Poverty Reduction in a Refugee-Hosting Economy

A Natural Experiment

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Abstract

The role of migration in reducing poverty in developing countries has been investigated mainly from the perspective of migrants and their relatives. This paper exploits the time and spatial variations in the way households in the region of Kagera (Tanzania) traced between 1991 and 2004 have been affected by massive refugee inflows to assess how migration may affect poverty in the hosting communities. Large population inflows from Burundi and Rwanda have improved the welfare of the hosting population, particularly for the poor. Despite the process of structural transformation observed in the refugee-hosting economy, such pro-poor development is mainly explained by improved agricultural labor productivity and income diversification among the poor.

Keywords: poverty, refugees, migration, structural transformation, Tanzania
JEL Classification: *J21, J61, O15, O1*

1. Introduction

Understanding how economic growth contributes to poverty reduction has been at the core of development economics since the works by Lewis (1954). A large debate has since been raging regarding the determinants of pro-poor or broad-based economic development and in particular the sectoral contribution to poverty reduction. While significant progress has been made, identifying causal relationships remains a major challenge and limits our ability to translate findings into policy. In that respect, this paper exploits large and unanticipated movements of population from neighboring countries to the region of Kagera in Tanzania to contribute to these long-standing debates.

Section 2 sheds new light on the role of migration as a potential driver of poverty reduction. The issue has been investigated mainly in developing countries, either from the migrants' perspectives (Rosenzweig 2007; Beegle, De Weerdt, and Dercon 2011; Grogger and Hanson 2011), their countries of origin (Adams and Page 2005; Hanson 2010, for a review), or the households directly linked to migrants (Scott Rozelle and deBrauw 1999; Woodruff and Zenteno 2007; Yang 2008). Other studies have investigated the impact of migration flows on the hosting economies through the labor markets (Borjas 2005; Card 2005; Ottaviano and Peri 2011; Manacorda, Manning, and Wadsworth 2011), through the health systems (Razin and Sadka 1999), through trade links (Rauch and Trinidade 2002; Peri and Requena 2010), or through the housing markets (Saiz 2007). However, these studies have focused on developed countries. Few economic analyses have assessed the way migration can affect the welfare of receiving communities in developing countries. This paper contributes to that literature by investigating how massive movements of population affect the level of poverty of the hosting population. Furthermore, it can be seen as a complement to Beegle, De Weerdt, and Dercon (2011), who use similar data to study migratory consequences but from the migrants' perspectives. In terms of methods, a natural experiment is exploited in this paper in the tradition of labor economics, as in Card (1990), Hunt (1992), and Friedberg (2001); but unlike in these papers, our analysis is applied to a developing country and in a rural setting.

Section 3 relates to the literature aiming at assessing the sectoral contribution to poverty reduction. In particular, the role of agricultural development in reducing poverty dates back to the early works by Lewis (1954). However, research has faced major difficulties in identifying a causal relationship. It is indeed difficult to solve the *chicken–egg* problem of knowing whether agricultural development leads to poverty reduction or the reverse (Gardner and Tsakok 2007). Since Ravallion and Datt (1996) proposed a seminal methodology to decompose the sectoral contributions to poverty reduction, new empirical evidence has been advanced (de Janvry and Sadoulet 2009, for a review). However, Section 3 proposes an alternative microlevel approach that adds value to the current state of the empirical knowledge in two directions. First, most studies provide estimates of sectoral poverty elasticities either at the cross-country level (Christiaensen and Demery 2007; Loayza and Raddatz 2010; Christiaensen, Demery, and Kuhl 2011) or at the subnational level (Ravallion and Datt 1996, Ravallion and Chen 2007; Suryadhi, Suryadarma, and Sumarto 2009, for India, China, and Indonesia, respectively). While cross-country or cross-province panels bear the advantage of being more easily generalizable, the risks of omitted variable bias and spurious parallel trends shed doubts on their ability to identify causal channels of transmission. The use of household panel data by Christiaensen, Pan, and Wang (2010) constitutes an exception. These authors investigate the drivers of poverty reduction for two provinces in China. Based on a similar adaptation of Ravallion and Datt's (1996) method, this analysis explores how changes in sectoral labor productivity translate into household levels of poverty in the region of Kagera, Tanzania. Second, Section 3 introduces an alternative approach to the use of long time-series observations by exploiting the exogenous variation of a natural experiment. While this approach is largely dictated by the nature of the data, the method offers some advantages for the internal validity of the study. The use of lags in other studies does not immune any researcher to deal with the unobserved omitted variable that is likely to affect both labor productivity and poverty. As pointed out by Christiaensen, Pan, and Wang (2010), even the use of a household fixed effect and time-varying characteristics cannot completely rule out this potential risk. Second, modeling explicitly

the source of exogenous variations in labor productivity paves the way for a context-specific discussion of what drives the results. Section 3 indeed discusses the possible explanations underlying a different sectoral contribution to poverty reduction and qualifies the external validity of these results. In particular, the paper explores how the process of structural transformation may appear disconnected from the realities of the poor while having important implications for their livelihoods (through income diversification). Finally, Section 4 concludes.

