Economic Life in a Refugee Camp*

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Abstract

We examine the economic aspects of life in three refugee camps in Rwanda taking into account the economic setting in the locality of each camp. We find that inside the refugee camps vibrant economies emerge that reflect the surrounding economies. In addition, we find that in kind aid is often sold at prices far below the market price and that refugees receiving aid in cash look more and more like the local host-country population in terms of consumption and welfare.

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"There is interest in observing the growth of economic institutions and customs in a brand new society…the essential interest lies in the universality and the spontaneity of this economic life…as a response to the immediate needs and circumstances."

R.A. Radford

1. Introduction

Every year the United Nations High Commission on Refugees (UNHCR) places thousands of people who are displaced by civil conflict or other catastrophes in camps scattered across the globe. The number of refugees accommodated by UNHCR reached an all-time record of 13 million in 2015 (UNHCR, 2015). The popular image of these camps is one of grim holding pens for individuals stripped of agency and passively dependent on distributed food aid to survive. According to a recent United Nations Development Programme (UNDP) report, "forcibly displaced persons have little opportunity for expanding livelihoods, and are usually faced with realities that deny them a dignified life and fulfilment of their capabilities (De Bruijn, 2009)."

The reality is more complex. The same report concludes that "living conditions of refugees vary across thematic areas and are strongly contextualized, depending on a complex of social, economic, political and attitudinal factors."

Refugee camps may be the closest observable approximation to what happens when many individuals with heterogeneous endowments of human capital and other resources are plopped down upon a hilltop and allowed to interact with each other and a host-country economy—if the country rules permit—given the often severe constraints refugees face. In other words, the genesis of an economy.

In this paper we analyze the economic life of three Congolese refugee camps in Rwanda and the impacts of refugees on the host-country economies surrounding each camp. None of these three camps existed prior to 1996; all were literally featureless hilltops surrounded by local host-country economies ranging from very simple to relatively complex. The camps were selected to represent different host-country economic contexts. Under Rwanda's rules, refugees are free to interact with the host-country economy; however, local Rwandans are restricted from entering the camps. The camp gate, therefore, creates an exogenous asymmetric separation between camp and host-country economy. The camps also differ with regard to their exposure to the major recent innovation in refugee assistance: replacement of food aid with cash transfers accessed

through cell phones. Two of the three camps now receive aid in cash; one switched to cash eighteen months prior to our study, and the other two months prior. The third camp still received aid in food at the time of the survey.

There is little information about refugees' economic lives prior to entering the camps, or of the structure of the surrounding host-country economy prior to the camps' creation. The refugee camp populations are small compared to those of the districts in which they are located. It is not clear how one would obtain a true baseline, beyond the knowledge that the camp site, itself, was devoid of population and an economy of any kind prior to the camp's recent creation by events that were largely exogenous to both the refugees and host-country economy.

In collaboration with the World Food Program, we carried out detailed economic surveys of a random sample of refugee households and a number of formal businesses (not likely to be picked up by the household sample) in each camp, as well as host-country households and businesses within a ten-kilometer radius of each camp. A ten-kilometer radius captures the main markets in which refugees transact. Given poor transportation infrastructure, refugees rarely engage directly with markets outside this radius.

Using the survey data, we test three hypotheses. First, placed on a hilltop and subject to a given set of camp aid institutions and host-country "rules of the game" (which in Rwanda's case are remarkably non-constraining), camp economies emerge. Second, the structure and vibrancy of these economies varies across institutional and local host-country economic settings, in predictable ways. Third, as refugees interact with host-country businesses, the impacts of food aid are transmitted out into the host-country economy, creating income multipliers. That is, each dollar of food aid increases total income in and around camps by more than a dollar.

The only study we know of that might be considered a precedent for this one is Richard A. Radford's (1945) narrative piece on life in a World War II prisoner of war camp. Radford writes: "After allowance has been made for abnormal circumstances, the social institutions, ideas and habits of groups in the outside world are to be found reflected in a Prisoner of War Camp." He describes a vibrant exchange economy within the camp, in which distributions of ration packages fuel trade, like within an Edgeworth box. Cigarettes serve as the numeraire currency, with the value of this currency dropping after each new ration distribution (i.e., there is cyclical price

inflation). Radford skillfully describes the breakdown of trade after exogenous rule changes and the eventual adaptation of the economy within the POW camp to evolving circumstances.

The most obvious economic feature differentiating the refugee camps we study from a POW camp is the severity of the rules imposed on the latter, in particular the potential integration of refugees with the local economy, through the exchange of goods and services. This essentially removes macroeconomics from our analysis, because the camp and host economies share a common currency. The freedom of movement and action afforded to refugees, and asymmetric integration of camps with local economies, create expanded opportunities and incentives for employment, production, and exchange. By limiting camp entry, refugee camp rules potentially create a "price band" and the potential for rent seeking by influential camp actors.

A second important difference with Radford's POW camp is liquidity. In the refugee camps we study, money (the Rwandan Franc) is actively used. And as a result of new technologies, money does not necessarily mean cash: in Gihembe and Nyabiheke camps, refugees receive cash transfers through m-VISA accounts on cell phones supplied by the United Nations World Food Program (WFP). Refugees can "cash out" or use their cell phones to purchase goods or services from authorized vendors, which include other refugees' businesses.

This paper ushers in a new research agenda on economic life in and around refugee camps in East Africa. Its goal is to characterize the demographics and income generating activities of three Congolese refugee camps in Rwanda, and to share our discovery that despite unusual and grim circumstances, economies form in refugee camps, involving vigorous exchange of goods and services within the camps as well as with the surrounding host economy.

The paper is organized as follows: Section 2 highlights some of the relevant literature that this paper builds upon. Section 3 introduces the three camps and the host-country economies surrounding them. The data suggest that the economic activities and incomes of refugees are shaped in important ways by the structures of the surrounding host-country economies. In section 4, following Radford's POW camp analogy of an Edgeworth box, we analyze the consumption patterns and market behavior of refugees in the in-kind and cash camps, including refugees' interactions with markets for food and other goods outside the camps. Exchange relationships with the host country substantially extend the boundaries of the Edgeworth Box. In Section 5, we

compare welfare outcomes in and around the three camps and econometrically measure the differences in welfare between the camps that have switched to cash and the camp that continues to employ in-kind transfers as the method of aid delivery. We find evidence that, in the Rwandan context, aid in cash significantly increases welfare in refugee households. The final section concludes and discusses future avenues of research.

2. The Impact of Aid on Displaced Populations

Our analysis of economic life in Congolese refugee camps in Rwanda defies the popular image of refugees as stripped of agency and passively dependent on distributed food aid to survive. We describe the structure and elaborate on the unexpected vibrancy of refugee economies and discuss how these economies vary across institutional and local host-country economic settings. We show that different aid-delivery mechanisms have varying impacts on the economic and welfare outcomes observed inside the camps.

This paper adds to the literature on refugee settlements and their relationship with host populations. Despite undergoing forced migration and often living in destitute conditions, there are indications that refugees have productive capacities and assets and impact host country economies (Maystadt and Verwimp, 2014; De Montclos and Kagwanja, 2000; and Werker, 2007). However, empirical evidence on the effects of refugees on host countries is scant. Some studies suggest that refugees have no significant impact on local economies (Landau, 2004). Others suggest heterogeneous impacts, with negative shocks more likely to affect poor host-country households (Whitaker, 2002). Alix-Garcia and Saah (2009) consider the impact of refugee camps on agricultural prices in Tanzania. They find positive effects on prices of some agricultural products and a decrease in the price of food distributed in-kind at refugee camps. Baez (2011) finds that the influx of refugees into Tanzania has long-term adverse effects on the health of host-country children.

A branch of literature indirectly related to this paper addresses the impacts of migration on host communities. Some studies in this literature employ rigorous identification strategies enabling researchers to make causal inferences. It is not clear how findings from migration-impact studies are applicable to understanding impacts of refugees; however, they may offer some insights into possible economic impacts of refugees in some host-country contexts. Altonji and Card (1991),

Clemens (2013), and Glitz (2012) find that immigration has little to no effect on local unemployment, and it may result in a slight decrease in unemployment due to the income multipliers it creates. There is some evidence that a large influx of immigrants increases unemployment among the less-skilled workforce and also decreases wages among certain populations (Card, 2001; and Smith, 2012). An obvious difference between migrants and refugees is that refugees' displacement is considered involuntary and temporary, whereas most migrants choose their destination and duration in the host economy, unless contracted specifically for temporary work. A second difference is that, in most migration studies, host countries are high-income nations, whereas the majority of refugees are hosted by less-developed countries (Chambers, 1986; and Maystadt and Verwimp, 2014).

Our paper also relates to the literature on differences in welfare and efficiency gains from alternative aid-delivery mechanisms, namely in-kind versus cash transfers. Recent debate regarding the design of aid programs in developing countries is discussed thoroughly in Grosh et al. (2008). Increasingly, aid in developing countries is distributed in cash form. This is justified on the grounds that it generates the largest welfare gains by allowing beneficiaries to choose how best to spend the added income (Blackorby and Donaldson, 1988). After the appropriate administrative structure is in place, which may be costly, cash-transfers are the easiest form of aid to administer, and they are also the most efficient. The second theorem of welfare economics shows that under certain assumptions, cash transfers result in less deadweight loss than other forms of aid (Currie and Gahvari, 2008). However, in closed economies where supply is unable to rise in tandem with demand, cash transfers may provoke an increase in prices, with adverse impacts on consumers (Basu, 1996; and Gentilini, 2007). Jacoby (1997) argues that in-kind transfers are difficult to administer, which creates inefficiencies and suboptimal outcomes. In-kind aid may be justified when prices are volatile (Coate, 1989); however, under some circumstances in-kind transfers may lower prices of distributed food items and adversely affect local production. Hidrobo et al. (2014), using a randomized control trial, find that in-kind transfers lead to higher caloric intake among beneficiaries than cash transfers, although they also conclude that in-kind transfers are less cost-effective.

For the most part, implications of different aid mechanisms have been analyzed through a partial equilibrium lens. But households are interconnected in local economies, and positive income

shocks are not limited to beneficiaries. The economy-wide general equilibrium impacts of programs have recently been given some space in the economics literature. Cash transfer programs have been shown to have significant multiplier effects in beneficiary households (Davies and Davey, 2008; Sadoulet, De Janvry, and Davis, 2001) and in local economies (Taylor, Kagin, et al., 2013).

3. Camp Settings and Refugee Economies

Currently, the WFP operates in five refugee camps in Rwanda. The three camps in this study were selected to represent different host-country economic contexts and food-distribution mechanisms. Gihembe, the oldest of the three , was founded shortly after the onset of the Congolese Civil Wars in 1998, followed by Nyabiheke (2006-2007) and Kigeme (2011). Two of the three camps now receive aid in monthly cash transfers; one (Gihembe) switched to cash eighteen months prior to our study, and the other (Nyabiheke) two months prior. The third camp (Kigeme) still receives aid in monthly food packets. The surveys, carried out in the summer of 2015, gathered data to carry out a study of how refugee camp economies interact with surrounding host-country economies and the local economic impacts of alternative food aid delivery mechanisms, specifically in-kind versus cash aid distribution.

The descriptive analysis that follows sketches a picture of three different host-country economies. Nyabiheke is an agricultural economy, with potential farm employment and the seasonality and low wages typically associated with farm work. The result is a high incidence of refugee employment in agriculture but relatively low wage income in Nyabiheke refugee households. With fewer host-country businesses nearby, Nyabiheke refugee households are more likely to have businesses inside the camp. At the other extreme, Gihembe is largely a non-farm economy, with the potential to provide more stable and higher-paying jobs. Gihembe refugees have the highest incidence of non-farm wage work and the highest average wage earnings per household. However, they also have the lowest wage-labor participation rate of all three camps, likely reflecting human capital constraints on obtaining non-farm jobs. Kigeme lies somewhat in between these two extremes. It offers fewer agricultural work opportunities than Nyabiheke, but less non-farm wage employment than Gihembe.

