of Total Agricultural Production (UGX)		
	(1)	(2)	(3)
Log of refugees (50km)	-0.0012	0.0054	0.0089
	(0.0258)	(0.0257)	(0.0284)
Log of refugees(50km)#To Commercial farming	0.2430**	0.2360*	0.2015**
	(0.1172)	(0.1266)	(0.0824)
Log of refugees(50km)#To Wage employment	-0.0097	-0.0184	0.0128
	(0.0367)	(0.0362)	(0.0314)
Log of refugees(50km)#To Non-Agric self-employment	0.0468	0.0397	0.0620*
	(0.0365)	(0.0359)	(0.0344)

[23] We disaggregate the level of agricultural production by calculating the total harvest of fruits, vegetables and cereals across both agricultural seasons. The total harvests of fruits, vegetables and cereals are converted in monetary terms, that is Uganda shillings (UGX), before the values are aggregated to determine the total household agricultural production. The detailed classification of the food categories is given on the last page in the annexed Appendix.

[24] Details in Appendix 4; Table A31.

Observations	3,124	3,123	2,641
Root MSE	0.3602	0.4005	0.4894
Included controls			
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*
Household fixed effects	*No*	*No*	*No*

The findings also imply that switching the main source of income for these households is an important coping strategy. Further, the results show that households who switch from their initial occupation to commercial farming are likely to benefit because they increase their total agricultural production (Table 10). We also discover that these potential benefits from agricultural production which accrue to households which switch to commercial farming as their main source of income possibly come from the increase in total production of vegetables (Table A32; Appendix 4).[25] Ruiz and Vargas-Silva (2016) suggest that refugees working within the agriculture sector may not necessarily leave the sector in response to the refugee shock but can change the types of crops they were cultivating. Alix-Garcia and Saah (2009) also explain that positive wealth effects accrue to households who respond to increasing prices by increasing production of particular agricultural products, especially the non-aid food items. These increasing prices are driven by increasing demand for these non-aid food items. In Uganda, the basic food aid basket given to refugees comprises maize, cow peas, salt, beans and cooking oil (Betts et al., 2017), and from anecdotal evidence, rice and sorghum occasionally feature in the food basket. When the preferred food items are not given freely, the refugees incur a cost to obtain the foods which they would rather consume. For instance, Somali refugees in Uganda can trade their aid-maize-rations for cash, in order to buy their preferred foods which are pasta and rice (Betts et al., 2017). Moreover, Betts et al., (2017) further highlight trade opportunities within refugee economies where neighboring villages sell their products including vegetables to refugees. These accounts support the argument of improved welfare for host households who switch to commercial farming and perhaps specifically those who produce more vegetables.[26]

[25] We do not find significant correlations with total production of fruits and cereals (Tables A33 & A34; Appendix 4).

[26] Important to note as well is the definition of a commercial farmer in this context. Usually commercial farming encompasses 2 major aspects among other things; the main purpose being to sell the produce and the physical capital requirement being large area of land. The results in Tables A31 to A34 (Appendix 4) show a positive correlation between agricultural production and the ownership of land larger than the median size. However, the results in Table A35 (Appendix 4) suggest that the decision to switch to commercial farming perhaps does not drive the need to own a larger area of land at least in the immediate future. The reverse could also be true that the switch to commercial farming in this context is not majorly driven by the size of land owned. Since with the LSMS-ISA, the classification of the main source

From these findings, we qualify our previous conclusions. Households initially involved in subsistence agriculture seems to have benefited from the presence of refugees and possibly, from the Ugandan policy towards refugees. Our analysis does not lend itself to a static framework. The few who were able to switch from subsistence farming or any other initial main source of household income to commercial farming benefited more from the market advantages. Moreover, the market advantages could be more apparent for those farmers who engage in commercial vegetable production.

Labor market participation. Additionally, it also seems that host households who switch to wage employment also benefit from the refugee influx (Table 9). The correlation is only statistically significant when all controls are included. In an attempt to understand this potential effect, we analyze the effect of refugee presence on some individual labor market outcomes including labor force participation in the last 12 months.

Table 11 shows that there is a decreased participation into the labor force as a result of the refugee inflows (Panel A). The coefficient is statistically different from zero and implies that because of the refugee presence, hosting communities engage less on the labor market. This first result is confirmed by the decline in the number of worked months (Panel B) which indicates a negative change in the labor market both at the extensive and intensive margins. But these changes at the individual level are in contradiction with the previous findings at the household level. Also, in the absence of any variation in the received/generated income (Panels C, D and E), we further investigate the different type of employment.

Table 11: Effects of refugee presence on labor market outcomes, with an OLS analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	(1)	(2)	(3)
	Panel A: Labor force participation (12 months)		
Log of refugees (50km)	-0.0148*	-0.0147*	-0.0164*
	(0.0083)	(0.0082)	(0.0085)
Observations	16,805	16,805	10,198
R-squared	0.0917	0.1470	0.1844
	Panel B: Worked months (12 months)		
Log of refugees (50km)	-0.0499	-0.0288	-0.0720**
	(0.0455)	(0.0354)	(0.0351)
Observations	8,010	8,010	5,577
R-squared	0.1230	0.2045	0.1704

of household income is merely reported and not observed, this could imply that most households would classify themselves as commercial farmers solely based on the main purpose of planting.

	Panel C:Annual income in cash (log)		
Log of refugees (50km)	-0.0506	-0.0514	-0.0578
	(0.0556)	(0.0559)	(0.0537)
Observations	16,016	16,016	9,873
R-squared	0.1395	0.1403	0.1651
	Panel D:Annual income in kind (log)		
Log of refugees (50km)	0.1382	0.1377	0.1994
	(0.1866)	(0.1863)	(0.1582)
Observations	15,976	15,976	9,861
R-squared	0.2589	0.2592	0.2976
	Panel E:Average monthly revenue from non-ag. activities (log)		
Log of refugees (50km)	-0.0093	-0.0086	-0.0382
	(0.0578)	(0.0576)	(0.0486)
Observations	7,581	7,581	4,676
R-squared	0.3054	0.3073	0.3438
Included controls			
Exogenous controls (age, sex)	*No*	*Yes*	*Yes*
Other controls (HHsize, marital status, education, occupation, income source)	*No*	*No*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*
Household fixed effects	*No*	*No*	*No*

To do so, we use the variables capturing whether an individual is a wage worker, self-employed, an unpaid or a family worker.[27] We decompose the previous results from Table 11 into these employment categories by interacting each of the variables with the refugee index.

Table 12: Decomposition of the OLS effects of refugee presence on labor market outcomes, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	(1)	(2)	(3)
	Labor force participation (12 months)		
Log of refugees (50km)	-0.00738	-0.00802	-0.01587**
	(0.00681)	(0.00669)	(0.00781)
Log of refugees(50km)#Wage workers	0.01975***	0.01959***	0.01368***
	(0.00610)	(0.00607)	(0.00444)
Log of refugees(50km)#Self-employed	0.01836***	0.01794***	0.01296***
	(0.00584)	(0.00568)	(0.00447)
Log of refugees(50km)#Unpaid workers	0.00980*	0.00996*	0.00630
	(0.00587)	(0.00578)	(0.00434)
Log of refugees(50km)#Family workers	-0.00049	0.00028	0.00642
	(0.00451)	(0.00444)	(0.00619)
Observations	14,801	14,801	10,146
Root MSE	0.208	0.206	0.171
Included controls			
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources)	*No*	*No*	*Yes*

[27] We ignored the apprenticeship category which has a very low number of observations.

Year fixed effects	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*
Household fixed effects	*No*	*No*	*No*

In Table 12 we observe that individuals who are wage workers and self-employed in non-agricultural work do engage more in the labor market within communities that are closer to refugee settlements. This could explain why households who switch to wage employment are also likely to benefit. Moreover, having household members involved in an alternative income generating activity can enable households to switch from one main source of income to another. This is consistent with the results found in Table 9 where households shifting to commercial farming (a sector prone to self-employment) and wage employment were experiencing higher welfare.

7. Conclusion

The consequences that come with hosting refugees are driven by several factors which encompass the refugee policy in the hosting country, the sheer number of refugees being hosted, the duration of stay of the refugees and the coping strategies which the hosts employ given the refugee shocks, among others. Sub-Saharan Africa (SSA) has to cope with a large and rising number of refugees who live for protracted durations in their host countries. Therefore, understanding the consequences of hosting refugees in SSA has increasingly gained attention in the literature. Several studies have highlighted a net economic benefit. In this study, we contribute to the literature by exploring the potential channels of refugee influence on household welfare and the possible coping strategies employed by the refugee hosting households.

Our study centers on Uganda which has a unique refugee policy. The country hosts the most refugees in SSA and is the third largest refugee hosting nation globally. We use panel data to determine the effect of refugee presence on household welfare based on consumption per adult equivalent between 2009 and 2012. The refugees originate from various source countries. We concentrate our analysis at the enumeration area/cluster level and use a constructed refugee index which weights the number of refugees in the closest refugee settlements by the inversed distance from those settlements to the clusters. This is intended to capture the relative importance of proximity to the refugee settlement rather than the usual classification of refugee hosting districts versus non-refugee hosting districts. We employ a shift-share instrumental variable, which is based on the distance of to the closest border crossing points for each source country, in order to limit endogeneity concerns.

Our results indicate that the presence of refugees causes significant welfare benefits especially for households living closer to refugee settlements. However, it is the rural households, initially involved in subsistence agriculture who benefited from the refugee presence. Uganda is a case in point here. It contrasts with previous studies pointing to households with access to human and physical capital as those most likely to adapt to the refugee shock and respond optimally to changing economic opportunities (Maystadt et al. 2019). Our results indicate that those involved in subsistence agriculture benefit the most. Welfare improvements in refugee-hosting districts also correlate with a switch to commercial agriculture and to some extent wage employment. The way households are able to benefit is possibly through increased agricultural production, especially vegetable production for those who switch to commercial farming and increased labor force participation with reduced competition for those who switch to wage employment. The second effect is confirmed by the analysis at the individual level which shows that household members indeed participate more in the

labor market as wage workers and self-employed persons. These occupational transitions remain beneficial coping strategies for too few households. Further (qualitative and comparative) research is required to investigate the specificities of the Ugandan framework and context in facilitating these occupational transitions and how policies could incentivize these transitions even further. Indeed, this would help to inform policy on how potential losers can be assisted to adopt beneficial coping strategies.

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Supplementary Information for "How to Cope with a Refugee Shock? Evidence from Uganda"

Appendix 1: Refugee information

1a. Cumulative aggregates and averages of refugees received in Uganda.

Table A1: Total number of refugees by country of origin, also disaggregated by sex.

Country of Origin	Total No. of refugees	Total of female refugees	Total of male refugees
Sudan	1508434	742727	765707
South Sudan	638272	365986	272286
Dem. Rep. of the Congo	486839	244147	242692
Rwanda	200406	98455	101951
Somalia	55942	25998	29944
Burundi	33477	16715	16762
Kenya	7871	3797	4074
Eritrea	4947	2261	2686
Ethiopia	1732	604	1128
Central African Rep.	67	32	35
Liberia	18	5	13
Nigeria	14	2	12
Congo	12	8	4
Malawi	9	0	9
United Rep. of Tanzania	6	6	0
Iran (Islamic Rep. of)	3	0	3
Sierra Leone	3	0	3
Refugees in Kampala	453,142	-	-
Total	**3,391,194**	**1500743**	**1437309**

The refugees in Kampala district are neither disaggregated by sex nor are their countries of origin specified

Table A2: Absolute numbers of refugees, also disaggregated by sex, settled in different districts in Uganda

District	*Total No. of refugees*	*Percentage of grand total*	*Total female refugees*	*Total male refugees*
Adjumani	953,759	28.12%	492,265	461,494
Arua	457,034	13.48%	217,018	240,016
Kampala	453,142	13.36%	-	-
Isingiro	450,113	13.27%	220,884	229,229
Moyo	279,067	8.23%	143,001	136,066
Hoima	223,474	6.59%	110,733	112,741
Yumbe	185,421	5.47%	120,524	64,897
Kyegegwa	154,868	4.57%	78,283	76,585
Masindi	68,927	2.03%	34,626	34,301
Kitgum	64,478	1.90%	32,521	31,957
Kiryandongo	59,811	1.76%	30,359	29,452
Kamwenge	29,681	0.88%	14,678	15,003
Kanungu	11,208	0.33%	5,724	5,484
Kisoro	211	0.01%	127	84
Grandtotal	***3,391,194***	***100%***	***1,500,743***	***1,437,309***

Table A3: The average number of refugees received per district across all the years of influx

District	mean	sd	years	min	max
Adjumani	56103.47	48993.92	17	6586	196798
Arua	32645.29	26268.05	14	447	69462
Hoima	17190.31	5464.05	13	6530	24247
Isingiro	32150.93	20620.73	14	410	67166
Kampala	56642.75	21793.95	8	26994	87979
Kamwenge	29681.00	-	1	29681	29681
Kanungu	11208.00	-	1	11208	11208
Kiryandongo	7476.38	4637.73	8	3437	14715
Kisoro	211.00	-	1	211	211
Kitgum	21492.67	5412.97	3	15382	25686
Kyegegwa	11912.92	6257.19	13	2473	18229
Masindi	13785.40	1378.57	5	11772	15466
Moyo	21466.69	12850.16	13	1611	35964
Yumbe	185421.00	-	1	185421	185421
Overall mean	**30278.52**				

1b. Annual trend of aggregate refugee settlement in the different districts of Uganda

Figure 1 illustrates that the general rise in the number of refugees received in Uganda is not necessarily homogeneous across all districts. The general rise is mostly explained by the total number of refugees received in Adjumani district, since most of the refugees who were received from 2012 onwards have been settled in the district. From 2010, Moyo district and Kampala district has also been gradually receiving an increased number of refugees. For other districts, the trends have rather been decreasing after 2005.