2. Poverty Reduction in a Refugee-Hosting Economy

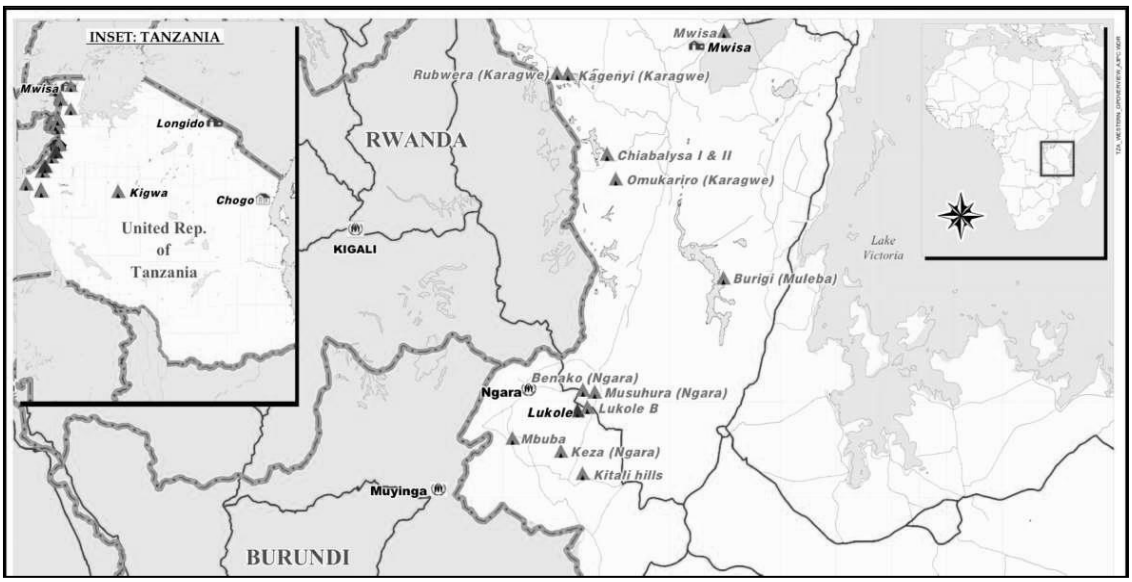
Context

The Kagera region is a very remote region in northwestern Tanzania located between Lake Victoria, Uganda, Rwanda, and Burundi. Kagera is one of the poorest regions of the country in terms of income per capita, with an average of 149,828 Tanzanian shillings (TSh, that is, US$166 a year) per capita (National Bureau of Statistics 2003). In 2002, about two million people lived in a region of 29,241 square kilometers and relied mainly on subsistence agriculture. One particularity of this region results from its recent history of hosting refugees, which makes it an extraordinary *laboratory* for studying the effects on local populations. The magnitude of the phenomenon makes Kagera unique. Starting on October 21, 1993, between 250,000 and 300,000 Burundians fled by the end of 1993 into Tanzania following the assassination of the president of Burundi. Only a few months later, a new influx of 250,000 refugees came from Rwanda on April 28 and 29, 1994, according to Rutinwa (2002, 28). This sudden influx resulted from the crash of the plane carrying the presidents of Rwanda and Burundi, known as the triggering factor of the Rwandan genocide. This movement, described by the United Nations High Commissioner for Refugees (UNHCR) as the largest and fastest exodus it had ever witnessed, was followed in the next two months by nearly a million refugees fleeing Rwanda. In 1995, about 700,000 refugees remained in Kagera, whose local-born population was about 1.5 million at that time.

As pointed out by Maystadt and Verwimp (2009), the unanticipated and localized nature of these events provides a tool to isolate the impact of the refugee influx from other factors. The unexpected nature of these events linked to political assassinations is also underlined by Alix-Garcia and Saah (2010). Refugees were hosted in Kagera in city-sized camps. The unexpectedness, together with the sheer number of refugees, prevented any organized group, such as government or UNHCR, from directing the refugees to the one or more locations across the region designated to host them. Given the prohibitive costs of transporting them, UNHCR and the Ministry of Home Affairs had to site the camps within a very small radius. As can be seen in Figure 2.1 and contrary to UNHCR policy, this resulted in camps located very close to the borders. While the circumstances for the camps at these locations were not ideal, to say the least, the fact that Tanzania was caught unprepared and had difficulty finding a place for hundreds of thousands of refugees removes, to a large extent, a potential problem of endogeneity. We will discuss this issue further under the heading, "Is the Establishment of Refugee Camps Exogenous?". Furthermore, a new refugee policy implemented by the Tanzanian government restricted the movement of the refugees to 4 kilometers around the camps.[1] These movement restrictions, coupled with geographical features limiting the spatial spread of the impact (Baez 2011), provide an exceptional framework for distinguishing refugee-hosting areas from others.

[1] Tanzania has a long history of hosting refugees. In 1972, refugees fled from Burundi and were directed toward the so-called old settlements. However, these refugees were very distinct from the 1993–1994 waves. The former refugees were not settled into closed camps; instead, they were targeted by an open-door policy with the aim to integrate these newcomers (even through naturalization) and ensure the self-sustainability of their livelihoods the Tanzanian territory. These refugees were located far from the borders of their country of origin (Rutinwa 2002). Other refugees also came from the Democratic Republic of Congo starting in 1997. However, our region of interest, Kagera, did not host these refugees. Congolese camps are located mainly in the neighboring region of Kigoma.

Figure 2.1—Location of refugee camps in the region of Kagera, Tanzania



Source: UNHCR Regional Spatial Analysis Lab (Nairobi) and fieldwork geographic coordinates.

Observations

Following several interviews conducted in the areas surrounding the Kagera refugee camps, refugees are reported to have affected the local population by various channels (Maystadt and Verwimp 2009). First, the labor markets have been strongly disrupted. While agricultural workers faced fiercer competition from refugees working on the fields, the nonagricultural workers benefited from increased job opportunities provided by nongovernmental organizations (such as Red Cross, Care, Tanganyika Christian Refugee Service, and Norwegian People's Aid) and United Nations agencies (UNHCR, World Food Programme). Second, surging prices on the good markets (with the exception of maize, which was freely delivered by the World Food Programme inside the camps) resulted in the short run from new demand not only by local and international workers of these organizations with a much higher purchasing power but also by the refugees themselves. Farmers were able to respond to this increase in demand by using the refugees as a cheap labor force. Furthermore, refugees coming from highly densely populated countries are reported to have possibly transmitted new agricultural techniques, which increased productivity in the agricultural sector. Agricultural production was reported to have doubled in some villages near large refugee camps. The nonagricultural sector is also reported to have largely developed following the refugees' arrival. New varieties of nonfood items were introduced in the refugee-hosting areas to meet international workers' different tastes. Several businesses mushroomed around the refugee camps but with some selection consequences. Some of the local existing petty businesses are indeed reported to have been driven out of business due to increased competition from more efficient entrepreneurs coming from other regions. Effects on the goods and labor markets are further illustrated through fieldwork observations and a literature review by Maystadt and Verwimp (2009).[2]

The economic impact of refugee settlements on local economies does not seem to have attracted very much research interest. Chambers (1986) is the first to have argued that the presence of a refugee camp has mixed consequences for the host population through price increases, wage competition, and

[2] At least short-run negative effects such as environmental degradation and security issues are also reported in refugee-hosting areas. While acknowledging the existence of these possible effects, such negative externalities should be captured by the treatment effect and should not jeopardize the identification strategy introduced in Section 2. More information is to be found in Maystadt and Verwimp (2009).

competition for natural resources. Since then, authors such as Kuhlman (2002), Whitaker (1999), and Landau (2004) have provided some anecdotal evidence of the strong impact of refugees of the hosting population. In recent years, economic research has improved our understanding of the issue. First, Alix-Garcia and Saah (2010) assess the impact of proximity to a refugee camp on agricultural prices between 1995 and 1998. They find a significant increase in the prices of some agricultural goods (bananas, beans, and milk) and a decrease in the price of the aid-delivered good (maize). They also test the impact of massive refugee inflows on the holding of assets, suggesting a positive impact on the acquisition of more valuable assets. Second, Maystadt and Verwimp (2009) empirically test the differentiated impact on the local population through the goods and the labor markets. The impact is found to largely depend on the initial occupation of the households, creating winners and losers among the refugee-hosting areas.[3] The major contribution of this paper is to understand how such refugee inflows may have affected the level of poverty in the hosting economy and how such exogenous variation may be used to assess the contribution of sectoral labor productivity to changes in poverty.