Socio-demographics

Table 1 shows that there are significant differences in socio-demographic characteristics between host-country (left panel) and refugee (right panel) populations, but not across camps. Host-country households average around 5 members. Most (69 to 75 percent) are male-headed. Household heads are slightly older in the area surrounding Nyabiheke, the most agricultural of the three camps. Average schooling of household heads barely exceeds 3 years around all three camps. School enrollment rates for host-country children are high, however (87 to 94 percent).

Refugee households are larger (5.4 to 5.6 members) than host-country households (4.7 to 5.1). Refugee household heads are nearly as likely to be female as male. They are younger and have less schooling on average than host-country heads, well below three years.

Low education potentially limits refugees' access to nonfarm jobs. However, young adults in older camps are likely to have had access to education at an early age and to have accumulated more years of education. Refugees 18 to 35 in Gihembe (the oldest of the camps) average 4.5 years of schooling, compared to 3.8 in Nyabiheke. Current enrollment rates for refugee children approach 100% in all three camps, thanks to UNHCR-run schools.

Table 1. Selected Socio-demographic Characteristics of Host-country and Refugee Households

	Host-Country Households			Refugee Households		
	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
Sample Size	243	180	162	224	166	155
Household Size	5.09	4.72	4.73	5.57	5.58	5.37
Household Head (Share Male)	0.73	0.69	0.75	0.53	0.52	0.49
Household Head Age	46.79	46.15	50.6	43.62	45.23	43.61
Average Years of Schooling						
Household Head	3.39	3.49	3.21	2.21	2.68	2.37
All - Ages 18-35	4.17	4.24	4.21	3.64	4.36	3.82
All - Ages 36-65	3.84	3.06	3.61	1.99	2.56	2.58
Enrollment Rates of Children 6-16 Years	0.94	0.87	0.87	0.96	0.97	0.98
# of Members Reported Sick in Last Month	1.28	1.4	1.78	1.13	1.11	1.51
Share Seeking Treatment	0.74	0.78	0.85	0.97	0.94	0.97
Share of Members Sleeping Under Mosquito Net	0.68	0.80	0.89	0.59	0.59	0.49

Refugees have better health outcomes and access to treatment than host-country households. They report a smaller number of members sick in the last month and are more likely to seek treatment if sick (Table 1; treatment is free inside the camps.) A smaller share of refugees sleep under a mosquito net, however. Refugee women are much more likely to consume supplements

during pregnancy and give baby food and supplements to their infants than their host-country counterparts (not shown).

Host-country Context and Employment

The host-country data around the three camps are drawn from five districts of Rwanda spanning a total of nineteen sectors. Section B of Appendix provides information about these sectors, including socio-demographic data and other district-level host-country statistics. Host-country economies differ around the three camps, and predictably, so do refugee employment outcomes (Table 2). Data on wage employment provide insight into the structure of host economies surrounding the camps (left panel). Host economies around the youngest and oldest camps (Kigeme and Gihembe) have the highest percentage of households with at least one person doing wage work in the 12 months prior to the survey (68 and 65 percent, respectively, compared to 50 percent around Nyabiheke). The share of males doing wage work significantly exceeds the share of females. Wage income is twice as high in Gihembe (77,141 RWF) than Kigeme (38,856), and it is significantly higher in both compared with Nyabiheke (24,265). A similar spread is evident in terms of households' per-capita wage income.

Table 2. Wage Employment and Income of Host-country and Refugee Households

	Host-Country Households			Refugee Households		
	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
Share of Households with Wage Worker in the Last 12 Months	0.68	0.65	0.5	0.42	0.34	0.47
Share of Females earning a wage	0.32	0.31	0.22	0.11	0.07	0.17
Share of Males earning a Wage	0.48	0.45	0.37	0.32	0.23	0.41
Total Household Wages*	38,856	77,131	24,265	20,466	24,830	24,386
Household Wages Per Capita*	7,589	14,774	5,573	4,889	5,483	4,493
Sector of Wage Work (Share)						
Agriculture	0.48	0.39	0.64	0.19	0.15	0.32
Government	0.08	0.12	0.03	0.01	0.03	0.02
NGO	0.02	0.05	0.03	0.44	0.21	0.27
Construction	0.14	0.17	0.19	0.25	0.14	0.22
Retail	0.03	0.05	0.02	0.01	0.17	0.06
Other Service	0.24	0.22	0.08	0.09	0.25	0.12
Location of Wage Work						
Inside Refugee Camp	0.01	0.00	0.00	0.68	0.35	0.43
In Local Economy	0.94	0.89	0.90	0.21	0.24	0.37
Outside	0.05	0.11	0.10	0.11	0.41	0.21

* US$1 = approximately 700 Rwandan Francs at the time of the survey

Participation in wage labor markets is lower for refugee than host-country households, but it is significant nonetheless (right panel of Table 2). The highest share of refugee households with wage income is in Nyabiheke (0.47), where wage-labor participation by host-country households is lowest. It is followed by Kigeme (0.42) and Gihembe (0.34), where host-country wage-labor participation is highest. As in the host-country population, female refugees have uniformly lower wage labor force participation rates (0.07 to 0.17) than males (0.23 to 0.41).

Table 2 also compares the sector distribution of host-country and refugee wage labor. The host-country economy around Nyabiheke Camp is largely agricultural, dominated by family farms, with little wage employment in government, retail, or services compared with the other two camps. The economies with the highest wage employment have the lowest shares in agriculture (.39 and .48) and the highest shares in government, retail, and other services. Gihembe, the least agricultural of the three economies, is also the most commercial in terms of wage employment share (.05 in retail). It has the highest shares in government (.12) and NGO work (.05). Its service share (0.22) is similar to Kigeme's (0.24) and considerably higher than Nyabiheke's (0.08).

Table 3 presents the basic structure of the agricultural and livestock production in the host economies. Ninety-two percent of host-country households around Nyabiheke participate in agriculture. Their average cultivated area was two to three times that around the other camps. Fifty-four percent of households sold crops—more than twice the percentage of households around the other two camps. Nearly one in four hired farm workers. A significantly larger share of households around Nyabiheke camp raised livestock (0.61, compared to 0.42 and 0.54 in Gihembe and Kigame, respectively; middle panel of Table 3). Participation in livestock markets is similar around the three camps; around 25 percent of households that raised livestock sold animals in the 12 months prior to the survey. However, total revenue from livestock sales was significantly higher around Gihembe than the other two camps. Livestock composition also differed across the three host-country economies (bottom panel of Table 3). Kigeme livestock producers specialize in cows and poultry, Gihembe in pigs, and Nyabiheke in poultry and goats.

Table 3. Agriculture and Livestock around the Three Camps

	Host-Country Households		
	Kigeme	Gihembe	Nyabiheke
Agriculture			
Household Participated in Ag	0.80	0.69	0.92
Sold Crops (If in Ag)	0.23	0.26	0.54
Hired Labor (If in Ag)	0.18	0.18	0.23
Cultivated Hectares (If in Ag)	0.22	0.35	0.63
Livestock			
Raised Livestock	0.54	0.42	0.61
Sold Livestock (If in Livestock)	0.25	0.28	0.25
Gross Sales (RWF)	70,303	93,731	68,540
Number of Animals	1.73	2.47	2.39
Livestock Composition			
Cows	0.31	0.53	0.36
Poultry	0.15	0.24	0.28
Pigs	0.45	0.08	0.06
Goats	0.09	0.16	0.29

Given the importance of agriculture in Nyabiheke, refugee workers there are significantly more likely to perform agricultural work than wage workers from the other two camps (middle panel of Table 2); nearly one-third of all Nyabiheke wage workers had farm jobs, while 81 to 85 percent of workers from the other two camps had nonfarm jobs. In this sense, the sectoral composition for refugee wage workers reflects that of host-country workers, and there appears to be a complementarity between host-country family farming and refugee agricultural wage labor.

NGOs employ a large share of refugees: 0.21 to 0.44, compared to 0.02 to 0.05 for host-country workers. Among non-agricultural sectors, refugees are uniformly under-represented in government, and they are over-represented in construction and other services at two of the three study sites. A disproportionately large share of Gihembe workers are employed in retail.

Where refugees work varies from camp to camp. The camp economy employs more than two-thirds of all refugee wage workers in Kigeme and 35to 43 percent in the other two camps. The local economies outside the camps absorb an additional 21 to 37 percent. Refugees are more likely than host-country workers to travel outside the local economy for wage work, particularly in the more commercial Gihembe. The large majority of wage earners from host-country households work in the local economy, and almost none work in the refugee camps.

There is a strong host-country business presence around Kigeme and Gihembe camps (left panel of Table 4). Around one in five Kigeme and Gihembe households had a non-farm business during the 12 months prior to the survey. Business ownership was somewhat lower (14%) in the agricultural area around Nyabiheke. In terms of asset value, businesses were largest in Gihembe and smallest in Nyabiheke. Although Kigeme and Nyabiheke businesses were more likely to hire workers than businesses in Gihembe. Average reported monthly profit was predictably highest in Gihembe, and lowest in the agricultural Nyabiheke.

Table 4. Non-farm Businesses around and in the Three Camps

	Host-Country Households				Refugee Households			
	Overall	Kigeme	Gihembe	Nyabiheke	**Overall**	Kigeme	Gihembe	Nyabiheke
Non-farm Business		0.20	0.17	0.14		0.13	0.08	0.17
Hires Workers		0.17	0.03	0.13		0.03	0.07	0.00
Value of Business (RWF)		743,491	1,770,193	579,904		34,397	32,271	63,327
Average Monthly Profit		55,326	77,737	30,470		10,813	18,014	22,242
Type of Business								
Petty Trader	**0.29**	0.30	0.29	0.26	**0.41**	0.40	0.40	0.44
Retail	**0.18**	0.14	0.24	0.19	**0.09**	0.02	0.21	0.06
Food Service	**0.23**	0.26	0.15	0.29	**0.24**	0.23	0.29	0.22
Other (including non-food services)	**0.30**	0.30	0.32	0.27	**0.26**	0.36	0.11	0.28

Land constraints inside the camps preclude refugee households from self-employment in agriculture and livestock.[1] Nevertheless, refugee non-farm businesses inside the camps are common, particularly where there is less presence of host-country businesses in the camps' vicinity. The right panel of Table 4 shows that between 8 and 17 percent of all refugee households operate a non-farm business of some kind. The highest incidence is in Nyabiheke, the camp with the smallest incidence of host-country businesses around it. Most refugee businesses are run out of homes, though a few more formal businesses are evident on the main street inside each camp. These are family operations, with little or no hired labor, and they are much smaller in reported value than host-country businesses.

Refugee businesses inside the camps benefit from access to inexpensive food and other merchandise as well as from the asymmetric movement of people between the camp and surrounding economy. Fewer host-country businesses near the camp implies higher transaction costs of buying food and other items for refugee households. This creates a price band: the price

[1] A negligible number of refugees rented land from host-country households outside the camp.

charged by camp businesses exceeds the host-country price by an amount up to the refugee consumers' per-unit cost of transacting with host-country businesses outside the camp. Thus, it is not surprising to find the highest incidence of refugee businesses in Nyabiheke, where a relatively small share of host-country households have businesses near the camp. In addition, businesses in Nyabiheke report the highest average profit. In Kigeme, the camp where refugees still receive aid in kind, the average reported profit of businesses owned by refugee households is approximately half that of the other two camps.

The four rows at the bottom of Table 4 decompose the types of non-farm businesses that host-country households and refugees are involved in. The numbers between the two are comparable, but overall, refugees are more likely to be petty traders, while host-country households are relatively more likely to be involved in retail, however, this is not true in Gihembe.