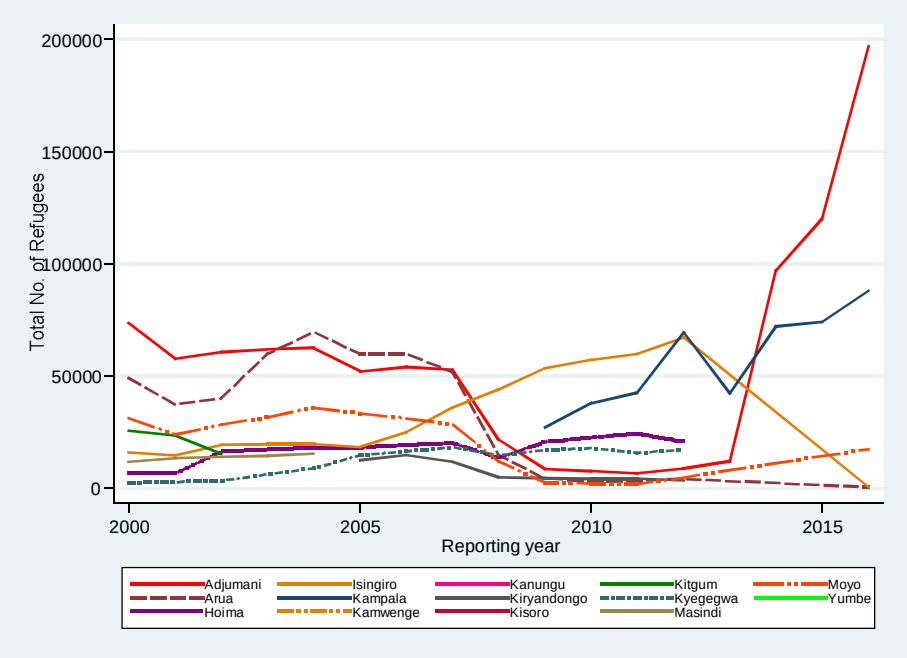
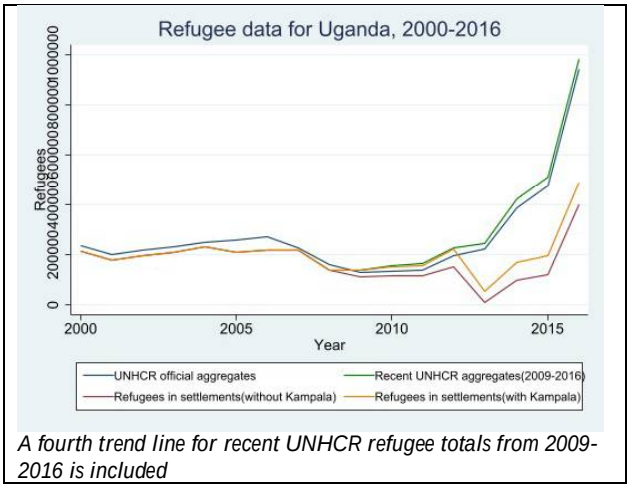


Figure A1: Annual trend of aggregate refugee settlement in the different districts of Uganda



A fourth trend line for recent UNHCR refugee totals from 2009-2016 is included

Figure A2: Graph showing the trends of refugee numbers in settlements alongside to the UNHCR official annual aggregates of refugees received in the country.

Appendix 2: Descriptive statistics

Table A4: Comparing socio-demographics at the individual's level for refugee's hosting and non-hosting districts (excluding Kampala)

		In the base wave=2009/10						*In the last wave=2012*					
Variables	**Levels**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**
Sex													
	Male	0.488	13160	0.497	1864	-0.009	0.012	0.477	15889	0.489	2193	-0.012	0.011
	Female	1.024	13160	1.005	1864	0.018	0.025	1.046	15889	1.022	2193	0.024	0.023
Age		20.221	12421	20.633	1764	-0.412	0.455	21.146	13336	21.769	1874	-0.623	0.474
Level of schooling													
	No formal education	0.304	5157	0.287	729	0.018	0.018	0.297	5174	0.246	769	0.051***	0.017
	Primary uncompleted	0.401	5157	0.405	729	-0.003	0.019	0.394	5174	0.424	769	-0.030	0.019
	Completed primary	0.209	5157	0.214	729	-0.005	0.016	0.212	5174	0.225	769	-0.013	0.016
	Secondary and above	0.086	5157	0.095	729	-0.009	0.012	0.097	5174	0.105	769	-0.008	0.012
Marital status													
	Married monogamously	0.288	8280	0.292	1197	-0.005	0.014	0.276	8421	0.280	1305	-0.004	0.013
	Married polygamously	0.086	8280	0.106	1197	-0.020**	0.009	0.090	8421	0.113	1305	-0.023**	0.009
	Divorced/widowed	0.100	8280	0.075	1197	0.024***	0.008	0.098	8421	0.077	1305	0.021***	0.008
	Never married	0.527	8280	0.526	1197	0.000	0.015	0.536	8421	0.531	1305	0.005	0.015

*Two sample t-test with unequal variances between refugee hosting and non-hosting districts. Significance level: *** p<0.01, ** p<0.05, * p<0.1*

Table A5: Comparing Income and non-agricultural output in the last 12 months at the individual's level for refugee's hosting and non-hosting districts (excl. Kampala)

Variables	Levels	*In the base wave=2009/10*						*In the last wave=2012*					
		Mean (Non-hosting)	Obs.	Mean (Hosting)	Obs.	Mean Diff.	Std. Error	Mean (Non-hosting)	Obs.	Mean (Hosting)	Obs.	Mean Diff.	Std. Error
Main source of income													
	Subsistence farming	0.560	12708	0.563	1805	-0.004	0.012	0.575	14760	0.616	2118	-0.041***	0.011
	Commercial farming	0.032	12708	0.029	1805	0.003	0.004	0.016	14760	0.017	2118	-0.001	0.003
	Wage employment	0.148	12708	0.143	1805	0.005	0.009	0.121	14760	0.148	2118	-0.027***	0.008
	Non-ag. Self-employment	0.198	12708	0.202	1805	-0.003	0.010	0.210	14760	0.180	2118	0.030***	0.009
	Remittances & others	0.062	12708	0.063	1805	-0.001	0.006	0.079	14760	0.040	2118	0.039***	0.005
Other sources of income													
	HH enterprises	0.764	12738	0.817	1805	-0.052***	0.010	0.742	14779	0.813	2118	-0.071***	0.009
	Property & investments	0.049	12738	0.033	1805	0.016***	0.005	0.045	14779	0.016	2118	0.029***	0.003
	Transfers & other benefits	0.187	12738	0.151	1805	0.036***	0.009	0.213	14779	0.171	2118	0.042***	0.009
Income received in cash		1001406.66	12738	755617.68	1805	245788.98***	55264.39	1462539.37	14716	827723.97	2094	634815.40***	58819.71
Income received in kind		117858.05	12738	139507.10	1805	-21649.05**	10815.08	198902.89	14640	259817.51	2085	-60914.61***	11997.49
Av. monthly revenue from non-ag. activities		532430.61	6859	276228.80	1014	256201.81***	61756.55	914609.66	6080	541996.37	909	372613.29***	62027.61
Av. monthly employees in non-ag. activities		0.619	6826	0.303	996	0.316***	0.058	43.095	6102	0.774	909	42.320***	11.806

*Two sample t-test with unequal variances between refugee hosting and non-hosting districts. Significance level: *** p<0.01, ** p<0.05, * p<0.1*

Table A6: Comparing household and HH head indicators in the short panel (2009-2012) dataset between non-refugee hosting and refugee hosting districts (including Kampala)

	In the base wave=2009/10						*In the last wave=2012*					
	Mean (Non-hosting)	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**	**Mean (Non-hosting)**	**Obs.**	**Mean (Hosting)**	**Obs.**	**Mean Diff.**	**Std. Error**
HH welfare(consumption aggregate per adult equivalent)	56666.446	1835	82389.101	394	-25722.655***	3317.328	60848.386	2008	88149.285	430	-27300.899***	6505.562
Rural locations	0.823	2026	0.565	432	0.258***	0.021	0.835	2026	0.593	432	0.243***	0.021
HH size	6.239	2026	5.720	432	0.519***	0.167	6.239	2026	5.720	432	0.519***	0.167
Age of HH head	46.089	2023	44.456	432	1.633**	0.801	47.518	2025	46.134	432	1.384*	0.788
HH head male	0.720	2026	0.734	432	-0.014	0.024	0.687	2026	0.715	432	-0.029	0.024
HH head female	0.280	2026	0.266	432	0.014	0.024	0.313	2026	0.285	432	0.029	0.024
HH head education level												
No formal education	0.198	1908	0.141	404	0.057***	0.021	0.194	1979	0.155	420	0.039*	0.021
Didn't complete primary	0.429	1908	0.369	404	0.060**	0.027	0.411	1979	0.350	420	0.061**	0.026
Completed primary	0.266	1908	0.290	404	-0.023	0.024	0.280	1979	0.293	420	-0.012	0.024
Secondary and above	0.106	1908	0.200	404	-0.094***	0.018	0.114	1979	0.202	420	-0.088***	0.018
HH head marital status												
Married monogamously	0.559	2021	0.546	432	0.013	0.026	0.537	2025	0.549	432	-0.012	0.026
Married polygamously	0.185	2021	0.227	432	-0.042**	0.021	0.195	2025	0.236	432	-0.042*	0.021
Separated(divorced/widowed)	0.237	2021	0.199	432	0.038*	0.022	0.248	2025	0.190	432	0.059***	0.023
Never married	0.019	2021	0.028	432	-0.008	0.008	0.020	2025	0.025	432	-0.005	0.008
HH main source of income												
Subsistence farming	0.535	1946	0.436	399	0.099***	0.027	0.566	1856	0.437	382	0.129***	0.028
Commercial farming	0.028	1946	0.000	399	0.028***	0.008	0.012	1856	0.005	382	0.007	0.006
Wage employment	0.160	1946	0.211	399	-0.051**	0.021	0.129	1856	0.199	382	-0.070***	0.020
Non-agric self-employment	0.205	1946	0.248	399	-0.044*	0.022	0.213	1856	0.264	382	-0.052**	0.023
Remittances & Others	0.072	1946	0.105	399	-0.033**	0.015	0.080	1856	0.094	382	-0.014	0.015

Appendix 3: Full results for effects on welfare (OLS)

For tables A7 and A8, year and cluster fixed effects are included in regression (1) to (3). In Regression (4), household fixed effects replace the cluster fixed effects. All the other controls are included in regression (4), but the time invariant ones drop off. Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses. Significance level are: *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Detailed Effects of refugee presence on household welfare with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare(consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
Log of refugees (50km)	0.0235**	0.0236**	0.0273**	0.0217
	(0.0108)	(0.0108)	(0.0133)	(0.0144)
HH head age		0.0026	0.0119**	0.0000
		(0.0051)	(0.0056)	(0.0165)
Age squared		-0.0000	-0.0001	-0.0000
		(0.0000)	(0.0001)	(0.0001)
HH head sex (male)		0.0046	0.0244	-0.0778
		(0.0347)	(0.0377)	(0.0634)
Household size			-0.0262***	
			(0.0054)	
HH head marital status				
Married monogamously			-0.4265**	
			(0.1660)	
Married polygamously			-0.3720**	
			(0.1736)	
Separated (divorced/widowed)			-0.4128**	
			(0.1736)	
HH head education level				
Completed primary sch			0.2228***	
			(0.0372)	
HH main source of income				
Commercial farming			0.1069	
			(0.0896)	
Wage employment			-0.0003	
			(0.0486)	
Non-agricultural self-employment			0.0901**	
			(0.0420)	
Remittances & Others			-0.0092	
			(0.0966)	
Other source of HH income				
Property income and investments			0.2060**	
			(0.0846)	
Transfers and other benefits			0.1148***	
			(0.0418)	
HH Asset				
Own > median size of land (2.5 acres)			0.1999***	
			(0.0320)	
Observations	5,453	5,450	4,105	4,102
R-squared	0.3897	0.3899	0.3839	0.7172