Data and Identification Strategy

Like Maystadt and Verwimp (2009), this paper makes use of the Kagera Health and Development Survey (KHDS) dataset collected by Economic Development Initiatives (EDI) and the World Bank (Beegle, De Weerdt, and Dercon 2006). Based on the World Bank LSMS (Living Standards Measurement Study) standards, the KHDS data provide a very comprehensive survey on several dimensions of the individual and household well-being. The KHDS interviewed 915 households and their members up to four times from fall 1991 to January 1994 (four waves). Households were selected from 51 communities in the six districts of the Kagera region. In addition to the representativeness of the sample, one interesting feature of this survey is the outstanding exercise of tracing most individuals from the original 915 households about 10 years later, in 2004. Because people had moved out from their original households, the KHDS 2004 interviewed about 2,770 households and their members, including those having moved outside their village of origin, the Kagera region, and even Tanzania. As indicated by Beegle, De Weerdt, and Dercon (2006), the field team achieved an excellent rate of recontact of 93 percent.

These data are particularly adequate for assessing the impact of the refugee inflows of 1993–1994 on the local population. First, it is certain that the first wave of the KHDS surveys had been undertaken before October 21, 1993, the date of the assassination of the president of Burundi, signaling the start of the refugee crisis in the Kagera region. Therefore, the data allow distinguishing the effect of the refugee inflows from some initial differences between villages or households. Second, the location of the different villages throughout all the region introduces key heterogeneity in the sample, depending on whether the households are living in a village close to a refugee camp or not. By exploiting both time and spatial variations in the way households traced between 1991 and 2004 have been affected by the refugee inflows originating from Burundi (1993) and Rwanda (1994), the identification strategy follows Maystadt and Verwimp (2009). We estimate the effect of the refugee presence, defined below as $RI_{v,t}$, along with other explanatory variables, defined at the household level ($X_{h,t}$) or the village level ($Q_{v,t}$), on several economic outcomes ($P_{h,t}$) of household h residing in village v at time t:

$$P_{h,t} = \beta_0 + \beta_1 \, log\left(RI_{v(h),t}\right) + \beta_2 \, X_{h,t} + \beta_3 \, Q_{v,t} + \alpha_h + \alpha_t + \varepsilon_{h,t} \qquad (1)$$

In our baseline results, the dependent variable will be constructed based on the real consumption per adult equivalent, computed for each household. The adult equivalent transformation is applied using the method proposed by Collier et al. (1986) for Tanzania, and the Laspeyres index is used for price correction. The aggregated consumption data defined only in 1991 and 2004 have been used for comparability reasons (recall periods, common definition of components). When migrants are included, consumption data are

[3] We should also note that Baez (2011) assesses the short- and long-term effects of hosting refugees on the health conditions of children. Baez offers evidence of adverse impacts, almost one and a half years after the shock, on children's health.

corrected for price differences between regions by applying a Fisher index. The real consumption data are then used to construct different measures of poverty. First, the poverty status of any household is based on the poverty line of 109,663 Tanzanian shillings (TSh), used by Beegle, De Weerdt, and Dercon (2011) to yield the same poverty rate of the 2000/2001 National Household Budget Survey estimate for Kagera. As a robustness check, three standard poverty measures are constructed at the village level: the headcount index, the poverty gap index, and the squared poverty gap index introduced by Foster, Greer, and Thorbecke (1984).

The treatment variable is defined to capture the proximity to the camps, taking into account the diversity of size of these camps. Information collected during fieldwork indeed helps to proxy the effect of the establishment of a refugee camp by the distance between any village and the refugee camps as well as the estimated number of refugees by camp (using the 1995 estimates of the refugee population). The so-called refugee index (RI) results from the sum of the refugee population weighted by an inverse distance function: $RIvt = \sum_{c=1}^{13} \frac{\mathrm{Pop_c}}{\mathrm{d}_{\mathrm{v,c}}^{\alpha}}$, where c ranges from 1 to 13 refugee camps and v from 1 to 51 villages. Following Head and Mayer (2004), α is set to 1 and the resulting ratio is transformed into logarithm (to reduce the importance of some highly refugee-exposed villages). For consistency and efficiency reasons, we will also control for household and village characteristics, respectively denoted $X_{h,t}$ and $\mathrm{Q_{v,t}}$. The household variables include household head characteristics such as the age of the household head; a dummy indicating whether the household head is literate; and dummies indicating the gender and marital status of the household head (taking married male as the reference category) and household characteristics such as the proportion of literate household members (as a proxy for human capital endowments), a split-off household (for example, a child in 1991 creating a new household by 2004), and the number of adults (transformed into logarithm).

For the village variables, we construct for each village in 1991 and 2004 the five-year average number of annual rainy days (before 1991 and 2004). Climatic variables are based on monthly rainfall data in total millimeters of total rainy days per month for 21 weather stations in Kagera, available from the Tanzania Meteorological Agency. Village characteristics also include variables related to the occurrence of natural disasters in the last 10 years. We classify natural disasters as the occurrence of flood, drought, and fire; crop-related disasters as the occurrence of crop diseases and insect damage; and as a last category, the epidemic disaster. To control for unobserved characteristics that may affect both the dependent variables and the explanatory variables, a household fixed effect is introduced, which in a two-period setting consists of identifying the relationship between the changes of the dependent variable and the changes of the variables of interest.[4] A time dummy is also included to capture all time-varying phenomena common across locations. Standard errors are clustered at the village level.

The baseline estimations exclude all the households migrated out of the region of Kagera to another village between 1991 and 2004. This reduces the sample from 2,770 households to about 1,727 households that have been followed over time.[5] However, the results of this paper do not depend on this exclusion and will therefore be discussed in light of their inclusion (see "Attrition: Role of Migration").

Table 2.1 presents descriptive statistics on real consumption, the level of poverty, and the income structure in refugee-hosting areas (defined as such for villages with an RI index whose value is below the median). It is actually not surprising to observe that the poor rely more on agriculture for income generation (95 percent for the poor versus 83 percent for the nonpoor) and are less involved in nonagricultural activities (91 percent versus 75 percent). The "Identifying Assumptions" section will discuss the initial differences in poverty and share of agricultural income; Table 2.1 indicates that the income structure of the poor in 1991, however, is relatively similar between the refugee-hosting areas and the others. Even more striking is that the changes in real consumption per adult equivalent and the reduction in poverty have been

[4]Results are robust to the use of a village fixed effect. The use of a household fixed effect improves the efficiency of the estimations.

[5]The next sections will refer to the extended sample of 2,442 and 2,770 households in the migration regressions of Table 2.3, which includes households that have respectively migrated within Kagera and outside the region of Kagera between 1991 and 2004.

particularly strong in refugee-hosting areas (–14 percent compared with –8 percent in other areas). The poor in refugee-hosting areas also appear to have performed relatively well in these areas. Such pro-poor development seems to have gone along with a structural transformation in the refugee-hosting areas.[6] A more pronounced shift in income generation and occupations from agricultural to nonagricultural activities is observed in refugee-hosting areas. One may therefore conclude that such structural transformation has led to poverty reduction. However, beyond the issue of causality, which will be discussed in the next section, the income structure of the poor has not necessarily followed such a structural shift. On the contrary, this descriptive analysis suggests that agriculture may still play an important role in poverty reduction in a refugee-hosting economy that has experienced a process of structural transformation.