Besides food aid, wage employment in the host country, and businesses inside the camps, refugee households obtain income from remittances sent by family and friends outside the camp (Table 5). Refugees are understandably slightly more likely to receive remittances than host-country households in their locality. In addition, refugee households are much more likely to receive additional transfers, such as transfers from NGOs and the government. The share of refugee households receiving cash remittances ranged from 0.08 (Nyabiheke) to 0.20 (Gihembe), compared with 0.05 (Kigeme) to 0.09 (Gihembe and Nyabiheke) for host-country households. Some refugee households sent cash to households outside the camp. The share of out-remitters is small in the two most recent camps, Kigeme and Nyabiheke (0.02), but it is non-negligible in the more established camp, Gihembe (0.06).

Table 5. Shares of Refugee Households Receiving and Sending Cash Remittances

	Host-Country Households			Refugee Households		
Share of Households	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
Receiving Remittances	0.05	0.09	0.09	0.15	0.20	0.08
Sending Remittances	0.01	0.05	0.03	0.02	0.06	0.02
Receiving Other Transfers	0.20	0.17	0.09	0.50	0.30	0.37

Income and poverty vary around the three camps, in patterns that reflect the nexus of economic opportunities described above. Table 6 (top panel) shows that the average total and per-capita household incomes are highest around Gihembe and lowest around Kigeme. The headcount

poverty rate is highest around Kigeme and lowest around Nyabiheke, The poverty gap index is also highest around Kigeme, though similar in the areas surrounding the other two camps.

Average per-capita income is uniformly lower inside than outside camps, and it does not vary as much across camps as across host-country communities around the camps. Head-count poverty rates are significantly higher inside than outside the refugee camps. However, refugees receive free housing, healthcare, and education that are not reflected in these poverty measures. Thus, poverty differences might not accurately reflect welfare differences between refugee and host-country households.

We used the Alkire and Foster (2011) method to estimate a multi-dimensional poverty index based on the weighted deprivations that households face, then constructed a head count ratio that takes into account the severity of deprivation.[2] Based on this deprivation-adjusted poverty rate, the difference in poverty between refugee and host-country households is negligible for both cash camps. For the in-kind camp of Kigeme, however, the difference remains large, with refugee households much more likely to be poor and deprived.

Table 6. Household Income and Poverty around and in the Three Camps

	Host-Country Households			Refugee Households		
	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
Household Income Total (RWF)	63,433	93,304	77,223	47,222	52,427	49,215
Household Income Per-capita (RWF)	12,644	18,855	15,164	9,384	10,393	9,159
Poverty Head Count	0.605	0.556	0.531	0.755	0.729	0.725
Poverty Gap	0.329	0.297	0.296	0.207	0.215	0.214
Multi-Dimensional Poverty Adjusted Head Count	0.270	0.249	0.270	0.465	0.220	0.342

Combining income from wage work, camp businesses, and remittances, refugee households' total income substantially exceeds the aid they receive. The aid packages refugees receive are uniform on a per-capita basis. They amount to an average of 37,000 (Kigeme) to 41,000 (Gihembe) RWF.[3] WFP aid represents 76 to 78 percent of refugee households' total income in the three camps. Wages add another 14 to 16 percent; non-farm business profits, 2 to 4 percent; and remittances, 5 to 6 percent (Figure 1). Outside the camps, agriculture and wages comprise

[2] For more information on the variables used to construct our index see Appendix, Section B. For more information on the Alkire and Foster method and multi-dimensional poverty measures, see Alkire and Foster, 2011; Stoeffler et al., 2015; Bossert et al., 2013.

[3] We valued the Kigeme aid package at the value of cash transfers at the other two camps. We investigate the true implicit value of Kigeme aid packages below.

the bulk of host-country households' income, which on average exceede refugee total income. The relative importance of agriculture to the local economy of Nyabiheke is evident in Figure 1.

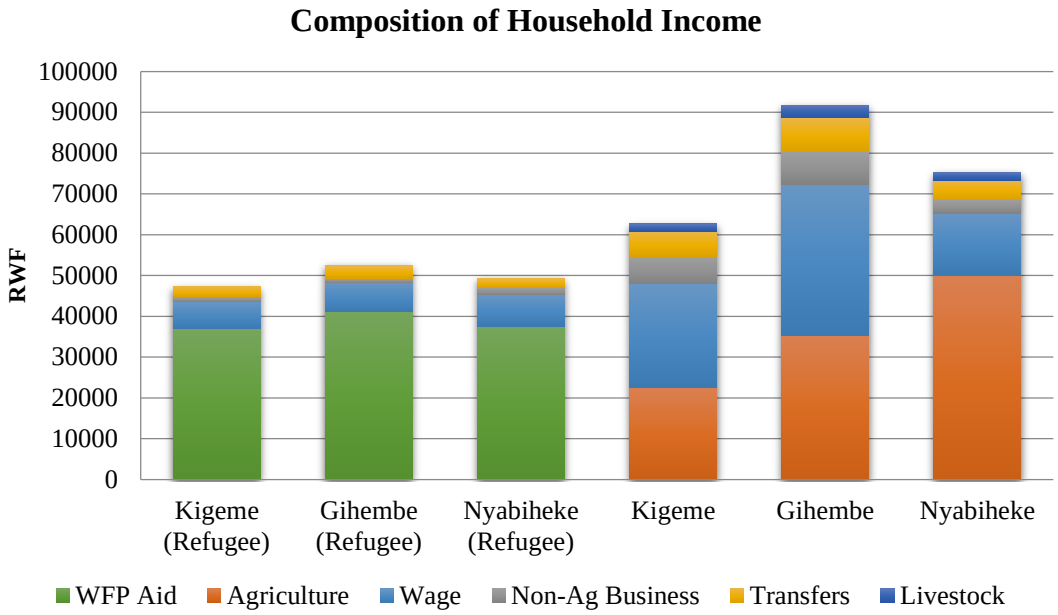

Figure 1. The composition of household income for refugee and local households in each location.

Figure 2 summarizes the distributions of refugee household income from aid and total income in each of the three camps. We constructed this figure for each camp by arranging refugee households from poorest to richest across the horizontal axis. Two findings stand out. First, even relatively poor households supplement their food aid with income from other sources. This is particularly true for the in-kind camp, Kigeme, where the total income and aid curves begin diverging from each other in the second income decile. Second, the income distribution is nevertheless unequal, with total income curves diverging sharply from the food-aid curves in the top income decile.

Although higher than the assistance refugees receive, refugee households' total incomes are significantly lower than host-country household incomes around the three camps. Total per-

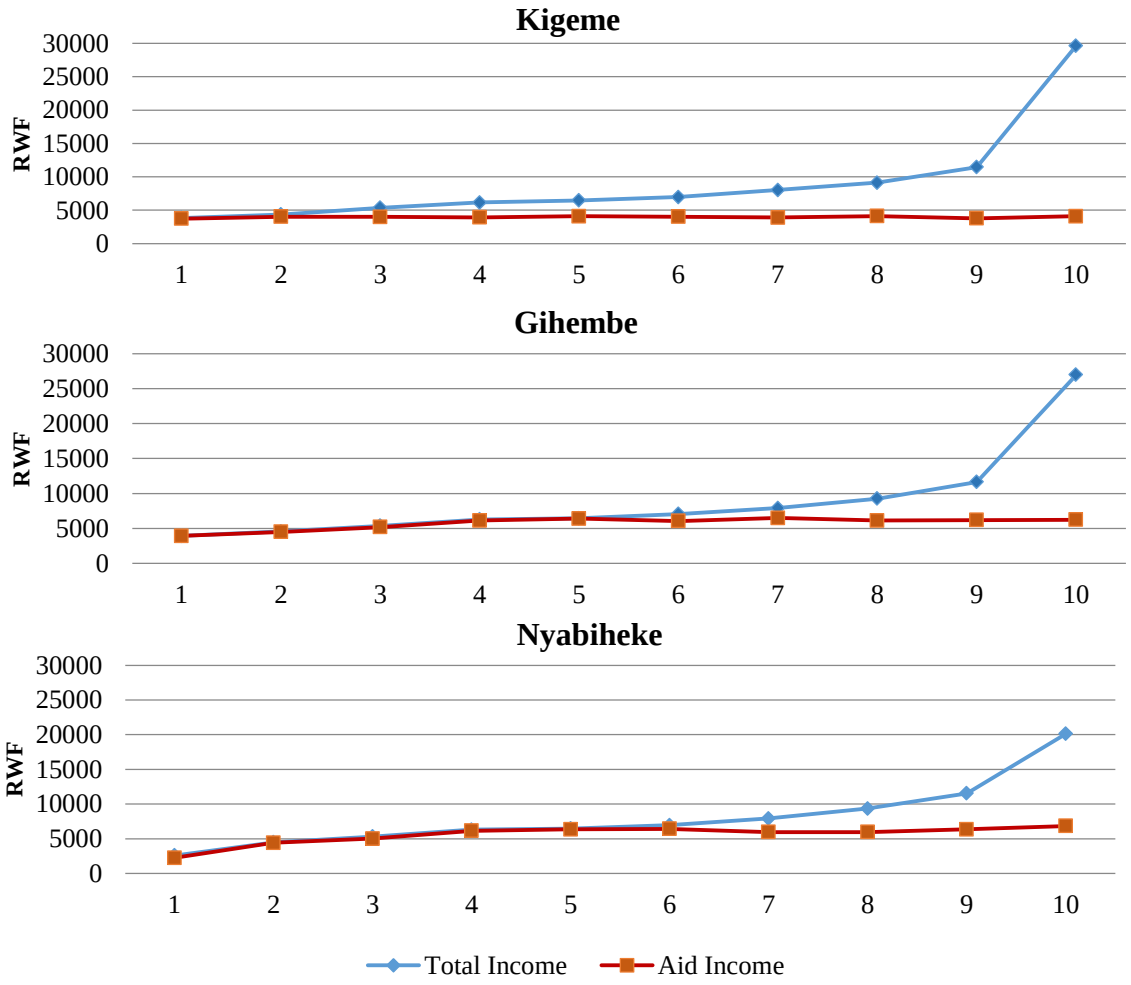

Figure 2. Total Per-capita Income in refugee households diverges sharply from per-capita aid income in the upper deciles (monthly income).

capita incomes averaged 9,159 to 10,393 RWF in the three camps (Table 6, bottom panel), compared to 12,644 to 18,855 outside the camps (top panel). Refugee incomes are highest where host-country incomes are highest (Gihembe). The headcount poverty rate is higher inside (0.724 to 0.755) than outside (0.605 to 0.556) the camps. However, the poverty gap index is considerably lower inside the camps, reflecting the income floor created by WFP food aid.

4. Exchange

Refugee households' income generation through active engagement with the host-country economy distinguishes life in a refugee camp from the camp economy described by Radford (1945). So do their connections with the host-country economy via exchange, which extends outside the borders of the Edgeworth Box.

Kigeme Camp: Life before Cash

Kigeme represents a refugee camp prior to the switch in food aid from in-kind to cash. Despite being an in-kind camp, it is not an entirely in-kind economy, because some refugees have wage employment outside the camp, the vast majority sell a part of their food aid in markets outside the camp, and most purchase at least some additional food items within the local host-country economy.

The food basket that refugee households receive in Kigeme Camp is comprised of 12.5 kilograms of maize grain, 3.7 kilograms of beans, 0.9 kilograms of oil, and 0.2 kilograms of salt per household member per month. Figure 3 shows the percentage of refugee households at Kigeme Camp that sell all or part of their allotments of maize, beans, oil, and salt in markets outside the camp. Around 80 percent of Kigeme refugee households sell some maize or cooking oil. 89 percent of households sold at least one of the four components of their packet (not shown). The amount sold differs by food item: on average one quarter of all maize allotments, smaller percentages of beans (2.5 percent) and cooking oil (3.9 percent), and no salt are sold in markets outside the camp.