Table A8: Effects of refugee presence on household welfare with analysis at cluster level and the distance weighted refugee index at 100km from the clusters (Panel 2009-2012)

	Log of welfare(consumption aggregate per adult equivalent)			
	(1)	(2)	(3)	(4)
Log of refugees (100km)	0.0018	0.0020	0.0170	0.0319**
	(0.0186)	(0.0185)	(0.0154)	(0.0147)
HH head age		0.0025	0.0119**	-0.0004
		(0.0051)	(0.0056)	(0.0166)
Age squared		-0.0000	-0.0001	-0.0000
		(0.0000)	(0.0001)	(0.0001)
HH head sex (male)		0.0044	0.0239	-0.0795
		(0.0348)	(0.0378)	(0.0634)
Household size			-0.0262***	
			(0.0054)	
HH head marital status				
Married monogamously			-0.4288**	
			(0.1652)	
Married polygamously			-0.3746**	
			(0.1728)	
Separated (divorced/widowed)			-0.4146**	
			(0.1729)	
HH head education level				
Completed primary sch			0.2227***	
			(0.0372)	
HH main source of income				
Commercial farming			0.1068	
			(0.0896)	
Wage employment			-0.0008	
			(0.0486)	
Non-agricultural self-employment			0.0907**	
			(0.0420)	
Remittances & Others			-0.0092	
			(0.0966)	
Other source of HH income				
Property income and investments			0.2063**	
			(0.0846)	
Transfers and other benefits			0.1153***	
			(0.0419)	
HH Asset				
Own > median size of land (2.5 acres)			0.2002***	
			(0.0321)	
Observations	5,453	5,450	4,105	4,102
R-squared	0.3893	0.3896	0.3833	0.7173

Appendix 4: Full results for effects on welfare (IV regression)

For tables A9 to A16, regressions (1) to (4) show results with the regressor (Log or refugees at 50km) predicted by the Log of distance IV generated using the mean border distance. For regressions (5) to (8), the IV is generated using the square of the mean border distance while for regressions (9) to (12), the square root of the mean border distance is used. These represent the decay categories of the IV. Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses. Significance level are: *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Second stage: Log Refugees at 50km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.03226	0.03207	0.07808*	0.07384*								
	(0.04466)	(0.04459)	(0.04453)	(0.04302)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.03786	0.03803	0.09245*	0.08947*				
					(0.04543)	(0.04539)	(0.04785)	(0.04609)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.04197	0.04149	0.07805	0.07528
									(0.04920)	(0.04909)	(0.04800)	(0.04687)
HH head age		0.00261	0.01187**	-0.00029		0.00262	0.01185**	-0.00038		0.00263	0.01187**	-0.00029
		(0.00510)	(0.00558)	(0.01656)		(0.00510)	(0.00558)	(0.01659)		(0.00510)	(0.00558)	(0.01656)
Age squared		-0.00003	-0.00008	-0.00000		-0.00003	-0.00008	-0.00000		-0.00003	-0.00008	-0.00000
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00470	0.02499	-0.07482		0.00476	0.02514	-0.07393		0.00479	0.02499	-0.07474
		(0.03461)	(0.03745)	(0.06348)		(0.03461)	(0.03745)	(0.06350)		(0.03461)	(0.03744)	(0.06354)
Household size			-0.02626***				-0.02627***				-0.02626***	
			(0.00539)				(0.00539)				(0.00539)	
Married monogamously			-0.42111**				-0.41959**				-0.42112**	
			(0.16636)				(0.16682)				(0.16627)	
Married polygamously			-0.36601**				-0.36431**				-0.36601**	
			(0.17389)				(0.17435)				(0.17381)	

Separated (divorced/widowed)			-0.40895**				-0.40785**				-0.40895**	
			(0.17400)				(0.17446)				(0.17393)	
Completed primary sch			0.22302***				0.22309***				0.22302***	
			(0.03706)				(0.03705)				(0.03707)	
Commercial farming			0.10660				0.10651				0.10660	
			(0.08928)				(0.08930)				(0.08928)	
Wage employment			0.00047				0.00070				0.00047	
			(0.04814)				(0.04810)				(0.04817)	
Non-agricultural self-employment			0.08930**				0.08907**				0.08930**	
			(0.04196)				(0.04199)				(0.04197)	
Remittances & Others			-0.00915				-0.00913				-0.00915	
			(0.09602)				(0.09599)				(0.09602)	
Property income and investments			0.20572**				0.20565**				0.20572**	
			(0.08426)				(0.08428)				(0.08426)	
Transfers and other benefits			0.11393***				0.11370***				0.11394***	
			(0.04160)				(0.04157)				(0.04164)	
Own > median size of land (2.5 acres)			0.19935***				0.19919***				0.19935***	
			(0.03180)				(0.03180)				(0.03181)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Kleibergen-Paap rk Wald F	19.34	19.33	14.62	14.15	18.04	18.03	13.58	13.17	16.43	16.42	12.99	12.61
Root MSE	0.593	0.593	0.533	0.362	0.593	0.593	0.533	0.363	0.593	0.593	0.533	0.362
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A10: First stage: Log Refugees at 50km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance)

	Log of Refugees (50km)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean boarder distance)	9.24792***	9.24997***	8.71514***	8.68000***								
	(2.10281)	(2.10376)	(2.27960)	(2.30744)								
Log of Distance IV (square of mean border distance)					5.85976***	5.86074***	5.57445***	5.58123***				
					(1.37952)	(1.38019)	(1.51271)	(1.53770)				
Log of Distance IV (square-root of mean border distance)									15.01496***	15.02006***	14.16263***	14.08865***
									(3.70476)	(3.70665)	(3.92898)	(3.96684)
HH head age		-0.00264	-0.00001	-0.00347		-0.00221	0.00062	-0.00114		-0.00291	-0.00033	-0.00403
		(0.00363)	(0.00323)	(0.01550)		(0.00363)	(0.00323)	(0.01584)		(0.00369)	(0.00330)	(0.01589)
Age squared		0.00003	-0.00000	0.00002		0.00002	-0.00001	-0.00002		0.00003	0.00000	0.00003
		(0.00003)	(0.00003)	(0.00016)		(0.00003)	(0.00003)	(0.00017)		(0.00003)	(0.00003)	(0.00017)
HH head sex (male)		-0.00493	-0.00571	0.00350		-0.00431	-0.00663	0.01889		-0.00574	-0.00520	-0.01100
		(0.01102)	(0.01611)	(0.08026)		(0.01107)	(0.01623)	(0.07668)		(0.01129)	(0.01669)	(0.08532)
Household size			0.00070				0.00058				0.00083	
			(0.00160)				(0.00154)				(0.00168)	
Married monogamously			-0.10517				-0.10349				-0.10746	
			(0.07852)				(0.08116)				(0.07647)	
Married polygamously			-0.11545				-0.11462				-0.11665	
			(0.07481)				(0.07740)				(0.07256)	
Separated (divorced/widowed)			-0.07393				-0.07242				-0.07481	
			(0.07726)				(0.07983)				(0.07513)	
Completed primary sch			0.00050				-0.00205				0.00139	
			(0.01293)				(0.01303)				(0.01301)	
Commercial farming			0.00052				-0.00378				0.00410	
			(0.00885)				(0.01001)				(0.00845)	
Wage employment			-0.01362				-0.01414				-0.01457	
			(0.02168)				(0.02209)				(0.02199)	
Non-agricultural self-employment			0.00461				0.00545				0.00478	

			(0.01590)				(0.01618)				(0.01591)	
Remittances & Others			0.00852				0.01148				0.00558	
			(0.01517)				(0.01565)				(0.01481)	
Property income and investments			0.00629				0.00776				0.00524	
			(0.01397)				(0.01421)				(0.01389)	
Transfers and other benefits			0.01516				0.01220				0.01763	
			(0.01488)				(0.01524)				(0.01499)	
Own > median size of land (2.5 acres)			0.01491				0.01672				0.01204	
			(0.01410)				(0.01452)				(0.01413)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Root MSE	0.581	0.582	0.612	0.593	0.585	0.586	0.615	0.597	0.589	0.589	0.619	0.600
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A11: Second stage: Log Refugees at 100km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.05464	0.05431	0.12505*	0.11830*								
	(0.07485)	(0.07471)	(0.07173)	(0.06503)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.06371	0.06398	0.14884*	0.14469**				
					(0.07608)	(0.07598)	(0.07755)	(0.07078)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.06550	0.06475	0.11356	0.10918*
									(0.07593)	(0.07577)	(0.07155)	(0.06513)
HH head age		0.00244	0.01173**	-0.00202		0.00242	0.01168**	-0.00251		0.00242	0.01175**	-0.00185
		(0.00511)	(0.00563)	(0.01666)		(0.00511)	(0.00563)	(0.01671)		(0.00512)	(0.00562)	(0.01664)
Age squared		-0.00003	-0.00008	0.00001		-0.00003	-0.00008	0.00001		-0.00003	-0.00008	0.00000
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00407	0.02267	-0.08058		0.00401	0.02239	-0.08093		0.00401	0.02281	-0.08047
		(0.03472)	(0.03776)	(0.06331)		(0.03471)	(0.03777)	(0.06346)		(0.03471)	(0.03775)	(0.06327)
Household size			-0.02625***				-0.02626***				-0.02625***	
			(0.00539)				(0.00539)				(0.00539)	
Married monogamously			-0.42458***				-0.42366**				-0.42502***	
			(0.16461)				(0.16471)				(0.16454)	
Married polygamously			-0.37064**				-0.36977**				-0.37107**	
			(0.17213)				(0.17222)				(0.17208)	
Separated (divorced/widowed)			-0.41299**				-0.41264**				-0.41317**	
			(0.17258)				(0.17272)				(0.17251)	
Completed primary sch			0.22308***				0.22317***				0.22304***	
			(0.03704)				(0.03702)				(0.03705)	
Commercial farming			0.10497				0.10456				0.10516	
			(0.08958)				(0.08966)				(0.08952)	
Wage employment			-0.00101				-0.00106				-0.00098	
			(0.04835)				(0.04834)				(0.04835)	

Non-agricultural self-employment			0.09133**				0.09147**				0.09126**	
			(0.04177)				(0.04177)				(0.04176)	
Remittances & Others			-0.00897				-0.00891				-0.00899	
			(0.09640)				(0.09645)				(0.09638)	
Property income and investments			0.20760**				0.20789**				0.20747**	
			(0.08436)				(0.08439)				(0.08435)	
Transfers and other benefits			0.11600***				0.11615***				0.11593***	
			(0.04167)				(0.04169)				(0.04164)	
Own > median size of land (2.5 acres)			0.19984***				0.19977***				0.19987***	
			(0.03191)				(0.03192)				(0.03191)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Kleibergen-Paap rk Wald F	17.39	17.39	13.58	12.70	20.40	20.40	15.57	14.46	14.46	14.47	11.71	11.04
Root MSE	0.594	0.594	0.534	0.362	0.594	0.594	0.536	0.364	0.594	0.594	0.534	0.362
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A12: First stage: Log Refugees at 100km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance)