Table 2.l—Descriptive statistics

		All	Refugee-Hosting Areas			Other Areas		
		Mean	1991	2004	Change	1991	2004	Change
Real consumption (PAE, TSh)	All	235,292	180,574	273,082	92,508	200,483	287,052	86,569
	Poor	83,422	82,677	85,709	3,032	83,242	83,172	–70
Below poverty line (share)	All	0.17	0.25	0.11	–0.14	20	0.11	–0.08
Agricultural income (share)	All	0.83	0.92	0.82	–0.10	0.81	0.77	–0.04
	Poor	0.95	0.97	0.94	–0.02	0.97	0.89	–0.08
Nonagricultural income (share)	All	0.11	0.05	0.13	0.08	0.12	0.17	0.05
	Poor	0.04	0.02	0.05	0.03	0.02	0.11	0.09
Main occupation in agriculture (share)	All	0.75	0.87	0.79	–0.09	0.74	0.72	–0.02
	Poor	0.91	0.95	0.91	–0.03	0.89	0.86	–0.03
Main occupation in nonagriculture (share)	All	0.38	0.24	0.38	0.14	0.45	0.45	0.00
	Poor	0.17	0.12	0.16	0.04	0.22	0.24	0.02

Source: Author's calculation based on the Kagera Health and Development Survey (KHDS).
Note: Refugee-hosting areas are defined on the basis of the median value of our treatment variable (RI index). PAE means Per Adult Equivalent while Tsh expresses the monetary unit in Tanzanian Shillings.

Baseline Results

Table 2.2 presents the baseline results, based on specification (1) defined above. Regression (1) first confirms Maystadt and Verwimp's (2009) findings that on average the refugee presence had a positive impact on the standards of living of the hosting population, measured by the household real consumption per adult equivalent. However, this first regression does not meet the focus of this paper, that is, how the presence of refugees has affected the level of poverty in refugee-hosting areas. The remaining regressions of Table 2.2 provide the results for the household probability to be below the poverty line in columns (2) and (3), the headcount index in (4) and (5), the poverty gap index in (6) and (7), and the squared poverty gap index in (8) and (9). Regressions (10) and (11) use the real consumption per adult equivalent, while introducing as an explanatory variable the interaction term between the refugee presence and the initial poverty status (defined in 1991).[7] Doubling the presence of refugees increases the probability of getting out of poverty by about 11 percent in regression (3). This is quite a tremendous increase in welfare. These baseline results are robust to the choice of poverty measure, but the size of the coefficient of interest decreases with capturing the depth of poverty (or inequality among the poor).

[6]Structural transformation designates the "mechanism by which underdeveloped economies transform their domestic economic structures from an heavy emphasis on traditional subsistence agriculture to a more modern, more urbanized and more industrially diverse manufacturing and service economy" (Smith and Todaro 2009, 115).

[7] The results of regressions (2) and (3) are robust to the use of a nonlinear model, in particular, a fixed-effects logit model. The baseline results are also robust to the addition of time-varying proxies for trade flows with neighboring countries that will be used and described in Section 3.

Table 2.2—Baseline results

Dependent Variables	(1) Log($V_{h,t}$)	(2) PS	(3) PS	(4) HCI	(5) HCI	(6) PGI	(7) PGI	(8) SPGI	(9) SPGI	(10) Log($V_{h,v,t}$)	(11) Log($V_{h,v,t}$)
Log(RI)	0.0822*	–0.068	–0.108**	–0.048	–0.074*	–0.024	–0.029*	–0.014	–0.016*	–0.151***	–0.0691*
	(0.0478)	(0.0442)	(0.0497)	(0.036)	(0.042)	(0.015)	(0.017)	(0.008)	(0.009)	(0.0382)	(0.0405)
Log(RI)										0.0781***	0.0761***
**PS$_{h,1991}$*										(0.00667)	(0.00556)
Age	–0.00354***		0.00267***								–0.00249**
of head	(0.00106)		(0.000874)								(0.000969)
Literacy of	–0.00673		0.00456								–0.00559
head	(0.00459)		(0.00392)								(0.00494)
Female	0.0839		0.0472								0.106
married	(0.146)		(0.126)								(0.11)
Female	–0.181***		0.0692*								–0.172
unmarried	(0.0483)		(0.0366)								(0.0381)
Male	–0.00288		0.0425								0.0036
unmarried	(0.0514)		(0.0407)								(0.0474)
Split-off	0.0607		–0.0536*								0.0266
	(0.0371)		(0.029)								(0.0315)
Proportion of	0.340***		–0.0929*								0.320***
Literate	(0.0762)		(0.0495)								(0.0708)
Log(Adults)	–0.220***		0.0246								–0.234***
	(0.0375)		(0.03)								(0.0333)
Natural	–0.0812*		0.045		0.036		0.0032		0.0013		–0.0558
disaster	(0.0472)		(0.0341)		(0.0315)		(0.0124)		(0.006)		(0.0403)
Crop	0.0783		–0.113**		–0.091**		–0.0194*		0.0056		0.0338
disaster	(0.0544)		(0.0427)		(0.042)		(0.0105)		(0.0046)		(0.0529)
Epidemic	–0.0117		–0.0564**		–0.047*		–0.016**		–0.0058		–0.0619
disaster	(0.0403)		(0.0266)		(0.024)		(0.008)		(0.004)		(0.0395)
Rainy day	0.00699**		–0.00424**		–0.0042**		–0.0012**		–0.00047**		0.00628**
(5-year average)	(0.00288)		(0.00208)		(0.0441)		(0.0267)		(0.0409)		(0.0025)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes
Village FE	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Observations	3,291	3,308	3,291	102	102	102	102	102	102	3,308	3,291

R^2	0.278	0.05	0.101	0.335	0.496	0.308	0.442	0.289	0.379	0.311	0.395

Source: Author's estimations.

Note: *** p< 0.01, ** p< 0.05, * p< 0.1. Robust standard errors are clustered at the village level in parentheses. Log($V_{h,t}$), PS, HCI, PGI, and SPGI stand for, respectively, the real consumption per adult equivalent (transformed into logarithm), the poverty status of the household, the headcount index, the poverty gap index, and the squared poverty gap. Log(RI) is the logarithm transformation of the refugee index defined in Section 2. FE means fixed effects.

The baseline results indicate that the refugee presence has had a pro-poor impact on real consumption per adult equivalent. While doubling the refugee inflows on average increases real consumption by 8 percent, the probability of getting out of poverty increases too, by about 11 percent. As a point of comparison, Beegle, De Weerdt, and Dercon (2011) found that migration increases real consumption by about 37.8 percent when the endogenous nature of the migration decision is dealt with. Of course, comparison with this paper should be with caution because the two papers are not talking about the same category of migrants. Beegle, De Weerdt, and Dercon (2011) consider economic migrants (dealing with endogeneity), but this analysis deals with politically motivated migrants or refugees. However, the baseline results indicate that migration benefits not only the migrants themselves and possibly their relatives (Beegle, De Weerdt, and Dercon 2011) but also the places of destination.