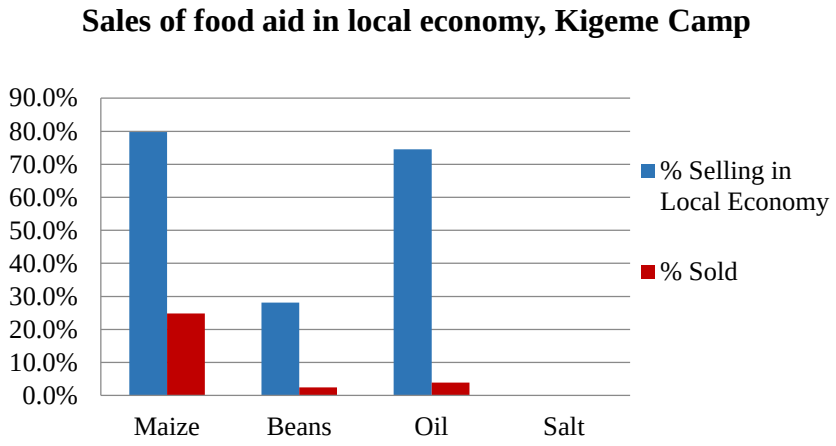

Figure 3. Nearly all Kigeme refugee households sell some food in the local economy surrounding the camp. Nearly one quarter of all maize they receive from WFP is sold outside the camp.

The cash the refugees obtain from these food sales, together with any other income they may have, enable refugees to purchase food and other items in the surrounding economy. Figure 4 shows the percentage of Kigeme refugees consuming different food items during the seven days prior to the survey and the percentage purchasing foods. The length of each bar gives the percentage of refugee households consuming the corresponding item. It is close to 100 percent for the key items included in the WFP food aid package (maize, beans, salt, and cooking oil), but for items not in the package it varies widely, from 72 percent for fresh vegetables to 0.4 percent for fresh meats. In light of the absence of cash aid in this camp, this diversity of consumption is striking.

For most food items, the majority consumed is from purchases (the lightly shaded portion of each bar). Most of the rest—including the majority of beans, maize, and cooking oil—is in-kind aid. For all foods, more than 70 percent of purchases are made in the local economy around the camp, with most of the remaining 30 percent purchased within the camp.[4]

[4] Besides purchases, food consumed during the seven-day recall period could come from gifts, loans, home production, or exchanges with other households.

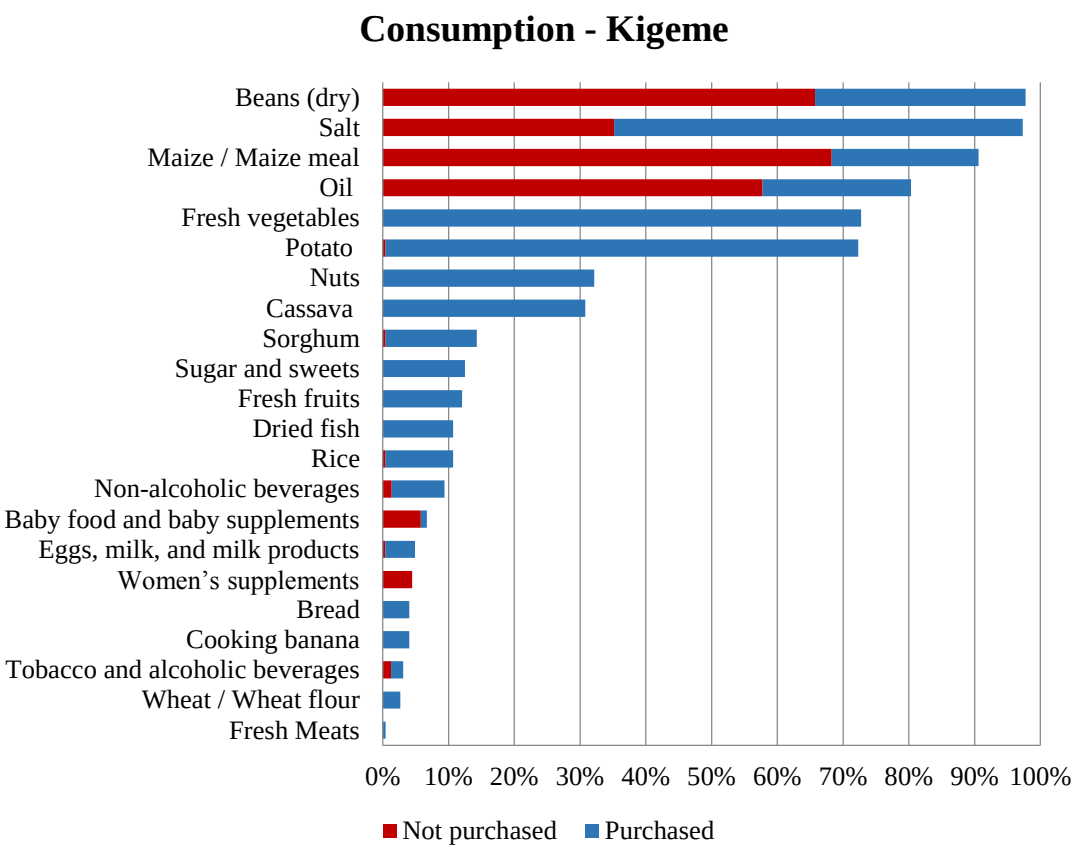

Figure 4. Most Kigeme refugee consumption of foods not in the WFP package is from purchases in the local economy outside the camp.

Food Packet Prices

The food packet given to refugee households in this camp is valued at 6,300 RWF, which is the amount that refugees receive in cash in the other two camps studied here. Our survey data on prices in the local economy shows that this is indeed the case. Using average prices reported by consumers in both refugee and local host-country households, we find that the refugee food packet per capita is worth 6,263 RWF when measured in consumer prices, with a standard deviation of 45.5 RWF.

Sales of in-kind aid are highest in refugee households without other sources of income. Over 91 percent of refugee households with no other sources of income sell some of their food packet. This decreases slowly with income. For example less than 70 percent households in the top decile sell any of their food packet.

In a highly competitive economic setting, refugee should be able to sell their food packet items at or near the market price. However, there is evidence of a price band due to transaction costs related to finding the best buyers: refugees consistently sell food aid at prices below market retail prices. Table 7 reports the ratio of sales to consumption prices. For both Maize and Cooking Oil, the most commonly sold items, the average ratio of the price at which refugee households sell to the price of the item in the market is 0.571 and 0.811, respectively and are both statistically different from 1. For beans the ratio is 0.832 and not significantly different from 1, possibly due to the lower number of sales recorded.

Table 7. Prices of food packet items

	Number of households in sample who sold item	Average Price per unit *Sold* in Kigeme	Average market price per unit in Kigeme	Ratio of Prices	Statistically less than 1?	Average Market Price in	
						Gihembe	Nyabiheke
Maize	177	175.64	310.55	0.571	Yes	378.48	279.51
Beans	63	306.65	368.13	0.832	No	417.59	393.74
Cooking Oil	167	1010.68	1252.94	0.811	Yes	1453.4	1409.7

We could not find any variables that significantly explained the differences in the ratio across refugee households. Ordinary least-squares regressions reveal constant ratios across age, sex, and education of the household head. In addition, we flipped the perspective and could not find a difference in the ratios based on who the household sold to (merchant or store versus other household). The only variable that was statistically significant was the refugees' time of arrival at the camp; the ratio is 0.05 lower for refugees who are newcomers to the camp.

As a result of these price bands, refugees cannot transform aid to cash without incurring a significant transaction cost, and this in turn limits their ability to use host-country markets to diversify food consumption. Based on the average selling prices in Table 7, the full-income value of the in kind food packet for refugees at Kigeme camp is 3,969 RWF, or approximately 64 percent of the packet's value in consumption prices. In other words, the cash that refugees could obtain by selling all of their WFP packet is only 64 percent of the packet's value.

We do not know whether what we see in and around Kigeme reflects what we would have seen in and around the other two camps before they switched to cash. However, we believe it likely

that refugees in Nyabiheke and Gihembe previously sold food and purchased goods in the local economy, just as those in Kigeme do today.

Cash Camps and Local Economies

Households in the two cash camps, Gihembe and Nyabiheke, receive a monthly cash transfer of 6300 RWF (approximately US$ 9) per member, accessible via cell phones. By taking their cell phone to a participating local business, they have the option of "cashing out" (taking the entire transfer in cash), making direct purchases with their cell phones, or any combination of the two.[5] A transaction fee applies to cash withdrawals after the initial one; this may encourage refugees to limit their withdrawals and possibly elect to cash out. Because they do not receive food aid in-kind, we anticipate that very few households in these camps sell food.

Our data reveal that most refugee households cash out then purchase food and other items, primarily in the local economy outside the camp. However, there appear to be some differences between the two cash camps, possibly reflecting the structure of the surrounding host-country economy as well as exposure to the new distribution mechanism.

Gihembe Camp: Settled into Cash

Gihembe Camp switched from in-kind to cash aid in early 2014; thus, refugees in this camp have had almost two years to adjust to the new distribution regime. Most households in this camp (79 percent) cash out after receiving their transfers. They use their cash to purchase food and other goods, primarily in local markets outside the camp.

Figure 5 shows food consumption and purchases by Gihembe households. Nearly all households consume the four components of the in-kind food-aid package they received prior to the switch to cash. Nearly all of these four food staples are purchased, and nearly two-thirds of the purchases are made in the local economy outside the camp. A significant majority also consume fresh vegetables, potatoes, and rice. Smaller percentages consume cooking bananas, potatoes, and fresh fruits and vegetables.

[5] The participating businesses include host-country businesses outside the camps and refugee businesses inside the camps.

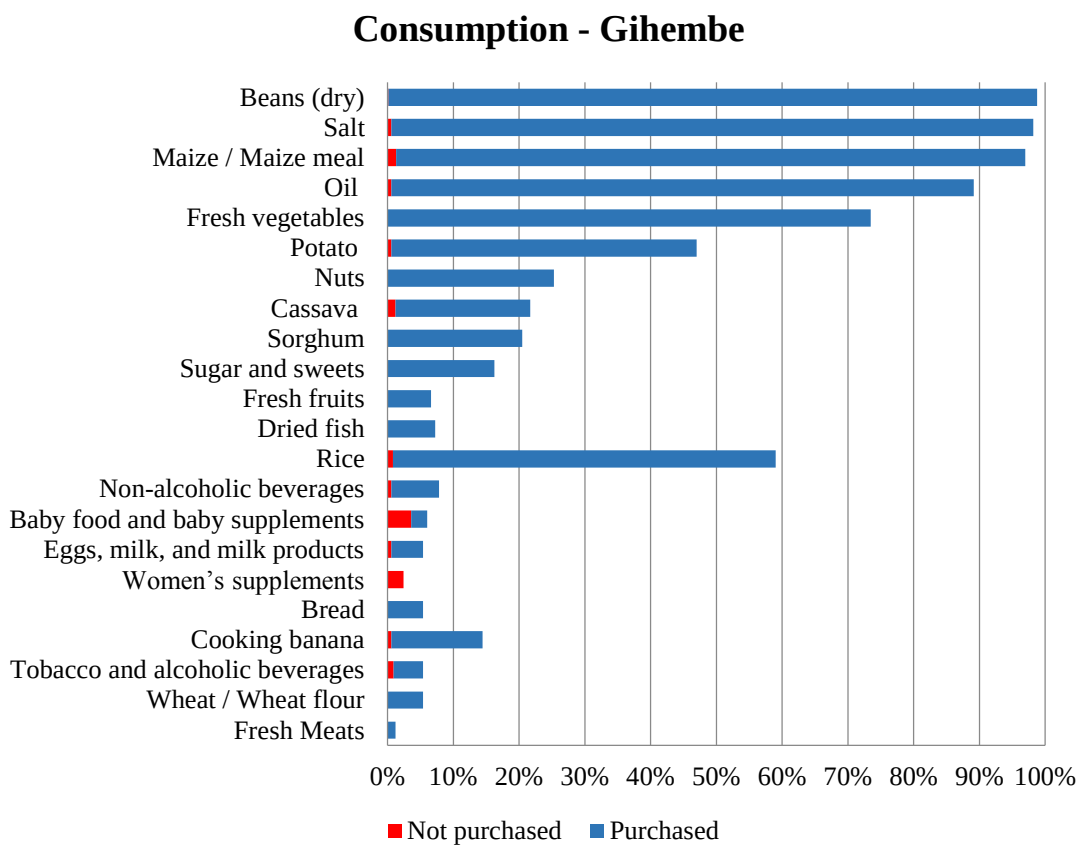

Figure 5. Nearly all Gihembe refugee households consume maize, beans, salt, and oil, the components of the WFP food package they received previously. More than half consume fresh vegetables, potato, and rice. The majority of these goods are purchased in the local economy inside and outside the camp.