	Log of Refugees (100km)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean border distance)	5.45956***	5.46255***	5.44191***	5.41772***								
	(1.30920)	(1.30982)	(1.47648)	(1.52001)								
Log of Distance IV (square of mean border distance)					3.48184***	3.48374***	3.46234***	3.45131***				
					(0.77086)	(0.77132)	(0.87745)	(0.90773)				
Log of Distance IV (square-root of mean border distance)									9.62042***	9.62596***	9.73377***	9.71382***
									(2.52952)	(2.53040)	(2.84457)	(2.92326)
HH head age		0.00151	0.00110	0.01251		0.00176	0.00150	0.01401		0.00131	0.00080	0.01151
		(0.00185)	(0.00196)	(0.01344)		(0.00185)	(0.00199)	(0.01359)		(0.00186)	(0.00194)	(0.01343)
Age squared		-0.00001	-0.00001	-0.00008		-0.00001	-0.00001	-0.00010		-0.00000	-0.00000	-0.00006
		(0.00002)	(0.00002)	(0.00012)		(0.00002)	(0.00002)	(0.00012)		(0.00002)	(0.00002)	(0.00012)
HH head sex (male)		0.00875	0.01494	0.05091		0.00914	0.01435	0.06007		0.00847	0.01562	0.04487
		(0.00653)	(0.01204)	(0.06553)		(0.00644)	(0.01152)	(0.06408)		(0.00678)	(0.01296)	(0.06955)
Household size			0.00037				0.00030				0.00046	
			(0.00101)				(0.00099)				(0.00104)	
Married monogamously			-0.03797*				-0.03693*				-0.03947**	
			(0.01928)				(0.02119)				(0.01793)	
Married polygamously			-0.03500*				-0.03450				-0.03566*	
			(0.02029)				(0.02196)				(0.01911)	
Separated (divorced/widowed)			-0.01379				-0.01286				-0.01427	
			(0.01832)				(0.02027)				(0.01695)	
Completed primary sch			-0.00020				-0.00179				0.00075	
			(0.01021)				(0.01017)				(0.01026)	
Commercial farming			0.01342				0.01077				0.01549	
			(0.01537)				(0.01504)				(0.01585)	
Wage employment			0.00335				0.00302				0.00282	
			(0.00954)				(0.00940)				(0.00985)	
Non-agricultural self-employment			-0.01334**				-0.01278*				-0.01397**	

			(0.00646)				(0.00652)				(0.00658)	
Remittances & Others			0.00383				0.00563				0.00245	
			(0.01204)				(0.01252)				(0.01158)	
Property income and investments			-0.01115				-0.01024				-0.01178	
			(0.00937)				(0.00930)				(0.00956)	
Transfers and other benefits			-0.00709				-0.00892				-0.00548	
			(0.00868)				(0.00873)				(0.00880)	
Own > median size of land (2.5 acres)			0.00541				0.00652				0.00369	
			(0.00663)				(0.00674)				(0.00654)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Root MSE	0.434	0.434	0.447	0.435	0.436	0.436	0.449	0.437	0.434	0.434	0.446	0.433
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A13: Second stage: Log Refugees at 50km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance) including Kampala district

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.02737	0.02721	0.07789*	0.07376*								
	(0.04452)	(0.04446)	(0.04452)	(0.04303)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.02927	0.02942	0.09207*	0.08941*				
					(0.04502)	(0.04500)	(0.04779)	(0.04608)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.03923	0.03882	0.07803	0.07521
									(0.04945)	(0.04936)	(0.04803)	(0.04690)
HH head age		0.00210	0.01184**	-0.00013		0.00211	0.01182**	-0.00023		0.00212	0.01184**	-0.00014
		(0.00486)	(0.00558)	(0.01654)		(0.00486)	(0.00558)	(0.01657)		(0.00486)	(0.00558)	(0.01654)
Age squared		-0.00003	-0.00008	-0.00001		-0.00003	-0.00008	-0.00001		-0.00003	-0.00008	-0.00001
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00695	0.02475	-0.07368		0.00697	0.02490	-0.07279		0.00705	0.02475	-0.07360
		(0.03276)	(0.03745)	(0.06350)		(0.03276)	(0.03745)	(0.06351)		(0.03275)	(0.03744)	(0.06355)
Household size			-0.02636***				-0.02637***				-0.02636***	
			(0.00540)				(0.00540)				(0.00540)	
Married monogamously			-0.42106**				-0.41955**				-0.42105**	
			(0.16637)				(0.16682)				(0.16628)	
Married polygamously			-0.36657**				-0.36490**				-0.36656**	
			(0.17392)				(0.17436)				(0.17384)	
Separated (divorced/widowed)			-0.41133**				-0.41025**				-0.41132**	
			(0.17406)				(0.17451)				(0.17400)	
Completed primary sch			0.22163***				0.22170***				0.22163***	
			(0.03702)				(0.03701)				(0.03703)	
Commercial farming			0.10797				0.10788				0.10797	
			(0.08938)				(0.08940)				(0.08937)	
Wage employment			0.00030				0.00052				0.00030	

			(0.04813)				(0.04809)				(0.04816)	
Non-agricultural self-employment			0.09238**				0.09215**				0.09237**	
			(0.04205)				(0.04208)				(0.04206)	
Remittances & Others			-0.00285				-0.00283				-0.00285	
			(0.09538)				(0.09535)				(0.09538)	
Property income and investments			0.19983**				0.19978**				0.19983**	
			(0.08358)				(0.08360)				(0.08358)	
Transfers and other benefits			0.11145***				0.11121***				0.11145***	
			(0.04162)				(0.04159)				(0.04167)	
Own > median size of land (2.5 acres)			0.19955***				0.19939***				0.19954***	
			(0.03182)				(0.03181)				(0.03182)	
Observations	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125
Kleibergen-Paap rk Wald F	19.58	19.57	14.62	14.16	18.71	18.69	13.60	13.19	16.22	16.21	12.99	12.61
Root MSE	0.591	0.591	0.533	0.362	0.591	0.591	0.534	0.363	0.591	0.591	0.533	0.362
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A14: First stage: Log Refugees at 50km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance) including Kampala district

	Log of Refugees (50km)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean border distance)	9.26140***	9.26348***	8.71557***	8.68045***								
	(2.09321)	(2.09414)	(2.27924)	(2.30710)								
Log of Distance IV (square of mean border distance)					5.87456***	5.87569***	5.57536***	5.58210***				
					(1.35830)	(1.35895)	(1.51200)	(1.53702)				
Log of Distance IV (square-root of mean border distance)									14.96346***	14.96821***	14.16041***	14.08663***
									(3.71555)	(3.71741)	(3.92914)	(3.96700)
HH head age		-0.00257	0.00001	-0.00332		-0.00223	0.00064	-0.00103		-0.00277	-0.00031	-0.00385
		(0.00339)	(0.00323)	(0.01549)		(0.00339)	(0.00323)	(0.01583)		(0.00345)	(0.00329)	(0.01587)
Age squared		0.00003	-0.00000	0.00002		0.00002	-0.00001	-0.00002		0.00003	0.00000	0.00003
		(0.00003)	(0.00003)	(0.00016)		(0.00003)	(0.00003)	(0.00017)		(0.00003)	(0.00003)	(0.00017)
HH head sex (male)		-0.00417	-0.00603	0.00406		-0.00380	-0.00691	0.01942		-0.00472	-0.00555	-0.01043
		(0.01016)	(0.01610)	(0.08027)		(0.01018)	(0.01622)	(0.07669)		(0.01044)	(0.01668)	(0.08533)
Household size			0.00072				0.00060				0.00086	
			(0.00160)				(0.00154)				(0.00168)	
Married monogamously			-0.10538				-0.10367				-0.10768	
			(0.07847)				(0.08111)				(0.07642)	
Married polygamously			-0.11569				-0.11483				-0.11690	
			(0.07476)				(0.07735)				(0.07251)	
Separated (divorced/widowed)			-0.07415				-0.07261				-0.07503	
			(0.07720)				(0.07977)				(0.07507)	
Completed primary sch			0.00035				-0.00218				0.00123	
			(0.01291)				(0.01301)				(0.01300)	
Commercial farming			0.00045				-0.00383				0.00402	
			(0.00887)				(0.01003)				(0.00848)	
Wage employment			-0.01408				-0.01454				-0.01507	
			(0.02163)				(0.02203)				(0.02194)	
Non-agricultural self-employment			0.00413				0.00503				0.00425	

			(0.01590)				(0.01617)				(0.01590)	
Remittances & Others			0.00920				0.01209				0.00628	
			(0.01513)				(0.01560)				(0.01478)	
Property income and investments			0.00520				0.00679				0.00408	
			(0.01385)				(0.01409)				(0.01377)	
Transfers and other benefits			0.01537				0.01238				0.01786	
			(0.01484)				(0.01519)				(0.01495)	
Own > median size of land (2.5 acres)			0.01488				0.01669				0.01200	
			(0.01410)				(0.01453)				(0.01413)	
Observations	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125
Root MSE	0.563	0.563	0.611	0.593	0.567	0.567	0.614	0.596	0.571	0.571	0.618	0.599
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A15: Second stage: Log Refugees at 100km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance) including Kampala district

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.04644	0.04615	0.12475*	0.11818*								
	(0.07479)	(0.07469)	(0.07169)	(0.06507)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.04941	0.04965	0.14825*	0.14460**				
					(0.07568)	(0.07562)	(0.07744)	(0.07080)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.06123	0.06058	0.11354	0.10909*
									(0.07631)	(0.07618)	(0.07158)	(0.06519)
HH head age		0.00197	0.01170**	-0.00187		0.00197	0.01165**	-0.00236		0.00195	0.01172**	-0.00170
		(0.00487)	(0.00563)	(0.01664)		(0.00487)	(0.00564)	(0.01669)		(0.00487)	(0.00562)	(0.01662)
Age squared		-0.00002	-0.00008	0.00000		-0.00002	-0.00008	0.00001		-0.00002	-0.00008	0.00000
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00649	0.02245	-0.07945		0.00647	0.02218	-0.07980		0.00641	0.02258	-0.07932
		(0.03284)	(0.03776)	(0.06333)		(0.03284)	(0.03777)	(0.06348)		(0.03284)	(0.03775)	(0.06328)
Household size			-0.02635***				-0.02636***				-0.02634***	
			(0.00540)				(0.00540)				(0.00540)	
Married monogamously			-0.42451***				-0.42360**				-0.42495***	
			(0.16463)				(0.16473)				(0.16456)	
Married polygamously			-0.37119**				-0.37032**				-0.37160**	
			(0.17217)				(0.17226)				(0.17212)	
Separated (divorced/widowed)			-0.41535**				-0.41499**				-0.41552**	
			(0.17266)				(0.17280)				(0.17259)	
Completed primary sch			0.22170***				0.22178***				0.22166***	
			(0.03701)				(0.03699)				(0.03702)	
Commercial farming			0.10633				0.10593				0.10653	
			(0.08967)				(0.08975)				(0.08961)	
Wage employment			-0.00117				-0.00121				-0.00115	
			(0.04833)				(0.04833)				(0.04834)	

Non-agricultural self-employment			0.09440**				0.09455**				0.09433**	
			(0.04186)				(0.04185)				(0.04185)	
Remittances & Others			-0.00271				-0.00267				-0.00273	
			(0.09576)				(0.09580)				(0.09574)	
Property income and investments			0.20178**				0.20208**				0.20163**	
			(0.08368)				(0.08371)				(0.08367)	
Transfers and other benefits			0.11352***				0.11366***				0.11345***	
			(0.04169)				(0.04171)				(0.04166)	
Own > median size of land (2.5 acres)			0.20003***				0.19996***				0.20006***	
			(0.03193)				(0.03193)				(0.03193)	
Observations	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125
Kleibergen-Paap rk Wald F	17.77	17.77	13.59	12.71	21.52	21.51	15.60	14.48	14.43	14.44	11.71	11.04
Root MSE	0.591	0.591	0.535	0.362	0.591	0.591	0.536	0.364	0.591	0.591	0.534	0.362
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A16: First stage: Log Refugees at 100km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance) including Kampala district

	Log of Refugees (100km)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean border distance)	5.45962***	5.46204***	5.44187***	5.41763***								
	(1.29524)	(1.29575)	(1.47595)	(1.51948)								
Log of Distance IV (square of mean border distance)					3.48017***	3.48165***	3.46261***	3.45146***				
					(0.75025)	(0.75062)	(0.87676)	(0.90701)				
Log of Distance IV (square-root of mean border distance)									9.58775***	9.59222***	9.73207***	9.71222***
									(2.52359)	(2.52434)	(2.84412)	(2.92283)
HH head age		0.00127	0.00112	0.01260		0.00148	0.00152	0.01407		0.00111	0.00082	0.01162
		(0.00174)	(0.00196)	(0.01342)		(0.00173)	(0.00199)	(0.01357)		(0.00175)	(0.00194)	(0.01342)
Age squared		-0.00000	-0.00001	-0.00008		-0.00001	-0.00001	-0.00010		-0.00000	-0.00000	-0.00006
		(0.00002)	(0.00002)	(0.00012)		(0.00002)	(0.00002)	(0.00012)		(0.00002)	(0.00002)	(0.00012)
HH head sex (male)		0.00762	0.01463	0.05132		0.00785	0.01407	0.06046		0.00748	0.01528	0.04529
		(0.00601)	(0.01202)	(0.06551)		(0.00588)	(0.01151)	(0.06405)		(0.00628)	(0.01293)	(0.06955)
Household size			0.00040				0.00032				0.00049	
			(0.00101)				(0.00099)				(0.00104)	
Married monogamously			-0.03815**				-0.03710*				-0.03966**	
			(0.01921)				(0.02113)				(0.01786)	
Married polygamously			-0.03523*				-0.03471				-0.03589*	
			(0.02024)				(0.02191)				(0.01907)	
Separated (divorced/widowed)			-0.01405				-0.01311				-0.01454	
			(0.01824)				(0.02019)				(0.01686)	
Completed primary sch			-0.00036				-0.00195				0.00059	
			(0.01019)				(0.01016)				(0.01025)	
Commercial farming			0.01338				0.01075				0.01545	
			(0.01538)				(0.01504)				(0.01585)	
Wage employment			0.00293				0.00264				0.00238	
			(0.00953)				(0.00939)				(0.00985)	
Non-agricultural self-employment			-0.01368**				-0.01308**				-0.01434**	