It is important to note that refugees in the region of Kagera were competing in the low-skilled segment of the labor markets, explaining why Maystadt and Verwimp (2009) found a negative impact for the households initially involved into agricultural labor. Therefore, the positive impact on both real consumption and poverty may be seen as contrasting the classical theoretical predictions of a decreasing impact on the welfare of the initially poor people, more likely to compete directly with the refugees on the labor markets. However, this would hold only under peculiar assumptions. First, this would hold under the assumption that refugees and initially poor households are perfect substitutes. In the region of Kagera, this may be the case for the few agricultural workers, but most households own land and were able to increase agricultural production by using this cheap labor force. Second, the classical prediction is jeopardized when changes in wages are at least partly compensated by changes in the sectoral allocation of working time. This will be discussed in the next section. Third, it is important to consider that migrants, including refugees, move with their demand (partly induced by humanitarian aid), increasing the size of the market for agricultural and nonagricultural products. Such increase may well call for additional output in the agricultural and nonagricultural sectors and increase the labor demand for workers. This is what Friedberg (2001) calls the *scale effect* and Ottaviano and Peri (2011) the *fallacy of partial effects*. In the context of Kagera, this scale effect may have been possible given the availability of land, allowing for land expansion and the surge in agricultural production, but this needs to be discussed against other possible supply constraints. This will be the case at the end of Section 3. Before the pathways out of poverty are investigated, the following paragraphs assess the ability to give a causal interpretation to these baseline results.

Identifying Assumptions

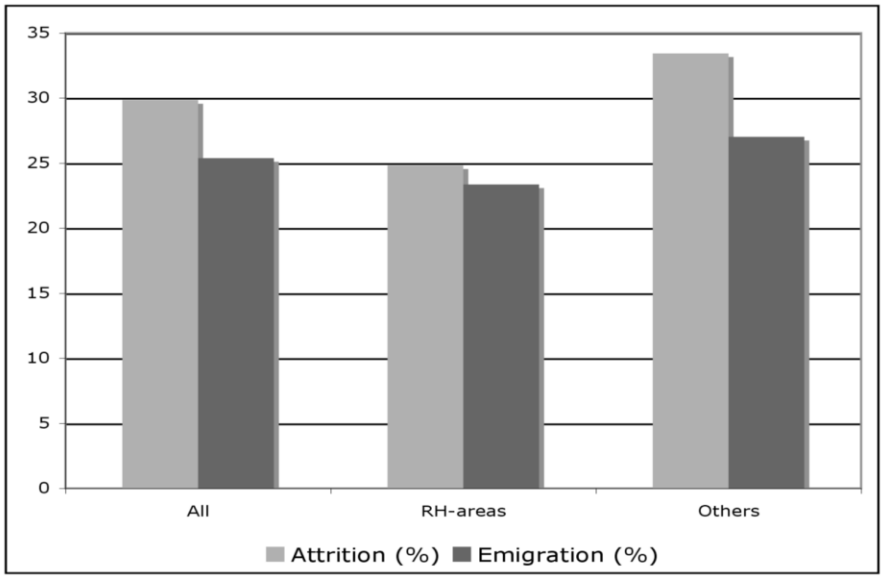
The baseline results are based on three main identifying assumptions. First, a possible attrition problem may be a source of concern in case the potential loss of survey respondents before and after the refugees arrived is different between our control and treatment groups. Second, the refugee presence is assumed to be exogenous to unobserved characteristics at the village level. Third, given the use of traced households between 1991 and 2004, households located in villages close to refugee camps are assumed to follow a similar trajectory in terms of real consumption and poverty reduction as other households in absence of refugees. The next three subsections assess the validity of these assumptions, like Maystadt and Verwimp (2009).

Attrition: Role of Migration

The consequences of attrition may be easily figured out through a hypothetical experiment. We could imagine a catastrophic scenario. Assume, for example, that households die or leave the region in a higher proportion in refugee-hosting areas compared with others. Finding an average positive effect on real consumption and poverty reduction could simply mean that those who remain in the sample are better able to adjust and more likely to make a living from the nonagricultural sector compared with those who drop from the sample. Given the fact that we keep in our sample only the households that have been interviewed in both 1991 and 2004, an attrition problem could bias the results. Nevertheless, we can unambiguously reject the catastrophic view, following which people would massively die or escape the refugee-hosting areas. Figure 2.2 shows that contrary to the commonly held beliefs that refugees burden their hosts, the

establishment of a refugee camp neither prompted host people to drop out of the sample (due to untraced migration or death) between 1991 and 2004 nor gave them incentive to migrate (traced) from their home village.

Figure 2.2—Attrition and emigration rates



Source: Author's calculation based on the Kagera Health and Development Survey (KHDS).
Note: RH indicates the group of refugee-hosting areas based on the median value of our treatment variable (RI index).

Migration may still be a source of concern for our identification strategy. Due to migration, the empirical strategy may identify an impact of an (unintentionally) selected population, reducing the ability to generalize the results beyond the groups of interest. Labor economists such as Hatton and Tani (2005) and Card (2001) show that the estimate of the impact of migrants on the receiving economies may be biased downward, when possible native displacements are neglected. Furthermore, de Janvry and Sadoulet (2009) show that this concern is particularly relevant for assessing the determinants of poverty reduction. Assume that poor households are more likely to migrate out of refugee-hosting areas. In that case, migration may be a confounding factor for poverty reduction through a selection process. The poverty-reducing impact of the refugee presence may then reflect that the poor are also more likely to leave the affected areas and those remaining are likely to be able to adjust to such a shock. However, migration is found to be poverty neutral in the present study. Table 2.3 presents regressions of the probability to migrate on the same explanatory variables used in Table 2.2 and defined in 1991. Two migration decisions are considered: migration to a neighboring village within the region of Kagera, and migration outside the region of Kagera. Regressions (1) to (3) of Table 2.3 include the former form of migration, while regressions (4) to (6) include both. Regression (1) of Table 2.3 indicates that the presence of refugees has no impact on the probability to migrate within the region of Kagera. On the contrary, regression (4) confirms Maystadt and Verwimp's (2009) results that the probability to migrate decreases in refugee-hosting areas. More importantly for the focus of this study, the migration patterns are not different in refugee-hosting areas compared with our control villages. The initial poverty status is indeed added in regressions (2), (3), and (6) of Table 2.3 and is interacted with the refugee index in regressions (3) and (6). To sum up, Table 2.3 supports the assumption of a poverty-neutral migration.[8]

[8] More evidence for poverty neutrality is the fact that our coefficients keep similar size and levels of significance when migrants are included in the baseline analysis. The probability of moving out of poverty would increase by about 10 percent following a surge of 100 percent in the refugee presence. Including the migrants also allows for the introduction of time-varying village dummies that would capture the characteristics of the locations where people move to. Results are very similar to our baseline results. These results are available on request.