Nyabiheke: An Agricultural Economy Adjusting to Cash

The Nyabiheke survey was carried out just two months after the adjustment from food to cash. Data from this camp portray an economy in transition from in-kind to cash assistance. Nearly all (94 percent) of Nyabiheke refugees immediately cashed out upon receiving their first transfers. A higher cash-out rate in Nyabiheke compared with Gihembe might reflect the stage of adjustment at which the two camps find themselves. However, it might also reflect a difference in the demand for cash between the two camps. Households' demand for cash might be different in localities where there is a relative abundance of food available to purchase in nearby markets. It might also reflect differences in incomes between the two camps.

Nyabiheke households, like their counterparts in Gihembe, use cash to purchase all of the items in the WFP food package they received prior to the shift to cash, but they also consume a wide

variety of other items (Figure 6). More than three quarters consume fresh vegetables; more than half consume rice and cooking banana. This dietary diversity is larger than at the other two camps. Most of the food is purchased in markets outside the camp.

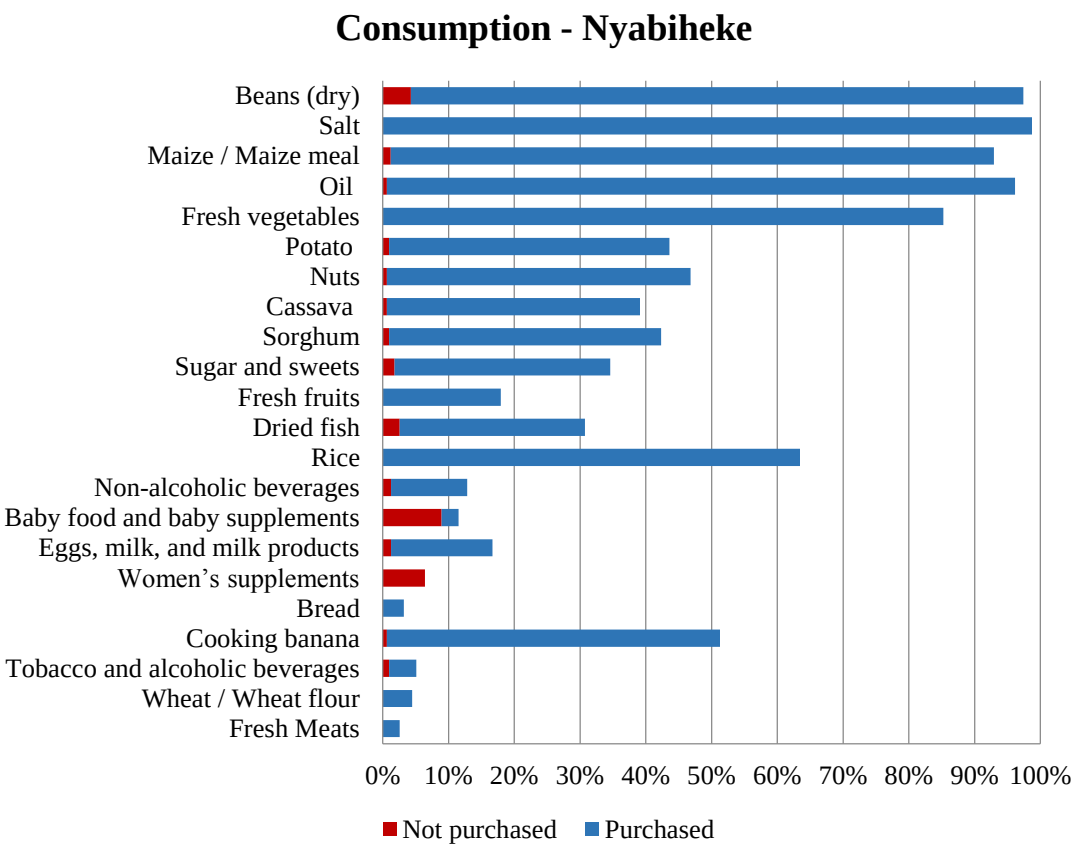

Figure 6. Nyabiheke camp households consume the ingredients of the WFP food package they received prior to the shift to cash, but also a diversity of other foods.

5. Aid Mechanism, Consumption, and Welfare

The findings presented above have important implications for the design of aid delivery mechanisms. Identifying the impacts of a change from in-kind to cash food aid is complex, because we do not have before-and-after data from camps. In Gihembe and Nyabiheke, we might imagine what food consumption and interactions with local food markets looked like before the shift to cash. Comparing the two cash camps to Kigeme reveals insights into how the switch to cash might affect food consumption and welfare.

Food Consumption

Figure 7 shows the differences in percentage of households consuming different food items between each of the cash camps and Kigeme. The bar indicates the difference in percentage between the average of the two cash camps and the Kigeme in-kind camp. Small bars mean that the share of households consuming the food item in the cash camps is similar to the share in Kigeme Camp.

The cash-camp households are virtually identical to Kigeme Camp households when it comes to consuming maize, beans, salt, and oil—the four components of the WFP food package. However, the tall bars starting with "rice" indicate that the cash-camp households are considerably more likely to consume rice and cooking bananas.

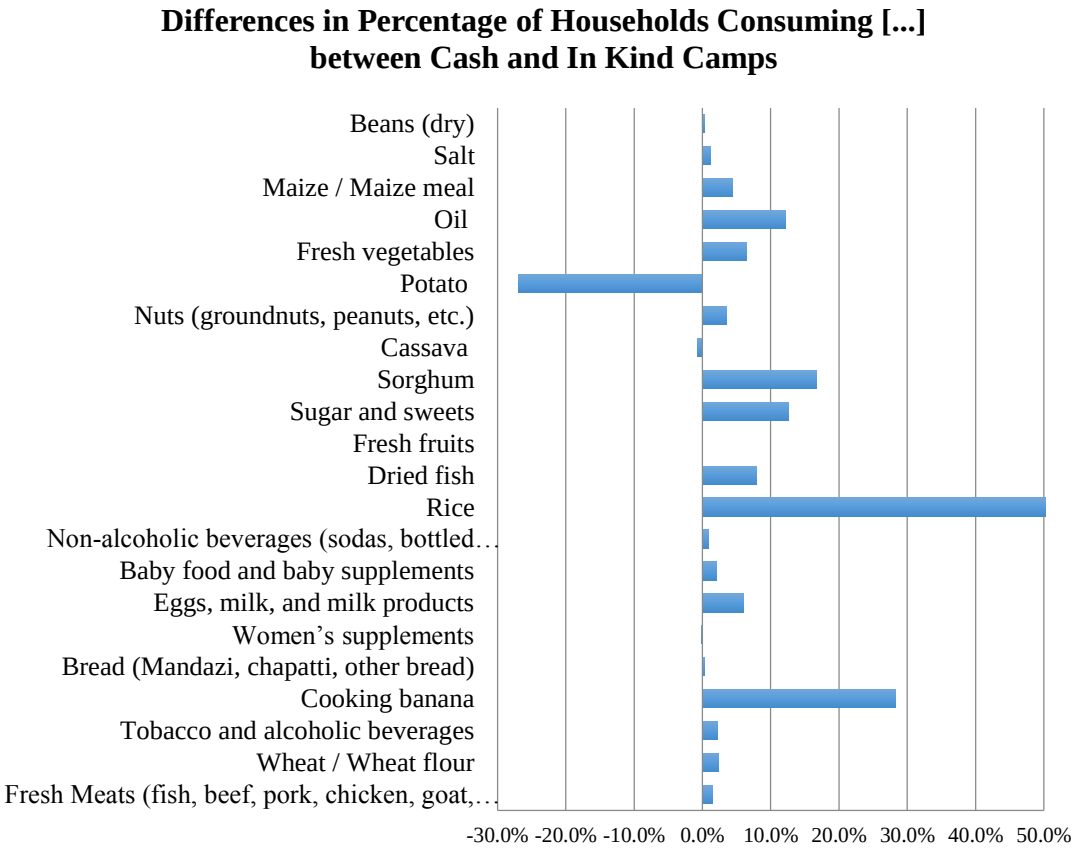

Figure 7. The two cash camps are similar to the in-kind camp in terms of consumption of the five staples in the WFP food package, but both demand more rice, sorghum, and cassava, and Nyabiheke Camp households consume considerably more of other foods.

Differences in food availability might explain observed differences in consumption across camps, making it difficult to isolate impacts of the switch to cash on dietary diversity. We can address this by using the consumption patterns of the local population as a baseline for each camp. Host-country households have higher income, on average, than refugee households; thus, we restrict our sample of host-country households to those with a per capita monthly income less than 12,600 RWF, double the value of aid given to refugees. We expect local households to have more diverse diets than refugees. To compare consumption across camps, therefore, we calculate the ratio of the percentage of households within each camp that consumed each food item and divide it by the percentage of nearby similar host-country households consuming the item.

Figure 8 reveals that this ratio is higher for the cash camps; that is, cash-camp diets look more like nearby host-household diets than do in-kind camp diets. Excluding the food packet items, the overall average of the ratio of percentage of refugee households to percentage of local households consuming a certain food item is 0.8 in the cash camps versus 0.65 in the in kind camp, and the difference is statistically significant.

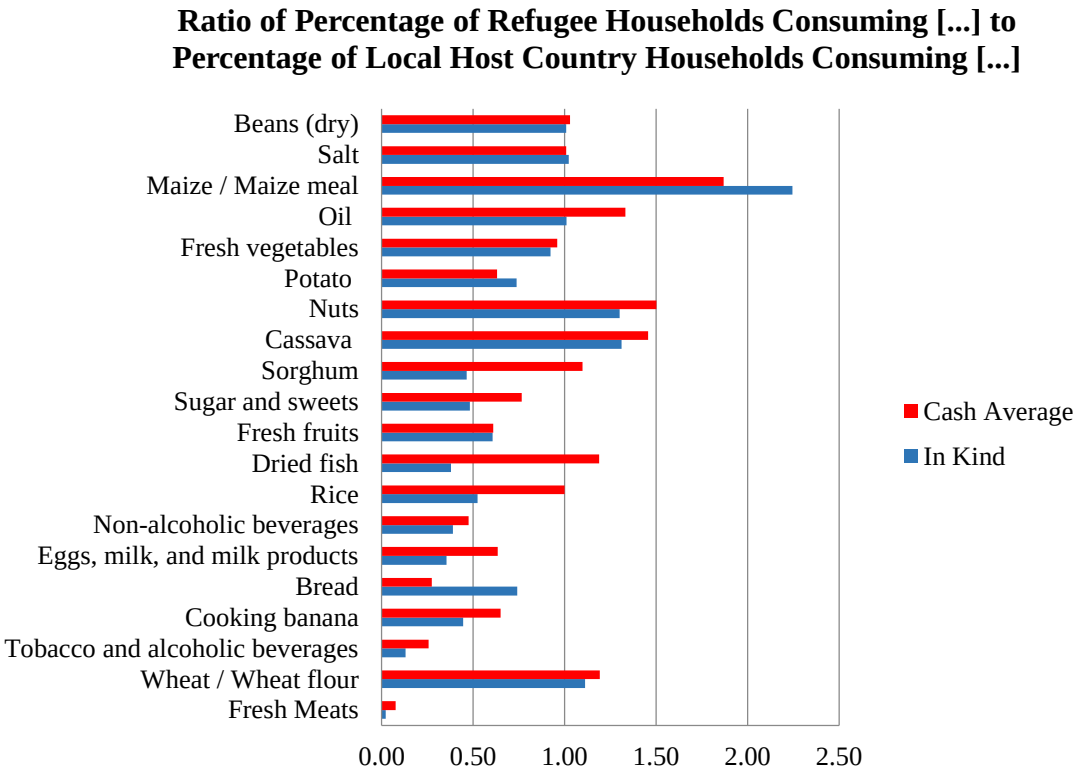

Figure 8. Cash-camp refugee diets more closely reflect the diversity found in host-country diets.