			(0.00643)				(0.00650)				(0.00656)	
Remittances & Others			0.00463				0.00639				0.00328	
			(0.01206)				(0.01252)				(0.01161)	
Property income and investments			-0.01232				-0.01134				-0.01301	
			(0.00935)				(0.00928)				(0.00954)	
Transfers and other benefits			-0.00699				-0.00884				-0.00536	
			(0.00867)				(0.00872)				(0.00879)	
Own > median size of land (2.5 acres)			0.00539				0.00650				0.00367	
			(0.00663)				(0.00674)				(0.00654)	
Observations	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125	5,896	5,893	4,128	4,125
Root MSE	0.420	0.420	0.446	0.434	0.422	0.422	0.448	0.436	0.420	0.420	0.445	0.433
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

For tables A17 to A20, in all regressions, the IV is generated using the mean border distance. Regressions (1) to (4) show results with the regressor (Log of refugees at 50km) constructed using distance to closest cluster. For regressions (5) to (8), the refugee index is generated using the square of the distance while for regressions (9) to (12), the square root of the distance to closest cluster is used. These represent the decay categories of the refugee index. Year and cluster fixed effects are included in regressions (1) to (3), (5) to (7) & (9) to (11). For each of the 3 decay categories of the regressor (i.e. the refugee index), the first regression is without other controls; the second regression has age, agesq & sex(male==1) controlled for; and the third regression has the more endogenous controls added (i.e. HH size, initial marital status, education, occupation, other HH income sources & ownership of land). In Regressions (4), (8) & (12), household fixed effects replace the cluster fixed effects and all the other controls are included, but the time invariant ones drop off (only age, agesq & male remain). Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses. Significance level is: *** p<0.01, ** p<0.05, * p<0.1.

Table A17: Second stage: Log Refugees at 50km with decay function (i.e. index generated using 1)distance to closest cluster, 2)square of distance to closest cluster and 3) square root of distance to closest cluster) instrumented by distance-based IV.

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (50km) (with distance)	0.03226	0.03207	0.07808*	0.07384*								
	(0.04466)	(0.04459)	(0.04453)	(0.04302)								
Log of refugees (50km) (with sq distance)					0.08294	0.08246	0.19062*	0.18028*				
					(0.11182)	(0.11163)	(0.10133)	(0.09788)				
Log of refugees (50km) (with sqrt distance)									0.02395	0.02381	0.05854*	0.05534*
									(0.03335)	(0.03330)	(0.03403)	(0.03286)
HH head age		0.00261	0.01187**	-0.00029		0.00264	0.01193**	-0.00068		0.00260	0.01188**	-0.00012
		(0.00510)	(0.00558)	(0.01656)		(0.00511)	(0.00558)	(0.01663)		(0.00510)	(0.00558)	(0.01654)
Age squared		-0.00003	-0.00008	-0.00000		-0.00003	-0.00008	-0.00000		-0.00003	-0.00008	-0.00001
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00470	0.02499	-0.07482		0.00489	0.02578	-0.06926		0.00466	0.02483	-0.07556
		(0.03461)	(0.03745)	(0.06348)		(0.03457)	(0.03751)	(0.06376)		(0.03462)	(0.03744)	(0.06347)
Household size			-0.02626***				-0.02642***				-0.02623***	
			(0.00539)				(0.00539)				(0.00539)	
Married monogamously			-0.42111**				-0.41838**				-0.42183**	
			(0.16636)				(0.16609)				(0.16638)	
Married polygamously			-0.36601**				-0.36215**				-0.36699**	

			(0.17389)				(0.17352)				(0.17393)	
Separated (divorced/widowed)			-0.40895**				-0.40553**				-0.40978**	
			(0.17400)				(0.17373)				(0.17402)	
Completed primary sch			0.22302***				0.22344***				0.22288***	
			(0.03706)				(0.03707)				(0.03705)	
Commercial farming			0.10660				0.10629				0.10668	
			(0.08928)				(0.08929)				(0.08928)	
Wage employment			0.00047				0.00012				0.00057	
			(0.04814)				(0.04808)				(0.04817)	
Non-agricultural self-employment			0.08930**				0.08969**				0.08921**	
			(0.04196)				(0.04192)				(0.04197)	
Remittances & Others			-0.00915				-0.00894				-0.00919	
			(0.09602)				(0.09600)				(0.09603)	
Property income and investments			0.20572**				0.20715**				0.20548**	
			(0.08426)				(0.08411)				(0.08429)	
Transfers and other benefits			0.11393***				0.11395***				0.11395***	
			(0.04160)				(0.04164)				(0.04159)	
Own > median size of land (2.5 acres)			0.19935***				0.19887***				0.19950***	
			(0.03180)				(0.03185)				(0.03180)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Kleibergen-Paap rk Wald F	19.34	19.33	14.62	14.15	18.55	18.55	13.99	13.68	18.29	18.28	13.89	13.42
Root MSE	0.593	0.593	0.533	0.362	0.593	0.593	0.533	0.362	0.593	0.593	0.533	0.362
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A18: First stage: Log Refugees at 50km with decay function (i.e. index generated using 1)distance to closest cluster, 2)square of distance to closest cluster and 3) square root of distance to closest cluster) instrumented by distance-based IV.

	Log of refugees (50km) (with distance)				Log of refugees (50km) (with sq distance)				Log of refugees (50km) (with sqrt distance)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean border distance)	9.24792***	9.24997***	8.71514***	8.68000***	3.59668***	3.59728***	3.56997***	3.55512***	12.45550***	12.45850***	11.62387***	11.58091***
	(2.10281)	(2.10376)	(2.27960)	(2.30744)	(0.83500)	(0.83525)	(0.95432)	(0.96117)	(2.91265)	(2.91397)	(3.11908)	(3.16094)
HH head age		-0.00264	-0.00001	-0.00347		-0.00147	-0.00032	0.00075		-0.00340	-0.00019	-0.00760
		(0.00363)	(0.00323)	(0.01550)		(0.00222)	(0.00177)	(0.00760)		(0.00432)	(0.00390)	(0.01984)
Age squared		0.00003	-0.00000	0.00002		0.00001	0.00000	-0.00002		0.00003	-0.00000	0.00006
		(0.00003)	(0.00003)	(0.00016)		(0.00002)	(0.00002)	(0.00008)		(0.00004)	(0.00004)	(0.00021)
HH head sex (male)		-0.00493	-0.00571	0.00350		-0.00427	-0.00648	-0.02940		-0.00492	-0.00487	0.01811
		(0.01102)	(0.01611)	(0.08026)		(0.00556)	(0.00881)	(0.04476)		(0.01426)	(0.02032)	(0.10108)
Household size			0.00070				0.00113				0.00043	
			(0.00160)				(0.00105)				(0.00193)	
Married monogamously			-0.10517				-0.05740				-0.12797	
			(0.07852)				(0.03487)				(0.10126)	
Married polygamously			-0.11545				-0.06754**				-0.13711	
			(0.07481)				(0.03337)				(0.09640)	
Separated (divorced/widowed)			-0.07393				-0.04820				-0.08434	
			(0.07726)				(0.03461)				(0.09953)	
Completed primary sch			0.00050				-0.00200				0.00298	
			(0.01293)				(0.00745)				(0.01557)	
Commercial farming			0.00052				0.00188				-0.00066	
			(0.00885)				(0.00470)				(0.01145)	
Wage employment			-0.01362				-0.00372				-0.01978	
			(0.02168)				(0.01155)				(0.02606)	
Non-agricultural self-employment			0.00461				-0.00012				0.00770	
			(0.01590)				(0.00821)				(0.01967)	
Remittances & Others			0.00852				0.00238				0.01199	
			(0.01517)				(0.00811)				(0.01913)	
Property income and investments			0.00629				-0.00493				0.01241	

			(0.01397)				(0.00894)				(0.01741)	
Transfers and other benefits			0.01516				0.00615				0.01993	
			(0.01488)				(0.00685)				(0.01924)	
Own > median size of land (2.5 acres)			0.01491				0.00863				0.01724	
			(0.01410)				(0.00742)				(0.01779)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Root MSE	0.581	0.582	0.612	0.593	0.297	0.297	0.315	0.305	0.744	0.745	0.779	0.756
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A19: Second stage: Log Refugees at 100km with decay function (i.e. index generated using 1)distance to closest cluster, 2)square of distance to closest cluster and 3) square root of distance to closest cluster) instrumented by distance-based IV.

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of refugees (100km) (with distance)	0.05464	0.05431	0.12505*	0.11830*								
	(0.07485)	(0.07471)	(0.07173)	(0.06503)								
Log of refugees (100km) (with sq distance)					0.07919	0.07872	0.17786**	0.16863**				
					(0.10636)	(0.10619)	(0.09069)	(0.08452)				
Log of refugees (100km) (with sqrt distance)									0.04762	0.04733	0.10911*	0.10304*
									(0.06577)	(0.06565)	(0.06608)	(0.05957)
HH head age		0.00244	0.01173**	-0.00202		0.00256	0.01198**	-0.00048		0.00240	0.01164**	-0.00267
		(0.00511)	(0.00563)	(0.01666)		(0.00511)	(0.00562)	(0.01663)		(0.00512)	(0.00563)	(0.01669)
Age squared		-0.00003	-0.00008	0.00001		-0.00003	-0.00009	-0.00001		-0.00003	-0.00008	0.00001
		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)		(0.00005)	(0.00005)	(0.00014)
HH head sex (male)		0.00407	0.02267	-0.08058		0.00444	0.02438	-0.07114		0.00398	0.02213	-0.08356
		(0.03472)	(0.03776)	(0.06331)		(0.03466)	(0.03763)	(0.06380)		(0.03473)	(0.03779)	(0.06331)
Household size			-0.02625***				-0.02637***				-0.02622***	
			(0.00539)				(0.00540)				(0.00539)	
Married monogamously			-0.42458***				-0.42368**				-0.42470***	
			(0.16461)				(0.16473)				(0.16443)	
Married polygamously			-0.37064**				-0.36922**				-0.37097**	
			(0.17213)				(0.17228)				(0.17196)	
Separated (divorced/widowed)			-0.41299**				-0.41070**				-0.41350**	
			(0.17258)				(0.17253)				(0.17245)	
Completed primary sch			0.22308***				0.22343***				0.22286***	
			(0.03704)				(0.03703)				(0.03702)	
Commercial farming			0.10497				0.10622				0.10509	
			(0.08958)				(0.08944)				(0.08955)	
Wage employment			-0.00101				-0.00059				-0.00098	
			(0.04835)				(0.04831)				(0.04833)	
Non-agricultural self-employment			0.09133**				0.09126**				0.09127**	

			(0.04177)				(0.04177)				(0.04178)	
Remittances & Others			-0.00897				-0.00848				-0.00915	
			(0.09640)				(0.09639)				(0.09639)	
Property income and investments			0.20760**				0.20791**				0.20749**	
			(0.08436)				(0.08426)				(0.08435)	
Transfers and other benefits			0.11600***				0.11506***				0.11623***	
			(0.04167)				(0.04166)				(0.04167)	
Own > median size of land (2.5 acres)			0.19984***				0.19983***				0.19968***	
			(0.03191)				(0.03188)				(0.03192)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Kleibergen-Paap rk Wald F	17.39	17.39	13.58	12.70	38.09	38.10	31.02	29.36	12.63	12.63	9.736	9.148
Root MSE	0.594	0.594	0.534	0.362	0.593	0.593	0.532	0.360	0.594	0.594	0.536	0.363
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A20: First stage: Log Refugees at 100km instrumented by distance-based IV with decay function represented (i.e. IV generated using 1)mean border distance, 2)square of mean border distance and 3) square root of mean border distance)