Table 2.3—Probability to migrate

Dependent Variables	(1) Prob(M_k)	(2) Prob(M_k)	(3) Prob(M_k)	(4) *Prob*(M_{all})	(5) *Prob*(M_{all})	(6) *Prob*(M_{all})
Log(RI)	–0.151	–0.160	–0.106	–0.215*	–0.215*	–0.185
	(0.103)	(0.104)	(0.122)	(0.121)	(0.118)	(0.138)
$P_{h,1991}$		0.081	1.276		–0.00725	0.677
		(0.084)	(1.582)		(0.0954)	(1.378)
Log(RI)			–0.135			–0.0771
*$P_{h,1991}$			(0.178)			(0.153)
$Z_{h,1991}$	Yes	Yes	Yes	Yes	Yes	Yes
$Q_{v,1991}$	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,442	2,442	2,442	2,759	2,759	2,759

Source: Author's estimations.

Note: * p< *0.1*. Robust standard errors are clustered at the village level in parentheses. Prob(M_k) and Prob(M_{all}) stand for, respectively, the probability to migrate to another village within the region of Kagera and the probability to migrate either within or outside the region of Kagera. Log(RI) is the logarithm transformation of the refugee index defined in Section 2.

Is the Establishment of Refugee Camps Exogenous?

The identification strategy rests on the exogenous nature of the refugee presence. For a long time, labor economists have pointed to the risk of downward bias in assessing the impact of migration on receiving economies, when migrants are able to choose areas that are more economically dynamic (that is, where economic well-being is expected to be larger) with the hope of finding a job. As far as refugees in Kagera are concerned, very little of the location decision was in their hands. In the words of Friedberg and Hunt (1995), the use of a natural experiment—that is, episodes where the timing and location of (forced) migration may be politically rather than economically motivated—reduces the problem of location choice based on economic conditions (Card 2001; Friedberg 2001; Hunt 1992). Still, a legitimate concern might be that the location of the camps could be linked to unobserved village characteristics. In that case, any association between the number of refugees and the level of poverty of domestic inhabitants would likely be driven by the underlying correlation between the level of development of the host regions and this outcome rather than by the causal effect of the exposure to refugees. Nevertheless, qualitative and quantitative evidence suggests that endogeneity is a minor concern in our case and that any endogenous bias would reduce our results to lower-bound estimates.

Controlling the border was not at all something in the hands of the local authorities. The refugee inflow was so massive that, at the time, it was a security issue more than anything, and borders were enforced by the military. The choice of location was mainly made by the Ministry of Home Affairs and UNHCR. Among the main criteria reported to have been used was an important cost issue. The influx of refugees was so sudden and so massive that it was too costly to move them far away from the border. Therefore, contrary to the UNHCR *Handbook for Emergencies* guidelines, refugee camps were located quite close to the border. So, if there was a choice of location to be made, this choice was restricted to the area close to the border. In addition, as confirmed by officials, this was reinforced by the willingness of the Tanzanian government to ease the repatriation process and reduce as quickly as possible the risk of a small Rwandan or Burundian conflict within the Tanzanian borders. Such geographic restrictions on the choice of location certainly reduce the endogeneity problem.

Still, we can make an educated guess as to the likely sign of any bias in case of endogenous location. Table 2.4 presents regressions of the refugee presence on the explanatory variables and the various dependent variables of the baseline regressions, all defined in 1991—that is, before the refugees arrived. All these results indicate that the refugee presence was negatively and significantly associated with the initial

level of development. According to regression (1), the initial real consumption per capita was significantly lower in refugee-hosting areas compared with other areas, while the initial levels of poverty (measured in four different ways) are found to be significantly and relatively higher in refugee-hosting areas. Similar results are obtained where the same exercise is replicated, restricting the sample to households who live in the two border areas, that is, the districts of Kagera and Ngara. It is therefore difficult to argue that refugees chose the best locations for themselves from an economic point of view and that the baseline results would be biased upward. On the contrary, in the case of an unlikely endogenous choice of location, these results would then represent a lower bound of the true impact.

Table 2.4—Is the establishment of refugee camps exogenous?

Dependent Variable	(1) Log(RI)	(2) Log(RI)	(3) Log(RI)	(4) Log(RI)	(5) Log(RI)
Log($V_{h,v,1991}$)	–0.116**				
	(0.0572)				
PS_{h1991}		0.171*			
		(0.088)			
$HI_{h,1991}$			0.653		
			(0.568)		
$PGI_{h,1991}$				3.445***	
				(1.213)	
$SPGI_{h,1991}$					8.774**
					(3.099)
$Z_{h,1991}$	Yes	Yes	Yes	Yes	Yes
$Q_{v,1991}$	Yes	Yes	Yes	Yes	Yes
Observations	1,651	1,651	51	51	51
R^2	0.231	0.236	0.401	0.446	0.491

Source: Author's estimation.
Note: *** p< *0.01,* ** p< *0.05,* * p< *0.1.* Robust standard errors are clustered at the village level in parentheses. Log(RI), $Log(V_{h,v,1991})$, PS, HCI, PGI, and SPG stand for, respectively, the refugee index, the real consumption per adult equivalent (transformed into logarithm), the poverty status of the household, the headcount index, the poverty gap index, and the squared poverty gap.

Common Trends Assumption

Working with traced households over time, our identification strategy rests on the assumption that households located in villages close to refugee camps would follow a similar trajectory in the absence of refugees, in terms of real consumption per adult equivalent and of poverty, as households living in far-away villages (not exposed to refugee presence). To assess this fundamental assumption, we construct the same variables for an additional pre-refugee year (that is, before October 21, 1993). It is then assessed whether, in the absence of refugees, all households and villages are likely to follow parallel paths over time in terms of poverty. Finding a significant coefficient would suggest that households mostly exposed to the refugee presence (the treatment group) would be on a different trend, even before the refugees arrived. Table 2.5 presents the results of such a *placebo* test, seeking to see whether differences of real consumption and poverty could be explained by the refugee presence when refugees were not yet present. Based on a sample followed between 1991 and 1993, Table 2.5 suggests that the positive effect of the refugee presence on real consumption per adult equivalent cannot be explained by changes occurring before the refugees arrived. For the alternative poverty measures, a diverging trend is found before the refugees arrived, suggesting that refugee-hosting areas were on an upward trend in terms of poverty before the refugees arrived. Consequently, the baseline results should be seen as lower-bound estimates.

Table 2.5—Testing the common trend assumption

Dependent Variables	(1) Log($V_{h,t}$)	(2) PS	(3) HCI	(4) PGI	(5) SPGI
Placebo	0.00662	0.131***	0.132**	0.0734**	0.0402**
	(0.0615)	(0.0485)	(0.0646)	(0.0308)	(0.0168)
$Z_{h,1991}$	Yes	Yes	Yes	Yes	Yes
$Q_{v,1991}$	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	No	No	No
Village FE	No	No	Yes	Yes	Yes
Observations	1,696	1,696	74	74	74
R^2	0.683	0.388	0.822	0.8	0.79

Source: Author's results based on the Kagera Health and Development Survey (KHDS).