Refugee Welfare

We have seen that many refugees supplement food aid with income from other sources, sell in-kind aid in markets outside their camp, purchase food and other goods in host-country markets, and set up businesses inside the camp. These have important implications for the welfare impacts of shifting from aid in-kind to cash in refugee assistance programs.

Welfare indicators suggest that refugees in the cash camps are better off than those in the in-kind camp. Refugees at each camp were asked: *In the last 7 days, have there been times when your household did not have enough food or money to buy food?* Based on this question (Table 8), food security ("no" to this question) is lowest at Kigeme Camp (14 percent of households) and highest at Gihembe Camp (60 percent). In Nyabiheke Camp it is 39 percent of refugees assess themselves as being food secure. In addition, refugees were asked other questions related to food security such as: *How many days in the last week did you have to consume less preferred meals?* The shares of households who answered one day or none are shown in Table 8. It is clear from the shares that refugee households in the in kind camp are less food secure than those in the cash camps of Gihembe and Nyabiheke. However, host-country households surrounding Kigeme also show lower levels of food security than those around the other two camps (left panel of table 8).

Table 8. Welfare Indicators from Refugee Household Surveys

	Host-Country Households			Refugee Households		
	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
Share Food Secure	0.29	0.41	0.38	0.14	0.60	0.39
In the past 7 days, share of households that did not have to consume						
Less Preferred Meals	0.35	0.50	0.48	0.22	0.44	0.53
Borrowed Food	0.86	0.93	0.89	0.52	0.95	0.86
Fewer Meals	0.61	0.77	0.78	0.57	0.84	0.72
Smaller Portions	0.48	0.59	0.62	0.33	0.72	0.56
Share of Households that claim that						
Things are going well	0.33	0.37	0.31	0.17	0.34	0.23
Things are Not too difficult	0.36	0.41	0.37	0.17	0.36	0.30
They Are Happy	0.46	0.53	0.46	0.35	0.53	0.49

We also asked: *During the last week, how often have you felt that things are not going well?* and *During the last week, how often have you felt that difficulties accumulate so much that you cannot handle them? During the last week how often have you felt happy?* These questions are intended to reflect people's self-assessment of welfare and sense of control in life. For both of

the first two questions, the shares responding “not often” or “never” are considerably higher in Kigeme (0.17 for both) than Gihembe (0.34 and 0.36, respectively), with Nyabiheke again in between (0.23 and 0.30). The share of households in Kigeme who consider themselves *happy* in the past week are 0.35; in the cash aid camps of Gihembe and Nyabiheke, these shares are higher at 0.53 and 0.49 respectively.

There are limitations to what we can conclude from these comparisons because the three camps almost certainly differ in ways other than their exposure to cash. We do not have welfare self-assessments prior to the switch to cash in Gihembe and Nyabiheke camps, and we do not observe a switch to cash in Kigeme camp. However, we can garner some insights by comparing welfare in refugee to their surrounding host-country households.

While the circumstances in each location may differ, we compare refugee with host-country households as we did in the consumption section. Figure 9 shows the difference in shares between the local host-country households and their respective refugee households. Large positive bars indicate that a larger share of host than refugee households responded positively to the welfare questions presented to them. The black lines represent the confidence interval of that difference. In the two cash camps, we cannot differentiate between the welfare of refugees and their respective local host-country populations. As was the case with consumption, the difference between host-country and refugee household welfare indicators is not statistically different from 0 in the camps that receive aid in cash. However, this is not the case in the in kind camp. The difference is statistically greater than 0 at the 1 percent level for all welfare indicators except for the consumption of fewer meals. This is suggestive evidence that cash improves welfare among refugees, making them more closely resemble the surrounding local host-country population.

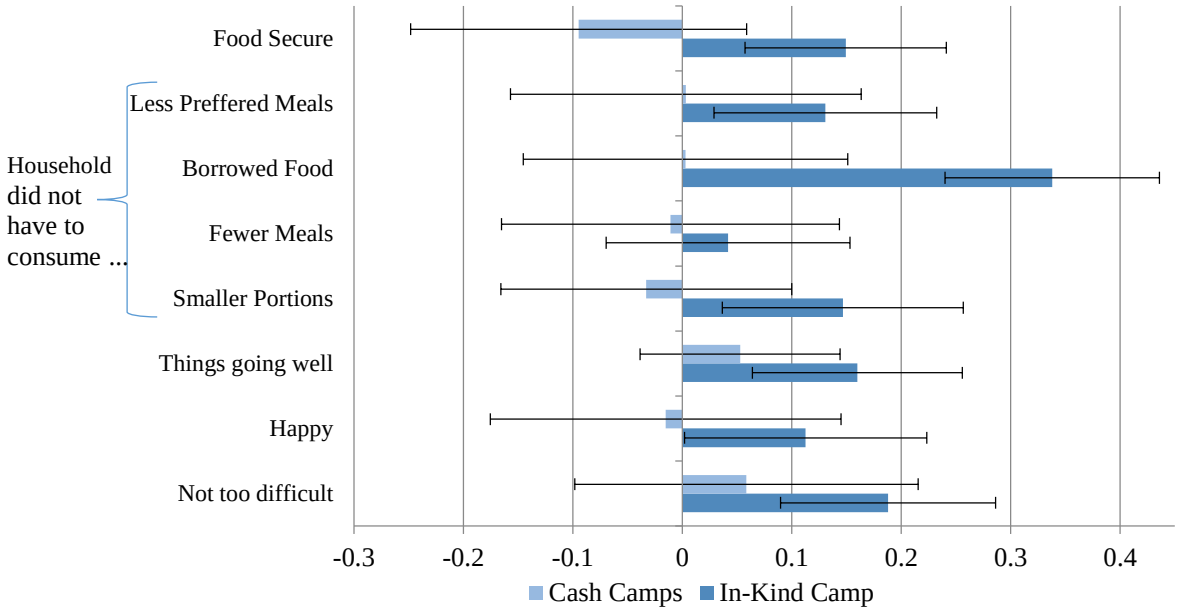

Figure 9. Difference between local host-country and refugee household shares of positive responses to welfare questions

To further explore the impact of switching from in-kind to cash assistance on refugee welfare, we estimated a series of regressions on welfare outcomes for refugees and non-refugees living around each camp (see Appendix Table A1). The regressions control for a large number of individual and household characteristics. Welfare in refugee households, differs significantly between the cash and in-kind camps. Kigeme refugees are significantly less likely to be food secure, spend significantly less on food, and are significantly less likely to agree with the statement: "Things are not too difficult these days." Food aid refugees are also less likely to consider themselves happy, and they are significantly more likely to have very high discount rates. It is plausible that these differences could be location-specific and not due to the in-kind aid. To compare, table A2 in the appendix shows the results from the same regressions for non-refugee households. The results show that non-refugees in the locality around the Kigeme refugee camp also lower levels of food security, although the difference is not as large as that of refugees.

In Table A3, we form indices for food security and welfare using principal component analysis[6] and we find that refugees in Kigeme exhibit especially lower levels of food security and welfare.

[6] The first principal component represents an index of all the different and correlated variables.

Host-country households in Kigeme are also less food secure than those in other locations, albeit to a lesser extent than refugees. When it comes to welfare, refugees in Kigeme have lower levels of reported welfare compared to refugees in other locations, whereas host-country households in Kigeme report similar levels of welfare as the other locations. This evidence is suggestive again of a gain in welfare and food security from receiving cash aid.

Welfare and Timing of Transfer

Given that the survey asks about the welfare and food security in the past week, it is plausible to think that the timing of the survey with respect to the receipt of the aid package could explain some of the variation in welfare answers. This hunch is validated in our regressions; time since receipt of aid is a strong predictor of the dependent variables. To investigate this further, we observe in Figure 10 that in-kind camp responses to the food security and happiness questions vary widely by time elapsed since last aid receipt. In the two weeks after receipt of a food packet, a little under 50 percent of households answer that they are food secure; however, later in the month this number goes down to less than 10 percent. In the cash camps, the level is higher overall but also is relatively stable throughout the month. When it comes to food security, it is plausible that refugees are better able to smooth consumption with cash.

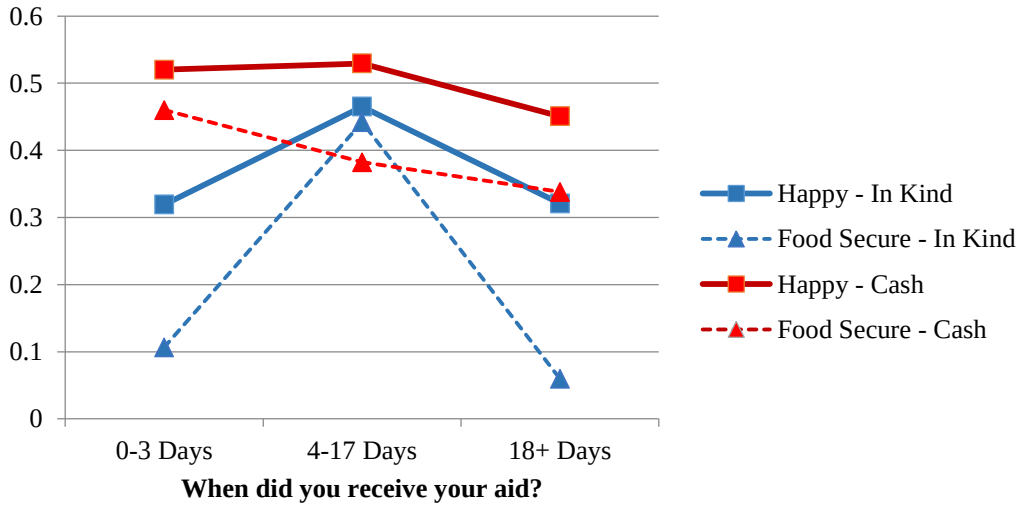

Figure 10. Responses to Food Security and Happiness questions vary by time since last aid receipt in in-kind camps

6. Conclusion

This unique glimpse into the economies of Congolese refugee camps in Rwanda leads us to three key findings:

First, when people are uprooted from their homelands and resettled into camps like the ones studied here, refugee economies arise. These refugee economies are more complex than Radford's (1945) "Edgeworth Box" POW camp economy.

Second, refugees' economic outcomes—and the structure of refugee economies—are shaped by refugees' capital—particularly human capital—as well as by the host-country economic context. Interactions with host-country economies result in a divergence of household income from refugee assistance.

Third, the shift from in-kind aid to cash increases refugee welfare, in fundamental ways. This finding is potentially relevant for other types of development assistance, as donors find themselves under pressure to shift to cash.

This paper does not consider the potential spillovers from refugee aid to nearby host economies. Refugees' heavy participation in host-country markets for consumption suggests that these spillovers may be large. Simulations using local economy-wide impact evaluation (LEWIE) models have shown the potential for large and statistically significant spillovers from other types of cash transfer programs (Taylor and Filipski, 2014; Filipski et al., 2015; Thome et al., 2013). The finding that households in the in-kind aid camp (Kigeme) actively buy and sell food in local markets prior to the shift to cash is evidence that refugee food aid impacts local economies even when aid is in-kind. This suggests that Kigeme could follow the other two camps' lead in becoming more involved in local markets once refugees there no longer have to sell rations in order to purchase food. It also leads us to suspect that households in Gihembe and Nyabiheke camps already were actively involved in outside markets prior the shift to cash there. Documenting spillovers from refugee assistance is the subject of a future paper.