	Log of refugees (100km) (with distance)				Log of refugees (100km) (with sq distance)				Log of refugees (100km) (with sqrt distance)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Log of Distance IV (mean border distance)	5.45956***	5.46255***	5.44191***	5.41772***	3.76700***	3.76859***	3.82615***	3.80079***	6.26401***	6.26762***	6.23711***	6.22039***
	(1.30920)	(1.30982)	(1.47648)	(1.52001)	(0.61038)	(0.61057)	(0.68696)	(0.70140)	(1.76259)	(1.76349)	(1.99892)	(2.05657)
HH head age		0.00151	0.00110	0.01251		-0.00043	-0.00062	-0.00039		0.00251	0.00213	0.02061
		(0.00185)	(0.00196)	(0.01344)		(0.00129)	(0.00098)	(0.00613)		(0.00241)	(0.00260)	(0.01778)
Age squared		-0.00001	-0.00001	-0.00008		0.00001	0.00001	0.00002		-0.00001	-0.00001	-0.00014
		(0.00002)	(0.00002)	(0.00012)		(0.00001)	(0.00001)	(0.00006)		(0.00002)	(0.00002)	(0.00016)
HH head sex (male)		0.00875	0.01494	0.05091		0.00128	0.00093	-0.02027		0.01192	0.02207	0.08736
		(0.00653)	(0.01204)	(0.06553)		(0.00425)	(0.00740)	(0.04185)		(0.00798)	(0.01510)	(0.08069)
Household size			0.00037				0.00094				0.00014	
			(0.00101)				(0.00071)				(0.00124)	
Married monogamously			-0.03797*				-0.03172**				-0.04241*	
			(0.01928)				(0.01367)				(0.02389)	
Married polygamously			-0.03500*				-0.03264**				-0.03714	
			(0.02029)				(0.01334)				(0.02551)	
Separated (divorced/widowed)			-0.01379				-0.02259				-0.01116	
			(0.01832)				(0.01436)				(0.02149)	
Completed primary sch			-0.00020				-0.00210				0.00181	
			(0.01021)				(0.00491)				(0.01352)	
Commercial farming			0.01342				0.00236				0.01427	
			(0.01537)				(0.00798)				(0.01699)	
Wage employment			0.00335				0.00003				0.00360	
			(0.00954)				(0.00546)				(0.01208)	
Non-agricultural self-employment			-0.01334**				-0.00900*				-0.01470*	
			(0.00646)				(0.00491)				(0.00759)	
Remittances & Others			0.00383				-0.00006				0.00604	
			(0.01204)				(0.00729)				(0.01464)	
Property income and investments			-0.01115				-0.00958				-0.01172	

			(0.00937)				(0.00774)				(0.01031)	
Transfers and other benefits			-0.00709				0.00031				-0.01017	
			(0.00868)				(0.00464)				(0.01091)	
Own > median size of land (2.5 acres)			0.00541				0.00383				0.00762	
			(0.00663)				(0.00423)				(0.00847)	
Observations	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102	5,453	5,450	4,105	4,102
Root MSE	0.434	0.434	0.447	0.435	0.223	0.223	0.231	0.225	0.567	0.568	0.586	0.569
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Disaggregated effects: Comparing the decay function of the IV

For tables A21 to A28, regressions (1) to (4) show results with the regressor (Log or refugees at 50km) predicted by the Log of distance IV generated using the mean border distance. For regressions (5) to (8), the IV is generated using the square of the mean border distance while for regressions (9) to (12), the square root of the mean border distance is used. These represent the decay categories of the IV. Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses. Significance level is: *** p<0.01, ** p<0.05, * p<0.1.

Initial education level

Table A21: Second stage: Effects of refugee presence on household welfare disaggregated by initial education level, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A (Didn't complete primary education)											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.09736*	0.09596*	0.12497	0.11212								
	(0.05594)	(0.05540)	(0.07754)	(0.06946)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.10036*	0.09922*	0.14989*	0.13691*				
					(0.05612)	(0.05570)	(0.08256)	(0.07514)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.10672*	0.10509*	0.11914	0.10799
									(0.06146)	(0.06077)	(0.08002)	(0.07226)
Observations	3,224	3,224	2,616	2,614	3,224	3,224	2,616	2,614	3,224	3,224	2,616	2,614
Kleibergen-Paap rk Wald F	12.54	12.55	8.298	8.177	11.83	11.83	7.698	7.619	10.95	10.97	7.384	7.274
Root MSE	0.544	0.543	0.509	0.372	0.544	0.544	0.511	0.374	0.544	0.544	0.508	0.372
	Panel B (Completed primary education)											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.02190	0.01969	0.00903	0.03060								
	(0.04250)	(0.04211)	(0.04793)	(0.04568)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.02474	0.02117	0.00889	0.03215				
					(0.04613)	(0.04560)	(0.05252)	(0.04982)				

Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.02838	0.02706	0.01731	0.04242
									(0.04699)	(0.04663)	(0.05162)	(0.05057)
Observations	2,015	2,014	1,489	1,488	2,015	2,014	1,489	1,488	2,015	2,014	1,489	1,488
Kleibergen-Paap rk Wald F	14.45	14.45	12.47	12.24	13.78	13.76	11.84	11.61	12.69	12.68	11.35	11.16
Root MSE	0.546	0.540	0.476	0.340	0.546	0.540	0.476	0.340	0.546	0.540	0.476	0.341
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A22: Second stage: Effects of refugee presence on household welfare disaggregated by initial education level, with analysis at cluster level and the distance weighted refugee index at 100km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A (Didn't complete primary education)											
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.14933*	0.14708*	0.16349*	0.14838*								
	(0.07896)	(0.07846)	(0.08814)	(0.07872)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.15538*	0.15351*	0.19706**	0.18312**				
					(0.08211)	(0.08168)	(0.09611)	(0.08819)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.14797*	0.14563*	0.13935*	0.12718*
									(0.07970)	(0.07914)	(0.08333)	(0.07400)
Observations	3,224	3,224	2,616	2,614	3,224	3,224	2,616	2,614	3,224	3,224	2,616	2,614
Kleibergen-Paap rk Wald F	13.77	13.79	11.28	10.73	16.22	16.23	13.02	12.27	11.45	11.47	9.630	9.248
Root MSE	0.545	0.545	0.511	0.373	0.546	0.545	0.513	0.376	0.545	0.545	0.509	0.372
	Panel B (Completed primary education)											
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.04234	0.03804	0.01991	0.06518								
	(0.08489)	(0.08348)	(0.10615)	(0.09722)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.04782	0.04089	0.01971	0.06886				
					(0.09161)	(0.08982)	(0.11696)	(0.10638)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.05133	0.04891	0.03551	0.08399
									(0.08818)	(0.08696)	(0.10662)	(0.09970)
Observations	2,015	2,014	1,489	1,488	2,015	2,014	1,489	1,488	2,015	2,014	1,489	1,488
Kleibergen-Paap rk Wald F	13.68	13.66	12.56	11.88	15.60	15.57	14.27	13.44	11.48	11.46	10.70	10.17
Root MSE	0.546	0.541	0.476	0.340	0.546	0.541	0.476	0.340	0.546	0.541	0.476	0.341
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*

Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Initial occupation

Table A23: Second stage: Effects of refugee presence on household welfare disaggregated by initial occupation, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Panel A (Subsistence farming)						
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.08035	0.08138	0.09170*	0.08407*								
	(0.05125)	(0.05133)	(0.04793)	(0.04368)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.10494*	0.10637*	0.11187**	0.10529**				
					(0.05710)	(0.05725)	(0.05246)	(0.04852)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.07608	0.07634	0.08812*	0.07956*
									(0.05277)	(0.05265)	(0.04952)	(0.04472)
Observations	2,850	2,849	2,532	2,532	2,850	2,849	2,532	2,532	2,850	2,849	2,532	2,532
Kleibergen-Paap rk Wald F	14.35	14.34	14.20	13.85	12.74	12.73	12.57	12.30	12.83	12.82	12.80	12.51
Root MSE	0.533	0.530	0.513	0.366	0.534	0.531	0.515	0.368	0.533	0.530	0.513	0.366
						Panel B (Commercial farming)						
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.57362	0.45739	0.31604	0.21158								
	(0.91898)	(0.78486)	(0.71053)	(0.55641)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.68215	0.56572	0.39674	0.27947				
					(1.04714)	(0.91285)	(0.86387)	(0.69321)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.49286	0.39121	0.25172	0.15182
									(0.80360)	(0.69543)	(0.62405)	(0.49511)
Observations	148	148	133	133	148	148	133	133	148	148	133	133
Kleibergen-Paap rk Wald F	1.771	1.740	1.298	1.508	1.607	1.563	1.058	1.193	1.834	1.789	1.309	1.482
Root MSE	0.434	0.408	0.374	0.344	0.442	0.415	0.378	0.347	0.429	0.404	0.370	0.341
						Panel C (Wage employment)						
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.02290	0.02291	-0.02186	0.02644								

	(0.07035)	(0.07011)	(0.12617)	(0.11184)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					-0.00207	0.00068	-0.01460	0.03929				
					(0.08004)	(0.07903)	(0.13704)	(0.11993)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.04785	0.04642	-0.04025	0.00884
									(0.07721)	(0.07728)	(0.13570)	(0.12045)
Observations	843	842	533	533	843	842	533	533	843	842	533	533
Kleibergen-Paap rk Wald F	9.851	9.829	7.005	7.251	10.07	10.03	7.201	7.445	7.852	7.840	6.104	6.338
Root MSE	0.517	0.513	0.437	0.367	0.517	0.514	0.437	0.367	0.517	0.513	0.438	0.368
					Panel D (Non-agriculture self-employment)							
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.03556	0.03295	0.04755	0.04190								
	(0.08114)	(0.07635)	(0.14670)	(0.15579)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.01600	0.01666	0.00760	-0.00204				
					(0.07556)	(0.07132)	(0.13468)	(0.13978)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.08898	0.08291	0.17809	0.18533
									(0.11750)	(0.11115)	(0.20970)	(0.22979)
Observations	1,068	1,067	669	667	1,068	1,067	669	667	1,068	1,067	669	667
Kleibergen-Paap rk Wald F	8.789	8.719	4.676	4.530	8.380	8.323	5.320	5.117	6.527	6.468	3.440	3.363
Root MSE	0.515	0.511	0.414	0.327	0.515	0.511	0.413	0.325	0.517	0.513	0.426	0.345
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A24: Second stage: Effects of refugee presence on household welfare disaggregated by initial occupation, with analysis at cluster level and the distance weighted refugee index at 100km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Panel A (Subsistence farming)						
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.12465*	0.12617*	0.14639**	0.13621**								
	(0.06995)	(0.07035)	(0.07320)	(0.06243)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.16012**	0.16217**	0.17679**	0.16928**				
					(0.07739)	(0.07783)	(0.08000)	(0.06971)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.10722	0.10754	0.12783*	0.11700**
									(0.06740)	(0.06763)	(0.07094)	(0.05947)
Observations	2,850	2,849	2,532	2,532	2,850	2,849	2,532	2,532	2,850	2,849	2,532	2,532
Kleibergen-Paap rk Wald F	15.31	15.31	14.12	13.31	17.91	17.91	16.31	15.32	13.79	13.79	12.60	11.92
Root MSE	0.534	0.531	0.515	0.367	0.535	0.533	0.517	0.369	0.533	0.531	0.514	0.366
						Panel B (Commercial farming)						
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.94310	0.74418	0.55849	0.39234								
	(1.06472)	(0.90921)	(0.93491)	(0.82826)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.94215	0.76856	0.56876	0.41883				
					(1.04851)	(0.90004)	(0.93709)	(0.84295)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.78204	0.61503	0.42804	0.26943
									(0.90783)	(0.79301)	(0.81904)	(0.74543)
Observations	148	148	133	133	148	148	133	133	148	148	133	133
Kleibergen-Paap rk Wald F	12.41	12.45	10.38	10.11	11.83	11.78	9.910	9.771	13.02	12.80	10.15	9.607
Root MSE	0.432	0.406	0.373	0.345	0.432	0.407	0.373	0.346	0.426	0.401	0.369	0.342
						Panel C (Wage employment)						
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.05862	0.05894	-0.03598	0.04346								
	(0.18544)	(0.18623)	(0.20406)	(0.18940)								

Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					-0.00552	0.00183	-0.02647	0.07118				
					(0.21306)	(0.21176)	(0.24606)	(0.22566)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.11163	0.10884	-0.05718	0.01251
									(0.19594)	(0.19714)	(0.18766)	(0.17177)
Observations	843	842	533	533	843	842	533	533	843	842	533	533
Kleibergen-Paap rk Wald F	3.643	3.644	2.950	3.236	4.429	4.435	3.351	3.665	2.879	2.877	2.542	2.778
Root MSE	0.518	0.515	0.436	0.369	0.517	0.514	0.436	0.370	0.520	0.516	0.436	0.368
					Panel D (Non-agriculture self-employment)							
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.07325	0.06729	0.06509	0.05537								
	(0.17144)	(0.15792)	(0.19841)	(0.20269)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.03162	0.03276	0.01116	-0.00291				
					(0.15149)	(0.14153)	(0.19754)	(0.19972)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.17851	0.16383	0.21811	0.21722
									(0.24417)	(0.22284)	(0.25041)	(0.25831)
Observations	1,068	1,067	669	667	1,068	1,067	669	667	1,068	1,067	669	667
Kleibergen-Paap rk Wald F	8.734	9.144	5.631	5.810	10.47	10.90	6.610	6.685	6.193	6.563	4.166	4.406
Root MSE	0.517	0.513	0.414	0.325	0.516	0.512	0.413	0.325	0.523	0.517	0.421	0.333
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Initial land ownership

Table A25: Second stage: Effects of refugee presence on household welfare disaggregated by initial landownership, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A (Own <= median land size "2.5 acres")											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.07818	0.07681	0.08618	0.09122*								
	(0.05174)	(0.05145)	(0.05350)	(0.05023)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.10015*	0.09973*	0.10804*	0.11007**				
					(0.05656)	(0.05647)	(0.05942)	(0.05611)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.06218	0.05974	0.07027	0.07976
									(0.05683)	(0.05643)	(0.05660)	(0.05329)
Observations	2,124	2,124	1,981	1,980	2,124	2,124	1,981	1,980	2,124	2,124	1,981	1,980
Kleibergen-Paap rk Wald F	11.99	11.96	12.08	11.94	11.29	11.27	11.37	11.19	10.32	10.29	10.48	10.39
Root MSE	0.526	0.526	0.506	0.378	0.528	0.527	0.507	0.380	0.526	0.525	0.505	0.378
	Panel B (Own > median land size "2.5 acres")											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.01440	0.02057	0.02718	0.03440								
	(0.05408)	(0.05455)	(0.05567)	(0.05698)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.02504	0.03104	0.03487	0.04439				
					(0.05746)	(0.05758)	(0.05876)	(0.05870)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.02396	0.03090	0.04013	0.04849
									(0.05874)	(0.05963)	(0.06174)	(0.06387)
Observations	2,170	2,168	2,124	2,122	2,170	2,168	2,124	2,122	2,170	2,168	2,124	2,122
Kleibergen-Paap rk Wald F	13.41	13.38	13.09	13.08	12.09	12.07	12.09	12.10	12.29	12.26	12.01	12
Root MSE	0.508	0.505	0.493	0.340	0.508	0.506	0.493	0.341	0.508	0.506	0.493	0.341

Included controls

Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A26: Second stage: Effects of refugee presence on household welfare disaggregated by initial landownership, with analysis at cluster level and the distance weighted refugee index at 100km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A (Own <= median land size "2.5 acres")											
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.13256	0.13022	0.14257	0.15208								
	(0.09587)	(0.09547)	(0.09774)	(0.09341)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.17510*	0.17440*	0.18535*	0.19085*				
					(0.10472)	(0.10458)	(0.10859)	(0.10427)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.09602	0.09220	0.10512	0.11992
									(0.09552)	(0.09489)	(0.09381)	(0.09003)
Observations	2,124	2,124	1,981	1,980	2,124	2,124	1,981	1,980	2,124	2,124	1,981	1,980
Kleibergen-Paap rk Wald F	11.99	11.98	12.16	11.34	14.09	14.07	14.18	13.12	9.454	9.448	9.877	9.292
Root MSE	0.530	0.529	0.510	0.384	0.533	0.532	0.514	0.388	0.528	0.527	0.508	0.381
	Panel B (Own > median land size "2.5 acres")											
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.02393	0.03411	0.04195	0.05320								
	(0.08700)	(0.08647)	(0.08249)	(0.07956)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.04010	0.04961	0.05214	0.06666				
					(0.08872)	(0.08802)	(0.08516)	(0.07989)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.03614	0.04647	0.05621	0.06798
									(0.08444)	(0.08457)	(0.08235)	(0.07872)
Observations	2,170	2,168	2,124	2,122	2,170	2,168	2,124	2,122	2,170	2,168	2,124	2,122
Kleibergen-Paap rk Wald F	9.561	9.544	9.240	9.008	10.88	10.87	10.40	10.10	8.639	8.624	8.362	8.185
Root MSE	0.507	0.505	0.492	0.339	0.507	0.505	0.492	0.339	0.507	0.505	0.492	0.339
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*

Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Disaggregating the analysis by location (Rural Vs Urban)

Table A27: Second stage: Effects of refugee presence on household welfare disaggregated by location, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Panel A (Rural)											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	0.06253	0.06228	0.08484*	0.07676*								
	(0.04168)	(0.04158)	(0.04754)	(0.04500)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					0.06816	0.06820	0.09680*	0.08946*				
					(0.04171)	(0.04169)	(0.05031)	(0.04732)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									0.07232	0.07187	0.08732*	0.08061
									(0.04870)	(0.04854)	(0.05182)	(0.04972)
Observations	4,541	4,538	3,648	3,640	4,541	4,538	3,648	3,640	4,541	4,538	3,648	3,640
Kleibergen-Paap rk Wald F	17.14	17.14	13.38	13.06	15.73	15.72	12.36	12.12	14.56	14.56	11.89	11.61
Root MSE	0.581	0.580	0.531	0.363	0.581	0.581	0.531	0.364	0.581	0.581	0.531	0.364
	Panel B (Urban)											
Log of refugees (50km) predicted by Log of Distance IV (mean border distance)	-0.29374	-0.30683	-0.02938	-0.01592								
	(0.39856)	(0.40022)	(0.12435)	(0.12484)								
Log of refugees (50km) predicted by Log of Distance IV (square of mean border distance)					-0.25184	-0.26495	0.03603	0.05103				
					(0.36502)	(0.36532)	(0.14931)	(0.15503)				
Log of refugees (50km) predicted by Log of Distance IV (square-root of mean border distance)									-0.30729	-0.32002	-0.06991	-0.05700
									(0.40744)	(0.40861)	(0.11831)	(0.11830)
Observations	902	902	450	450	902	902	450	450	902	902	450	450
Kleibergen-Paap rk Wald F	4.440	4.434	3.361	3.494	4.610	4.609	3.254	3.339	4.044	4.042	3.214	3.393
Root MSE	0.697	0.695	0.499	0.322	0.692	0.690	0.499	0.325	0.699	0.697	0.500	0.322

Included controls

Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*
Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

Table A28: Second stage: Effects of refugee presence on household welfare disaggregated by location, with analysis at cluster level and the distance weighted refugee index at 100km from the clusters (Panel 2009-2012)

	Log of welfare (consumption aggregate per adult equivalent)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
						Panel A (Rural)						
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	0.10990	0.10939	0.13063*	0.11843*								
	(0.06781)	(0.06764)	(0.07237)	(0.06446)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					0.11814*	0.11812*	0.14870*	0.13834**				
					(0.06773)	(0.06767)	(0.07655)	(0.06846)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									0.11739	0.11660	0.12254*	0.11292*
									(0.07433)	(0.07408)	(0.07335)	(0.06564)
Observations	4,541	4,538	3,648	3,640	4,541	4,538	3,648	3,640	4,541	4,538	3,648	3,640
Kleibergen-Paap rk Wald F	15.20	15.20	13.19	12.45	18.02	18.03	15.24	14.30	12.58	12.59	11.36	10.80
Root MSE	0.582	0.581	0.532	0.364	0.582	0.582	0.533	0.365	0.582	0.582	0.532	0.364
						Panel B (Urban)						
Log of refugees (100km) predicted by Log of Distance IV (mean border distance)	-0.34333	-0.35743	-0.16438	-0.10562								
	(0.42013)	(0.42162)	(0.64743)	(0.80678)								
Log of refugees (100km) predicted by Log of Distance IV (square of mean border distance)					-0.31907	-0.33449	0.26373	0.48580				
					(0.42075)	(0.42024)	(1.21304)	(1.75363)				
Log of refugees (100km) predicted by Log of Distance IV (square-root of mean border distance)									-0.31919	-0.33145	-0.33726	-0.31661
									(0.37713)	(0.37849)	(0.48258)	(0.62433)
Observations	902	902	450	450	902	902	450	450	902	902	450	450
Kleibergen-Paap rk Wald F	2.202	2.203	3.141	2.485	2.253	2.254	1.365	0.821	2.082	2.083	3.667	3.165
Root MSE	0.681	0.678	0.498	0.321	0.679	0.677	0.502	0.337	0.679	0.676	0.499	0.321
Included controls												
Exogenous controls (age, agesq, sex "male==1")	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*

Other controls (HH size, marital status, education, occupation, other income sources, land ownership)	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*	*No*	*No*	*Yes*	*Yes*
Year fixed effects	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Cluster fixed effects	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*	*Yes*	*Yes*	*Yes*	*No*
Household fixed effects	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*	*No*	*No*	*No*	*Yes*

For tables A29 and A35, year and cluster fixed effects are included in regression (1) to (3). In Regression (4), household fixed effects replace the cluster fixed effects. All the other controls are included in regression (4), but the time invariant ones drop off. *Not all controls shown in table (from Table A31)*. Sampling weights are considered and Standard errors clustered at the cluster level in all regressions. Robust standard errors in parentheses. Significance level are: **** p<0.01, ** p<0.05, * p<0.1.*

Table A29: OLS; Effects of refugee presence on household welfare disaggregated by time-varying main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare(consumption aggregate per adult equivalent)		
	(1)	(2)	(3)
Log of refugees (50km)	0.0219*	0.0219*	0.0263*
	(0.0114)	(0.0114)	(0.0136)
Log of refugees(50km)#Commercial farming	0.0515*	0.0515*	0.0770***
	(0.0280)	(0.0279)	(0.0276)
Log of refugees(50km)#Wage employment	0.0143	0.0141	0.0032
	(0.0121)	(0.0121)	(0.0129)
Log of refugees(50km)#Non-Ag. self-employment	-0.0136	-0.0136	-0.0010
	(0.0127)	(0.0127)	(0.0115)
HH head age		0.0015	0.0123**
		(0.0050)	(0.0056)
Age squared		-0.0000	-0.0001
		(0.0000)	(0.0001)
HH head sex (male)		-0.0000	0.0213
		(0.0348)	(0.0379)
Household size			-0.0259***
			(0.0054)
HH head marital status			
Married monogamously			-0.3770**
			(0.1466)
Married polygamously			-0.3238**
			(0.1542)
Separated (divorced/widowed)			-0.3659**
			(0.1562)
HH head education level			
Completed primary sch			0.2182***
			(0.0370)
HH main source of income			
Commercial farming	0.1835*	0.1829*	0.1777*
	(0.0962)	(0.0961)	(0.0951)
Wage employment	-0.0646	-0.0661	-0.1020**
	(0.0452)	(0.0452)	(0.0476)
Non-agricultural self-employment	0.1485***	0.1459***	0.0766*
	(0.0410)	(0.0410)	(0.0429)
Other source of HH income			
Property income and investments			0.2156**
			(0.0842)
Transfers and other benefits			0.1191***
			(0.0408)
HH Asset			
Own > median size of land (2.5 acres)			0.1913***
			(0.0319)
Observations	5,453	5,450	4,105
R-squared	0.3966	0.3967	0.3911

Table A30: OLS; Effects of refugee presence on household welfare disaggregated by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of welfare(consumption aggregate per adult equivalent)		
	(1)	(2)	(3)
Log of refugees (50km)	0.0183	0.0183	0.0175
	(0.0132)	(0.0131)	(0.0188)
Log of refugees(50km)#To Commercial farming	0.0772**	0.0772**	0.0731**
	(0.0313)	(0.0313)	(0.0306)
Log of refugees(50km)#To Wage employment	0.0206	0.0206	0.0400**
	(0.0166)	(0.0167)	(0.0172)
Log of refugees(50km)#To Non-Agric self-employment	-0.0048	-0.0046	0.0129
	(0.0153)	(0.0153)	(0.0209)
HH head age		0.0033	0.0141**
		(0.0061)	(0.0070)
Age squared		-0.0000	-0.0001
		(0.0001)	(0.0001)
HH head sex (male)		-0.0077	0.0092
		(0.0385)	(0.0469)
Household size			-0.0220***
			(0.0065)
HH head marital status			
Married monogamously			-0.5175***
			(0.1943)
Married polygamously			-0.4436**
			(0.2025)
Separated (divorced/widowed)			-0.5121**
			(0.2062)
HH head education level			
Completed primary sch			0.2557***
			(0.0418)
HH main source of income			
Change to Commercial farming	0.1746	0.1761	0.2540
	(0.1614)	(0.1623)	(0.1605)
Change to Wage employment	-0.1500**	-0.1503**	-0.1562**
	(0.0598)	(0.0600)	(0.0616)
Change to Non-agricultural self-employment	0.0845	0.0835	0.0577
	(0.0713)	(0.0714)	(0.0599)
Other source of HH income			
Property income and investments			0.2266**
			(0.0912)
Transfers and other benefits			0.1209**
			(0.0508)
HH Asset			
Own > median size of land (2.5 acres)			0.1818***
			(0.0363)
Observations	3,734	3,734	2,763
R-squared	0.4057	0.4059	0.4213