Note: *** p< *0.01,* ** p< *0.05,* * p< *0.1.* Robust standard errors are clustered at the village level in parentheses. Log($V_{h,t}$), PS, HCI, PGI and SPGI stand for, respectively, the real consumption per adult equivalent (transformed into logarithm), the poverty status of the household, the headcount index, the poverty gap index, and the squared poverty gap. FE means Fixed Effect.

3. Pathways Out of Poverty

The next step is to shed light on the main drivers of poverty reduction. The analysis can indeed exploit the exogenous variation of refugee inflows to identify the contribution of the agricultural and nonagricultural sectors to poverty reduction. We follow Christiaensen, Pan, and Wang (2010) in adapting Ravallion and Datt's (1996) method to a sample of households followed over time.

The average household income (Y_h) is assumed to be the sum of the income generated from the agricultural sector (*A*) and the nonagricultural sector (*NA*). Y_i and u_i denote, respectively, the income and the number of hours generated and spent by each household from and to each sector i = A, *NA*.[9] The average household income can be decomposed as follows: $Y = n_A Y_A + n_{NA} Y_{NA}$.

By decomposing the sectoral contribution to poverty reduction, like in Ravallion and Chen (1996), the following expression is obtained: $dln(P) = s_A\, dln(Y_A) + s_{NA}\, dln(Y_{NA}) + n_{NA} \frac{Y_{NA} - Y_A}{Y}\, dln(n_{NA})$, where $s_i = n_i \frac{Y_i}{Y}$, that is, the sectoral share of total household income. The following regression can be then estimated as a test of the sectoral contribution to poverty changes:

$$
\begin{aligned}
dln(P)_{h,t} = \\
&\gamma_1 s_{h,A,1991}\, dln\left(Y_{h,A,t}\left(X_{h,t}, Z_{A,t}\right)\right) + \gamma_2 s_{h,NA,1991}\, dln\left(Y_{h,NA,t}\left(X_{h,t}, Z_{NA,t}\right)\right) + \\
&\gamma_3\, n_{h,NA,1991} \frac{Y_{h,NA,1991} - Y_{h,A,1991}}{Y_{h,1991}}\, dln\left(n_{h,NA,t}\right) + \gamma_4\, X_{h,t} + \gamma_5\, Q_{v,t} + \alpha_h + \\
&\alpha_t + \varepsilon_{h,t} \qquad (2)
\end{aligned}
$$

Similar to that in Ravallion and Datt (1996), the first and second terms provide the contribution of changes in sectoral labor productivity on poverty, and the third term measures the impact of the shift in labor–time allocation to nonagricultural occupations. Adapting Ravallion and Datt (1996) to a two-period framework requires finding exogenous variation in Z_A and Z_{NA}. Following Section 2, the exogenous inflows of refugees may be used as a possible instrument for agricultural labor productivity. The regressions presented in Table 2.2 can then be seen as the reduced-form equation of a two-stage estimation. Regarding nonagricultural labor productivity, trade connection with neighboring countries is used as an additional instrument because it constitutes a major determinant of nonagricultural productivity growth (McMillan and Rodrik 2011). Such exogenous variation in trade integration is constructed by taking the changes in trade between Tanzania and neighboring Uganda, weighted by the distance between each village and the Ugandan border.[10] The first-stage regressions in (1), (2), (4), and (5) of Table 3.1 confirm that the presence of refugees largely explains the agricultural labor productivity, while the proxy for trade integration significantly affects the nonagricultural labor productivity. Poverty elasticities of the instrumented measures of agricultural and nonagricultural labor productivity are then estimated in the second stage. Regressions (3) and (6) of Table 3.1 indicate that agricultural labor productivity has been a major pathway out of poverty in refugee-hosting areas. In this framework, the elasticity of the sectoral labor productivity on poverty can be obtained by multiplying the estimated coefficient by the sectoral share of income (0.92 for agriculture). The coefficient of about –0.30 corresponds to an elasticity of the agricultural labor productivity on poverty of about –0.28. In other words, doubling agricultural labor productivity would reduce poverty by about one-third. In a region where about 29 percent of the population is recognized as poor according to the commonly used poverty line (Beegle, De Weerdt, and Dercon 2011), increasing agricultural labor productivity constitutes an interesting pathway out of poverty.

[9] Christiaensen, Pan, and Wang (2010) also propose to quantify the contribution of other income sources such as the ones from rural–urban migration or transfers. Such extension is outside the scope of this analysis.

[10] The addition of the same proxy for Burundi and Rwanda does not change our results.

Table 3.1—Contribution of sectoral labor productivity to poverty changes

	(1)	(2)	(3)	(4)	(5)	(6)
STAGE	1st	1st	2nd	1st	1st	2nd
Dependent Variables	$s_{h,A,\ 1991}^{*}$ $\ln(Y_{h,A,t})$	$s_{h,N\ A,1991}^{*}$ $\ln(Y_{h,N\ A,t})$	Poverty Status	$s_{h,A,\ 1991}^{*}$ $\ln(Y_{h,A,t})$	$s_{h,N\ A,1991}^{*}$ $\ln(Y_{h,NA,t})$	Poverty Status
$s_{h,A,\ 1991}^{*}$ $\ln(Y_{h,A,t})$			–0.281** (0.121)			–0.306** (0.13)
$s_{h,N\ A,1991}^{*}$ $\ln\{Y_{h,NA,t})$			0.00809 (0.020)			0.021 (0.022)
$n_{h,N\ A,1991}^{*}$ $\frac{Y_{h,NA,1991}-Y_{h,A,1991}}{Y_{h,1991}}$ $*ln(n_{h,NA,t})$						6.08 E-06 (4.64e-06)
Log(RI)	0.440**	1.845***		0.440**	1.845***	
	(0.171)	(0.43)		(0.171)	(0.437)	
Trade flows	0.0348	–27.72***		0.0348	–27.72***	
to Uganda	(1.793)	(4.216)		(1.793)	(4.216)	
$Z_{h,t}$	Yes	Yes	Yes	Yes	Yes	Yes
$Q_{v,t}$	Yes	Yes	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes
Household Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Underidentification test			1.233			1.169
(P-Value)			(0.267)			(0.2797)
F-test on	3.44**	29.41***		4.63**	30.49***	
excluded instruments						
Observations	3,108	3,108	3,108	3,108	3,108	3,078

Source: Author's estimation.
Note: *** p< 0.01, ** p< 0.05, * p< 0.1. Robust standard errors are clustered at the village level in parentheses. Log(RI) is the logarithm transformation of the refugee index defined in Section 2.