The evolution of refugee economies clearly depends on the rules governing interactions with host-country economies as well as the structure of those economies. Restrictions of refugee interactions with the host economy constrain income and welfare by trapping refugees within

camps. The resettlement of refugees around the world takes different forms, ranging from isolated camps to nearly complete integration with host-country communities. We do not pretend to reach conclusions that are universally applicable to these diverse resettlement situations. However, our findings suggest that high costs of transacting with the host-country economy may encourage business formation within camps and erode the benefits of in-kind refugee assistance. On the other hand, refugee business access to outside suppliers of food and other commodities is critical to the success of camp businesses, given land and other resource constraints within camps. In the most extreme cases, isolation from host-country markets makes cash aid problematic and logically nudges the refugee camp economy in the direction of Radford's POW camp economy, with an emphasis on exchange rather than production.

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Appendix:

Section A – Welfare Regression Results

Table A1. Regression Results for the Welfare Indicators of Refugees

	(1) Per Capita Food Expenditure	(2) Food Secure	(3) Things are going well	(4) Things are not too Difficult	(5) Happy in past 7 days	(6) High Discount Rate
In Kind Transfers	-1,156.4***	-0.255***	-0.0714	-0.197***	-0.1461*	0.1462**
	(0.0000)	(0.0005)	(0.2569)	(0.0024)	(0.0661)	(0.0380)
Male Head	-140.7559	0.0336	-0.0071	0.0176	-0.0328	-0.130***
	(0.3013)	(0.5222)	(0.8651)	(0.6879)	(0.5526)	(0.0074)
Married Head	-111.4706	-0.0259	-0.0391	-0.0206	0.0111	0.0045
	(0.3931)	(0.6545)	(0.3773)	(0.6606)	(0.8477)	(0.9297)
Head (education)	4.1231	-0.0090	-0.0018	-0.0153*	0.0098	0.0006
	(0.8836)	(0.4023)	(0.8247)	(0.0756)	(0.3468)	(0.9518)
Head Age	6.3427	-0.0003	0.0001	0.0004	0.0010	-0.0022
	(0.2068)	(0.8821)	(0.9456)	(0.8080)	(0.6256)	(0.2544)
Head Sick (Month)	-85.8955	0.0482	-0.0352	-0.114***	0.0079	0.0338
	(0.4552)	(0.3938)	(0.4413)	(0.0097)	(0.8940)	(0.5331)
Time at Camp	12.4815	0.0093*	0.0026	-0.0039	-0.0026	0.0099*
	(0.4556)	(0.0933)	(0.5622)	(0.4316)	(0.6690)	(0.0766)
House has Debt	155.0845	-0.163***	-0.0549	-0.0617	-0.1103**	-0.0103
	(0.4187)	(0.0003)	(0.1265)	(0.1030)	(0.0171)	(0.8124)
Household Size	-345.01**	0.0095	-0.0124	-0.0119	-0.0454	0.1098
	(0.0376)	(0.9063)	(0.8430)	(0.8584)	(0.5747)	(0.1390)
Number of Children	89.4995**	-0.0582**	-0.0355*	-0.0053	-0.0325	0.0176
	(0.0252)	(0.0105)	(0.0548)	(0.7869)	(0.1742)	(0.3976)
Number Sick (Month)	-10.2099	-0.0094	0.0017	0.0082	0.0374*	-0.0338*
	(0.8008)	(0.6321)	(0.9134)	(0.6007)	(0.0755)	(0.0753)
Shock in Past Year	165.0399	-0.0067	-0.0582	-0.0822*	-0.0547	0.128***
	(0.1668)	(0.8967)	(0.1657)	(0.0568)	(0.3087)	(0.0079)
No Savings	95.8586	-0.0344	-0.0956*	-0.0573	-0.169***	0.0556
	(0.3776)	(0.5562)	(0.0624)	(0.2676)	(0.0058)	(0.3076)
Wants to Return to Congo	84.2923	0.0345	0.0616	0.0441	0.0718	-0.0223
	(0.5292)	(0.5534)	(0.1925)	(0.3922)	(0.2331)	(0.6858)
Number of Elderly (65+)	-184.5062	-0.0711	-0.0461	-0.0282	-0.0631	0.1141*
	(0.2382)	(0.3559)	(0.4283)	(0.6480)	(0.3958)	(0.0962)
Days Since last Transfer	9.9367**	-0.007***	-0.0018	0.0006	-0.0047**	-0.0008
	(0.0300)	(0.0010)	(0.3175)	(0.7433)	(0.0411)	(0.6805)
Number Working	-62.9989	-0.0596	-0.0318	-0.0180	-0.0047	0.0193
	(0.5133)	(0.1358)	(0.2855)	(0.5941)	(0.9120)	(0.6170)
Log of Income	525.68***	0.1791**	0.0621	0.1210**	0.0253	-0.0635
	(0.0093)	(0.0119)	(0.2406)	(0.0259)	(0.7301)	(0.3381)
Owns Business	52.7491	-0.0106	0.0357	0.0820	-0.0257	0.1427**
	(0.7108)	(0.8771)	(0.5543)	(0.1880)	(0.7269)	(0.0225)
Receives Remittances	-177.3260	0.0079	-0.0406	-0.0703	0.0266	0.1181*
	(0.2261)	(0.8991)	(0.4212)	(0.1470)	(0.6935)	(0.0500)
Constant	-641.0742					
	(0.8042)					
Observations	544	544	544	544	544	544
R^2/Pseudo R^2	0.1681	0.241	0.183	0.209	0.0938	0.0617

Robust p-values in parentheses*** p<0.01, ** p<0.05, * p<0.1

Table A2. Regression Results for the Welfare Indicators of Host-Country Households

	(1) Per Capita Food Expenditure	(2) Food Secure	(3) Things are going well	(4) Things are not too Difficult	(5) Happy in past 7 days	(6) High Discount Rate
In Kind Transfers	-1,311.5664	-0.121***	0.0048	0.0213	-0.0059	0.0188
	(1,179.8868)	(0.0434)	(0.0429)	(0.0453)	(0.0464)	(0.0428)
Male Head	-1,487.5425	0.0573	0.0815	0.0431	-0.0779	-0.0880
	(1,453.4317)	(0.0709)	(0.0718)	(0.0783)	(0.0816)	(0.0727)
Married Head	-703.5291	0.0636	0.0077	0.0651	0.0562	0.0758
	(749.8777)	(0.0693)	(0.0695)	(0.0709)	(0.0770)	(0.0722)
Head (education)	136.7894	0.0140	0.0111	0.0144	0.0073	-0.0124
	(92.6457)	(0.0091)	(0.0088)	(0.0093)	(0.0099)	(0.0088)
Head Age	-48.5302	0.0025	-0.0035	-0.0024	-0.0011	0.0028
	(37.8531)	(0.0021)	(0.0022)	(0.0022)	(0.0023)	(0.0021)
House has Debt	1,594.1328	-0.0483	-0.0407	-0.0622	0.0502	0.0440
	(1,310.0651)	(0.0430)	(0.0416)	(0.0442)	(0.0460)	(0.0417)
Household Size	1,070.2764	0.0530	0.0048	-0.0375	-0.1049	-0.0459
	(1,083.9452)	(0.0653)	(0.0654)	(0.0665)	(0.0746)	(0.0649)
Number of Children	-1,272.9625	0.0026	0.0037	0.0058	-0.0092	0.0284
	(1,155.1628)	(0.0238)	(0.0227)	(0.0236)	(0.0251)	(0.0235)
Number Sick (Month)	-420.5954	0.0047	-0.0185	-0.0040	-0.0270	-0.0342**
	(408.4814)	(0.0159)	(0.0152)	(0.0162)	(0.0177)	(0.0154)
Shock in Past Year	-728.6828	-0.181***	-0.184***	-0.1724***	-0.136***	0.1169***
	(764.9404)	(0.0421)	(0.0406)	(0.0431)	(0.0453)	(0.0406)
No Savings	826.3564	-0.146***	-0.136***	-0.1380***	-0.166***	-0.0348
	(942.9728)	(0.0453)	(0.0444)	(0.0465)	(0.0470)	(0.0437)
Number of Elderly (65+)	-166.5025	0.0727	0.0167	-0.0051	-0.0995	-0.0365
	(482.6019)	(0.0625)	(0.0618)	(0.0631)	(0.0701)	(0.0610)
Number Working	-771.3479	-0.0536**	-0.0256	-0.0227	-0.0180	0.0034
	(670.5135)	(0.0266)	(0.0240)	(0.0250)	(0.0264)	(0.0240)
Log of Income	-32.1762	0.1162***	0.0686***	0.0614***	0.0456***	-0.0287*
	(258.9808)	(0.0283)	(0.0222)	(0.0223)	(0.0167)	(0.0172)
Owns Business	2,870.6857	0.0662	0.0525	0.0558	0.1169*	0.0426
	(2,515.7923)	(0.0626)	(0.0601)	(0.0647)	(0.0637)	(0.0570)
Involved in Agriculture	-1,898.48**	-0.270***	-0.0952	-0.111*	-0.1361**	-0.1145**
	(893.5172)	(0.0675)	(0.0613)	(0.0639)	(0.0608)	(0.0528)
Has Livestock	-512.8441	0.1151**	0.1697***	0.1662***	0.0659	-0.0366
	(576.2229)	(0.0488)	(0.0450)	(0.0469)	(0.0491)	(0.0451)
Receives Remittances	6,060.4549	0.0048	0.0343	-0.0560	0.1621*	0.0352
	(5,335.8237)	(0.0880)	(0.0844)	(0.0841)	(0.0861)	(0.0777)
Constant	6,894.8024					
	(8,247.5145)					
Observations	579	579	579	579	579	579
R^2/Pseudo R^2	0.0884	0.245	0.164	0.162	0.117	0.0516

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table A3. Principal Component Regressions