Table A31: OLS; Effects of refugee presence on household total agriculture production by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of Total Agricultural Production (UGX)		
	(1)	(2)	(3)
Log of refugees (50km)	-0.0012	0.0054	0.0089
	(0.0258)	(0.0257)	(0.0284)
Log of refugees(50km)#To Commercial farming	0.2430**	0.2360*	0.2015**
	(0.1172)	(0.1266)	(0.0824)
Log of refugees(50km)#To Wage employment	-0.0097	-0.0184	0.0128
	(0.0367)	(0.0362)	(0.0314)
Log of refugees(50km)#To Non-Agric self-employment	0.0468	0.0397	0.0620*
	(0.0365)	(0.0359)	(0.0344)
HH head age		0.0725***	0.0363***
		(0.0116)	(0.0116)
Age squared		-0.0007***	-0.0004***
		(0.0001)	(0.0001)
HH head sex (male)		0.5071***	0.0519
		(0.0658)	(0.0863)
Annual mean temperature		0.0791	0.0103
		(0.0791)	(0.1077)
Average 12 months total rainfall		0.0006	0.0035**
		(0.0014)	(0.0017)
Household size			0.0516***
			(0.0136)
Experienced shocks			-0.0263
			(0.0707)
HH head marital status			
Married monogamously			-0.1104
			(0.2353)
Married polygamously			-0.1336
			(0.2498)
Separated (divorced/widowed)			-0.4197
			(0.2603)
HH head education level			
Completed primary sch			0.2889***
			(0.0653)
HH main source of income			
Change to Commercial farming	0.3538	0.3385	0.1476
	(0.3001)	(0.2939)	(0.3275)
Change to Wage employment	-0.2378**	-0.2134*	-0.1889*
	(0.1176)	(0.1170)	(0.1065)
Change to Non-agricultural self-employment	-0.0143	-0.0359	-0.1284
	(0.1127)	(0.1086)	(0.1063)
Other source of HH income			
Property income and investments			0.0689
			(0.1483)
Transfers and other benefits			-0.0070
			(0.1082)
HH Asset			
Own > median size of land (2.5 acres)			0.5042***
			(0.0689)
Observations	3,124	3,123	2,641
R-squared	0.3602	0.4005	0.4894

Table A32: OLS; Effects of refugee presence on household total vegetables production by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of Total Vegetables Production (UGX)		
	(1)	(2)	(3)
Log of refugees (50km)	-0.0242	-0.0187	-0.0101
	(0.0307)	(0.0307)	(0.0312)
Log of refugees(50km)#To Commercial farming	0.2820**	0.2789**	0.2855***
	(0.1316)	(0.1386)	(0.0817)
Log of refugees(50km)#To Wage employment	-0.0026	-0.0159	0.0325
	(0.0462)	(0.0457)	(0.0347)
Log of refugees(50km)#To Non-Agric self-employment	0.0550	0.0496	0.0853**
	(0.0402)	(0.0399)	(0.0351)
HH head age		0.0643***	0.0388***
		(0.0128)	(0.0123)
Age squared		-0.0006***	-0.0004***
		(0.0001)	(0.0001)
HH head sex (male)		0.3794***	-0.0042
		(0.0654)	(0.0858)
Annual mean temperature		-0.0052	-0.0643
		(0.0689)	(0.1212)
Average 12 months total rainfall		-0.0007	0.0007
		(0.0009)	(0.0018)
Household size			0.0491***
			(0.0145)
Experienced shocks			0.0215
			(0.0855)
HH head marital status			
Married monogamously			-0.0681
			(0.2809)
Married polygamously			-0.0522
			(0.2905)
Separated (divorced/widowed)			-0.3166
			(0.2896)
HH head education level			
Completed primary sch			0.2295***
			(0.0637)
HH main source of income			
Change to Commercial farming	0.2832	0.2606	0.0899
	(0.3182)	(0.3117)	(0.3299)
Change to Wage employment	-0.0935	-0.0647	-0.1240
	(0.1346)	(0.1331)	(0.1211)
Change to Non-agricultural self-employment	-0.0379	-0.0591	-0.1308
	(0.1116)	(0.1095)	(0.1226)
Other source of HH income			
Property income and investments			-0.1350
			(0.1451)
Transfers and other benefits			0.0197
			(0.0984)
HH Asset			
Own > median size of land (2.5 acres)			0.3106***
			(0.0643)
Observations	2,957	2,956	2,511
R-squared	0.2343	0.2649	0.3439

Table A33: OLS; Effects of refugee presence on household total Fruits production by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of Total Fruits Production (UGX)		
	(1)	(2)	(3)
Log of refugees (50km)	-0.0596	-0.0427	-0.0534
	(0.0592)	(0.0560)	(0.0520)
Log of refugees(50km)#To Commercial farming	-0.0539	-0.0532	0.0165
	(0.0530)	(0.0581)	(0.0588)
Log of refugees(50km)#To Wage employment	0.0133	-0.0004	0.0175
	(0.0453)	(0.0491)	(0.0435)
Log of refugees(50km)#To Non-Agric self-employment	0.0080	-0.0015	0.0440
	(0.0451)	(0.0446)	(0.0500)
HH head age		0.0530***	0.0073
		(0.0170)	(0.0164)
Age squared		-0.0004***	-0.0000
		(0.0002)	(0.0002)
HH head sex (male)		0.4980***	0.0805
		(0.0971)	(0.1421)
Annual mean temperature		0.0414	-0.0703
		(0.1153)	(0.2210)
Average 12 months total rainfall		0.0008	0.0062**
		(0.0025)	(0.0030)
Household size			0.0638***
			(0.0212)
Experienced shocks			-0.0839
			(0.0760)
HH head marital status			
Married monogamously			0.0230
			(0.2731)
Married polygamously			-0.0527
			(0.2993)
Separated (divorced/widowed)			-0.2684
			(0.3352)
HH head education level			
Completed primary sch			0.3707***
			(0.0927)
HH main source of income			
Change to Commercial farming	1.5907***	1.5266***	0.9465***
	(0.2709)	(0.2644)	(0.2440)
Change to Wage employment	-0.3141**	-0.2491	-0.2371
	(0.1474)	(0.1544)	(0.1596)
Change to Non-agricultural self-employment	-0.0075	0.0063	-0.0465
	(0.1675)	(0.1607)	(0.1523)
Other source of HH income			
Property income and investments			0.3346
			(0.2359)
Transfers and other benefits			0.0351
			(0.1577)
HH Asset			
Own > median size of land (2.5 acres)			0.6417***
			(0.0973)
Observations	1,706	1,706	1,506
R-squared	0.5762	0.5964	0.6544

Table A34: OLS; Effects of refugee presence on household total Cereals production by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Log of Total Cereals Production (UGX)		
	(1)	(2)	(3)
Log of refugees (50km)	-0.0394	-0.0329	-0.0226
	(0.0392)	(0.0395)	(0.0464)
Log of refugees(50km)#To Commercial farming	0.0073	-0.0082	0.0221
	(0.0887)	(0.0863)	(0.0644)
Log of refugees(50km)#To Wage employment	-0.0042	-0.0043	0.0108
	(0.0462)	(0.0463)	(0.0471)
Log of refugees(50km)#To Non-Agric self-employment	0.0119	0.0073	0.0522
	(0.0534)	(0.0525)	(0.0553)
HH head age		0.0577***	0.0306*
		(0.0136)	(0.0178)
Age squared		-0.0005***	-0.0003*
		(0.0001)	(0.0002)
HH head sex (male)		0.4698***	0.2568**
		(0.0844)	(0.1061)
Annual mean temperature		0.1572	0.1050
		(0.1143)	(0.1141)
Average 12 months total rainfall		0.0031	0.0064**
		(0.0021)	(0.0026)
Household size			0.0380**
			(0.0150)
Experienced shocks			-0.0530
			(0.0987)
HH head marital status			
Married monogamously			0.1286
			(0.3281)
Married polygamously			0.0653
			(0.3493)
Separated (divorced/widowed)			0.0660
			(0.3368)
HH head education level			
Completed primary sch			0.2547***
			(0.0843)
HH main source of income			
Change to Commercial farming	0.4463*	0.4674*	0.4492
	(0.2619)	(0.2548)	(0.2955)
Change to Wage employment	-0.3282**	-0.3324**	-0.3595**
	(0.1637)	(0.1423)	(0.1448)
Change to Non-agricultural self-employment	0.0900	0.0747	-0.0344
	(0.1475)	(0.1412)	(0.1382)
Other source of HH income			
Property income and investments			0.2074
			(0.2160)
Transfers and other benefits			0.1101
			(0.1087)
HH Asset			
Own > median size of land (2.5 acres)			0.3492***
			(0.0921)
Observations	2,471	2,470	2,110
R-squared	0.2808	0.3098	0.3653

Table A35: OLS; Effects of refugee presence on household land size ownership by change in main source of income, with analysis at cluster level and the distance weighted refugee index at 50km from the clusters (Panel 2009-2012)

	Land size ownership (Acres)		
	(1)	(2)	(3)
Log of refugees (50km)	0.2253	0.2451	0.3313
	(0.3017)	(0.2987)	(0.3342)
Log of refugees(50km)#To Commercial farming	0.8288	0.8102	1.2021
	(0.8192)	(0.7906)	(0.7957)
Log of refugees(50km)#To Wage employment	0.3728	0.3744	0.3836
	(0.2625)	(0.2627)	(0.2724)
Log of refugees(50km)#To Non-Agric self-employment	0.1166	0.1264	0.0477
	(0.2071)	(0.1967)	(0.2630)
HH head age		0.1692*	-0.0314
		(0.0946)	(0.1361)
Age squared		-0.0010	0.0008
		(0.0010)	(0.0014)
HH head sex (male)		1.2921**	0.3418
		(0.5019)	(0.5911)
Annual mean temperature		0.8442**	0.6335
		(0.4191)	(0.6489)
Average 12 months total rainfall		0.0057	0.0278**
		(0.0057)	(0.0130)
Household size			0.2879***
			(0.0913)
Experienced shocks			0.2432
			(0.5866)
HH head marital status			
Married monogamously			5.6866*
			(3.3881)
Married polygamously			6.6724*
			(3.4656)
Separated (divorced/widowed)			6.7381*
			(3.6209)
HH head education level			
Completed primary sch			2.3510***
			(0.7655)
HH main source of income			
Change to Commercial farming	6.1959***	6.2227***	5.2403**
	(2.2836)	(2.2195)	(2.3430)
Change to Wage employment	-0.4692	-0.3335	-0.0200
	(0.5446)	(0.5404)	(0.5587)
Change to Non-agricultural self-employment	-0.6829*	-0.5843	-0.6626
	(0.3935)	(0.4095)	(0.5305)
Other source of HH income			
Property income and investments			-0.2513
			(1.0703)
Transfers and other benefits			0.0948
			(0.5247)
HH Asset			
Own > median size of land (2.5 acres)			3.0484***
			(0.5257)
Observations	3,174	3,173	2,677
R-squared	0.1778	0.1899	0.2358

Food categories/classification

Fruits	Vegetables	Cereals	Trees/Others
Pumpkins	Beans	Wheat	Cotton
Oranges	Field Peas	Barley	Tobacco
Pawpaw	Cow Peas	Rice	Coffee
Pineapples	Pigeon Peas	Maize	Cocoa
Banana (Beer, food, sweet)	Chick Peas	Finger millet	Tea
Mango	Ground nuts	Sorghum	Vanilla
Jackfruit	Soya beans	Simsim (sesame)	Black wattle
Passion fruit	Sunflower	Sugarcane	Natural pastures
	Cabbage		Improved pastures
	Tomatoes		Natural forest trees
	Carrots		Plantation trees
	Onions		Bamboo
	Dodo (Amaranthus)		Other forest trees
	Eggplants		Bush
	Avocado		Fallow
	Ginger		
	Curry		
	Oil palm		
	Irish potatoes		
	Sweet potatoes		
	Cassava		
	Yams		
	Coco Yams		