Exploiting the exogenous variation provided by the refugee inflows also helps to decorticate the possible channels leading to that pathway. This also follows the discussion launched at the end of Section 2. How can we explain the pro-poor development in refugee-hosting areas, driven by improved agricultural labor productivity? First, the inflow of refugees has been associated with a sharp increase in market size. Increased demand for agricultural products stems from the fact that refugees exchanged a large share of what they received from the World Food Programme outside of the camps. The increase in demand was

further nurtured by the arrival of international workers with much greater purchasing power. The surge in demand is likely to foster commercialization of subsistence agriculture. As quantitative evidence of such a channel, Table 3.2 investigates with a maximum likelihood estimation (fixed-effects logit) the role of the refugee presence on the probability to enter market-based occupations. In particular, the question is whether a specific transition from subsistence agriculture can be observed in refugee-hosting areas, by interacting the presence of refugees with a dummy indicating whether a household was initially mainly involved in subsistence agriculture. According to regressions (1), (3), and (5), the presence of refugees significantly affects the probability of entering into nonagricultural activities and exiting the agricultural labor occupation. The exit from agricultural labor is consistent with Maystadt and Verwimp (2009), identifying agricultural labor as the occupation most affected by fiercer competition on the labor markets. But regressions (2), (4), (6), and (7) of Table 3.2 clearly identified a stronger transition from subsistence agriculture to market-based agriculture and nonagricultural occupations in refugee-hosting areas compared with other areas. The descriptive statistics provided in Table 2.1 were not sufficient to identify this particular transition. Such a commercialization was made possible by the relative availability of land in the region of Kagera. The increase in demand and the integration of this new inflow of labor was indeed associated with land expansion. Regression (8) of Table 3.2 confirms that the amount of land owned by each household increases by about 8 percent when the presence of refugees doubles.

Table 3.2—Occupational mobility

	(1)	(2)	(3)	(4)
	FE Logit	FE Logit	FE Logit	FE Logit
Dependent Variable	Agricultural market	Agricultural market	Nonagricultural market	Nonagricultural market
Log(RI)	0.2	0.177	0.502**	0.353
	(0.176)	(0.177)	(0.198)	(0.228)
$Subsistence_{1991}$		0.0362*		0.284***
**Log(RI)*		(0.0206)		(0.0242)
$Z_{h,\ 1991}$	Yes	Yes	Yes	Yes
$Q_{v,1991}$	Yes	Yes	Yes	Yes
Obs.	1,188	1,188	1,388	1,388
	(5)	(6)	(7)	(8)
	FE Logit	FE Logit	HHFE	HHFE
Dependent Variable	Agricultural labor	Agricultural labor	Nonagricultural business	Owned land
Log(RI)	–1 117***	–1.258***	0.876***	0.0769***
	(0.301)	(0.316)	(0.295)	(0.0246)
$Subsistence_{1991}$		0.241***	0.207***	
*Log(RI)		(0.0382)	(0.0248)	
$Z_{h,\ 1991}$	Yes	Yes	Yes	Yes
$Q_{v,\ 1991}$	Yes	Yes	Yes	Yes
Obs.	530	530	1,194	3,428

Source: Author's estimations.

Note: *** p< 0.01, ** p< 0.05, * p< 0.1;. Robust standard errors are in parentheses. Log(RI) is the logarithm transformation of the refugee index defined in Section 2. FE means Fixed Effects.

The analysis does not find any significant effect of changes in nonagricultural labor productivity on poverty reduction. However, this does not mean that nonagricultural development could not indirectly affect poverty through linkages with the agricultural sector. It has indeed been recognized that when the nonagricultural sector contributes to a relatively small direct impact on poverty reduction, its indirect impact may be very large (de Janvry and Sadoulet 2009; Christiaensen, Demery, and Kuhl 2011). The first-stage regressions given in Table 3.1 indeed indicate that the presence of refugees has also had a strong

impact on nonagricultural labor productivity. This is consistent with the reported fiercer competition between existing businesses and new entrepreneurs in refugee-hosting areas. Furthermore, Table 3.2 also shows that households initially involved in subsistence agriculture were more likely to enter into market-based activities, including nonagricultural activities. Income diversification in refugee-hosting areas was therefore associated with a strong reduction in poverty. Table 3.3 further indicates that the share of income generated from the nonagricultural sector has not been affected on average by the refugee presence. However, according to regressions (3) and (4), the share of income generated from this sector has significantly increased for the poor in refugee-hosting areas as compared with other areas. Therefore, while no direct effect of nonagricultural labor productivity was found in this analysis, income diversification may have played an important pathway out of poverty, in line with other studies on the importance of nonfarm rural activities for poverty reduction through intersectoral linkages (Davis et al. 2010).

Table 3.3—Income diversification as a pathway out of poverty

	(1)	(2)	(3)	(4)
Dependent Variable	Share Income	Share Income	Share Income	Share Income
	Nonagricultural	Nonagricultural	Nonagricultural	Nonagricultural
Excluding	Labor		Labor	
Log(RI)	0.0145	0.0121	0.00177	–0.00273
	(0.0162)	(0.0201)	(0.0158)	(0.0202)
Log(RI)			0.00655***	0.00766***
$*P_{h,1991}$			(0.00227)	(0.00266)
Z_{h1991}	Yes	Yes	Yes	Yes
$Q_{v,1991}$	Yes	Yes	Yes	Yes
Time dummies	Yes	Yes	Yes	Yes
Household FE	Yes	Yes	Yes	Yes
Observations	3,371	3,371	3,371	3,371

Source: Author's estimations.
Note: *** p< 0.01. Robust standard errors are clustered at the village level. Log(RI) is the logarithm transformation of the refugee index defined in Section 2. FE means Fixed Effects.

Though this paper identifies the refugee inflows as a major pathway out of poverty through increased agricultural labor productivity, the external validity of the analysis needs to be discussed. First, the availability of land appears to have played a major role in absorbing such a population inflow. Second, the refugee inflows attracted many economic migrants from other regions of Tanzania, increasing further the demand for agricultural and nonagricultural goods. Finally, the refugee inflows may have gone along with an increased provision of local public goods and improved road infrastructure. Many interview respondents stressed not only the health services provided in the refugee camps and available to the local population but also the investment of the international organizations and nongovernmental organizations in health services in the surrounding villages. Outside the camps, huge investment in transport such as road networks has been undertaken by the United Nations High Commissioner for Refugees and World Food Programme. Such investment in infrastructure may have contributed to agricultural productivity and

eventually income diversification to constitute major pathways out of poverty (Fan, Hazell, and Thorat 2000; Haggblade, Hazell, and Reardon 2010).

4. Conclusion

As far as we know, this is one of the first papers investigating the consequences of migration in a developing country and in a rural setting. Not only does migration improve the standards of living of the migrants themselves and their relatives in their village of origin, but also, at least in the region of Kagera, forced migrants (refugees) have had a strong and positive impact on the standards of living of the hosting communities. Furthermore, the refugee inflows have led to a sharp decrease in poverty in an economy experiencing a process of structural transformation. Although doubling the refugee inflows on average increases real consumption by 8 percent, the probability of getting out of poverty also increases by about 11 percent. The pro-poor nature of this development is also found to be driven by improved agricultural labor productivity and possibly income diversification among the poor. The combined conditions that seem to have favored such a pro-poor outcome are the imperfect substitution between refugees and their local hosts, an increase in market size, and land availability. The role of health and transport infrastructure were certainly complementary to these market-based channels, but the relative importance of public policies would need to be further investigated.

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