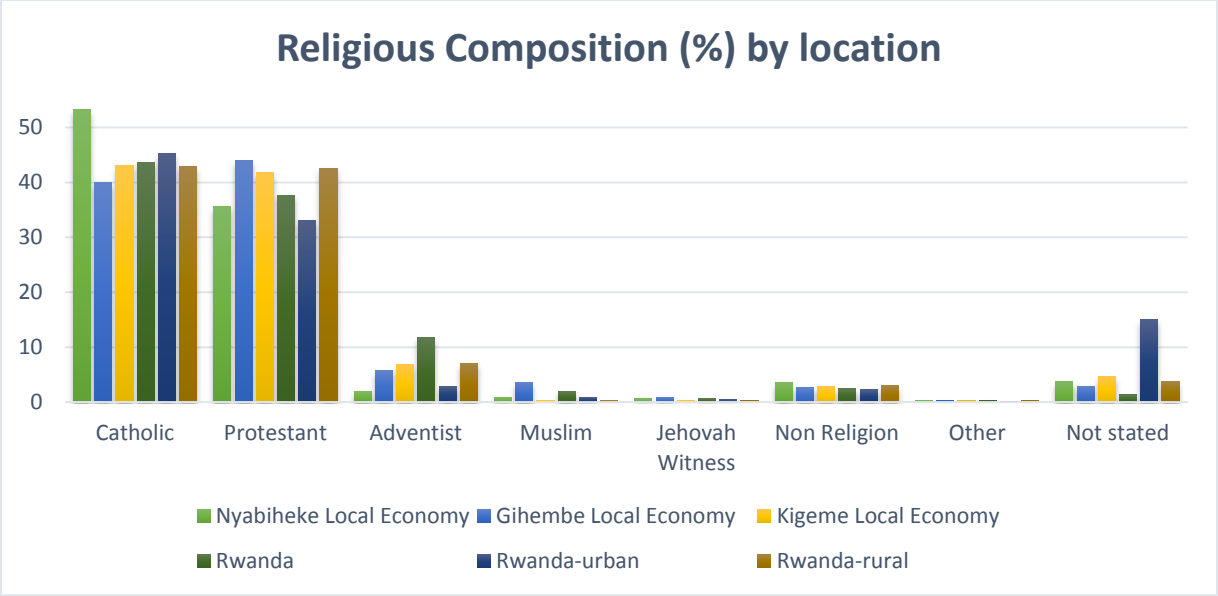
	(1) Food Security PC - Refugees	(2) Food Security PC – Host Country	(3) Welfare measures PC - Refugees	(4) Welfare Measures PC – Host Country	(5) Food Security PC Pooled	(6) Welfare Measures PC Pooled
In Kind Transfers	-0.884***	-0.4472***	-0.2413	0.0828	-0.4655***	0.0762
	(0.2015)	(0.1194)	(0.2256)	(0.1190)	(0.1184)	(0.1175)
Male Head	-0.0323	0.4591**	0.1922	0.0872	0.1516	0.2273*
	(0.1412)	(0.1997)	(0.1433)	(0.2143)	(0.1178)	(0.1165)
Married Head	-0.1282	-0.1160	-0.0473	0.1898	-0.0987	0.0496
	(0.1561)	(0.1909)	(0.1461)	(0.2033)	(0.1220)	(0.1162)
Head (education)	-0.078***	0.0311	-0.0326	0.0375	-0.0192	0.0061
	(0.0250)	(0.0246)	(0.0276)	(0.0246)	(0.0177)	(0.0182)
Head Age	-0.0081*	0.0107**	0.0011	-0.0066	0.0018	-0.0025
	(0.0045)	(0.0046)	(0.0049)	(0.0046)	(0.0032)	(0.0033)
debt	-0.432***	-0.0901	-0.3098**	-0.0460	-0.2337***	-0.1588*
	(0.1161)	(0.1144)	(0.1306)	(0.1205)	(0.0830)	(0.0889)
Time at Camp	0.0330**		0.0109			
	(0.0154)		(0.0180)			
Days Since last Transfer	-0.022***		-0.0096			
	(0.0058)		(0.0059)			
Household Size	0.1845***	-0.0115	0.0841	-0.0032	0.1053***	0.0458
	(0.0507)	(0.0451)	(0.0527)	(0.0463)	(0.0356)	(0.0354)
Number of Children	-0.1262**	-0.0790	-0.0686	-0.0204	-0.0950**	-0.0508
	(0.0610)	(0.0610)	(0.0624)	(0.0603)	(0.0453)	(0.0435)
Number Sick (Month)	0.0180	0.0038	-0.0431	-0.0942**	-0.0012	-0.0737**
	(0.0470)	(0.0417)	(0.0491)	(0.0410)	(0.0324)	(0.0322)
Shock in Past Year	-0.2180*	-0.5944***	-0.2731**	-0.6459***	-0.4585***	-0.5043***
	(0.1284)	(0.1154)	(0.1371)	(0.1210)	(0.0872)	(0.0889)
No Savings	-0.396***	-0.4468***	-0.3307*	-0.5471***	-0.4032***	-0.4516***
	(0.1498)	(0.1227)	(0.1686)	(0.1291)	(0.0958)	(0.0997)
Number Working	-0.0220	-0.1480**	-0.1416	-0.0859	-0.1323**	-0.0925*
	(0.1028)	(0.0654)	(0.1111)	(0.0668)	(0.0522)	(0.0530)
Log of Income	0.6295***	0.2665***	0.6137***	0.1763***	0.3035***	0.2168***
	(0.1844)	(0.0425)	(0.2034)	(0.0423)	(0.0456)	(0.0428)
Owns Business	-0.1672	0.4463***	0.0481	0.2968*	0.2284*	0.2417*
	(0.1780)	(0.1613)	(0.2062)	(0.1729)	(0.1195)	(0.1257)
Receives Remittances	0.1296	0.3213	-0.0079	0.1006	0.2718**	0.1112
	(0.1676)	(0.2016)	(0.1765)	(0.2236)	(0.1303)	(0.1376)
Refugee HH					0.0902	-0.1324
					(0.1178)	(0.1280)
Refugee*In-Kind					-0.8998***	-0.4940***
					(0.1684)	(0.1714)
Constant	-5.041***	-2.2275***	-5.4989***	-1.0405**	-2.3467***	-1.6041***
	(1.6863)	(0.5125)	(1.8559)	(0.5171)	(0.4794)	(0.4594)
Observations	544	579	544	579	1,124	1,124
R-squared	0.3409	0.2818	0.1021	0.2395	0.2596	0.1653

Section B – Demographic Characteristics of Refugees and Host-Country Households

Table B1. Demographics of Rwanda and the Local Economy around the camps at Sector level

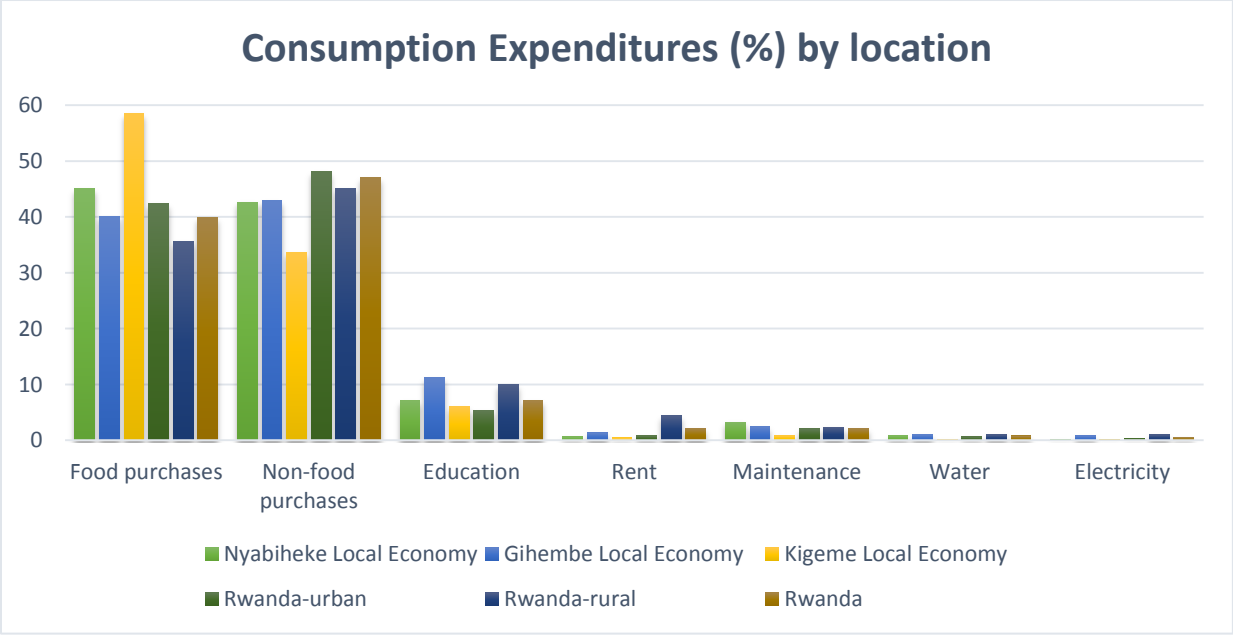
Camp Name	District	Sector	Population	Population Density (per square km)	% Female Headed HH	Average HH Size	Net Attendance Rate in Primary Schools
Nyabiheke	*Gatsibo*	Gatsibo	36,690	598	26.3	4.3	86.1
		Gitoki	33,409	446	27.6	4.3	86.5
		Kageyo	21,567	385	24	4.3	83.5
		Ngarama	30,354	519	25.7	4.2	85.3
		Nyagihanga	24,159	336	24.5	4.3	91.3
Gihembe	*Rulindo*	Kisaro	19,868	520	27.4	4.5	93.7
	Gicumbi	Ruvune	18,962	324	22.6	4.4	93.7
		Bwisige	15,288	326	23.3	4.5	94
		Byumba	36,401	755	28.2	4.2	91.2
		Kageyo	30,270	961	27.3	4.6	91.7
		Nyankenke	21,560	675	30.1	4.4	91.2
		Rukomo	24,989	485	23.1	4.6	90.4
		Shangasha	15,929	485	25.5	4.5	93.4
Kigeme	*Nyaruguru*	Mata	13,900	224	32.9	4.5	94.1
	Nyamagabe	Gasaka	41,522	1027	31.3	4.3	84.7
		Kamegeri	13,579	416	31.9	4.2	88.5
		Kibirizi	21,479	436	29.3	4.5	88.7
		Kibumbwe	12,518	256	36.8	4.1	89.6
		Tare	22,765	511	32.1	4.5	89.8
Rwanda-rural			8,778,289	-	29.8	4.3	87.9
Rwanda-urban			1,737,684	-	23.6	4	90.6
Rwanda			10,515,973	415	28.7	4.3	88.2

Source: National Institute of Statistics of Rwanda (Population and Housing Census of Rwanda, 2012)



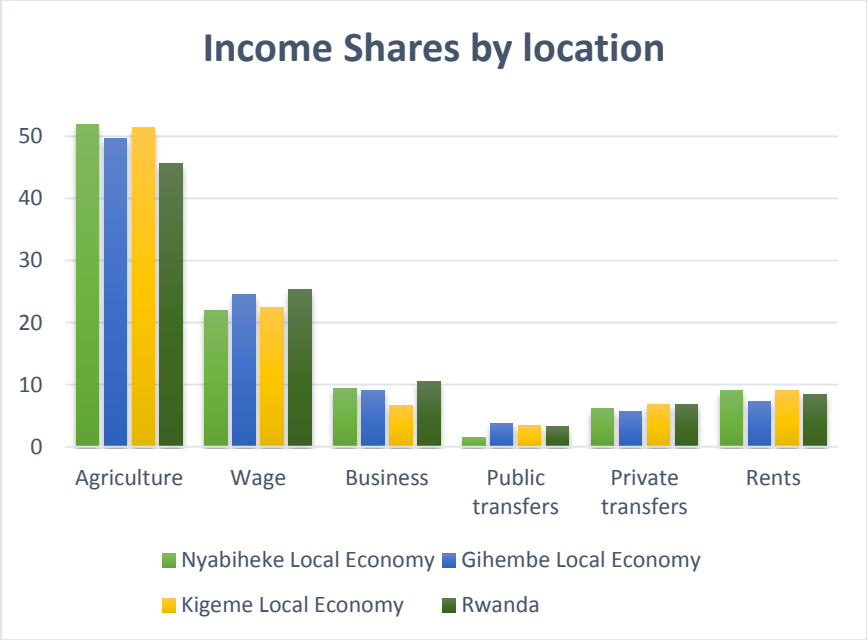
Source: National Institute of Statistics of Rwanda (Population and Housing Census of Rwanda, 2012)

Figure B1. Religious Composition of Rwanda and the Local Economy around the camps at District level



Source: National Institute of Statistics of Rwanda (Population and Housing Census of Rwanda, 2012)

Figure B2. Consumption Expenditures of Rwanda and the Local Economy around the camps at District level



Source: National Institute of Statistics of Rwanda (Population and Housing Census of Rwanda, 2012)

Figure B3. Income Shares of Rwanda and the Local Economy around the camps at Provincial level

Section C – Multidimensional Poverty

Table C1. Variables and weights used in the calculation of the poverty index

Dimension	Dimension Weight	Variable	Variable Weight
Education	3	Not all children 6-16 enrolled in school	2
		No person in household has more than 5 years of schooling	1
Health	5	More than half of household reported sick in past month	2
		Household members not treated when sick	2
		Not all household members sleep under mosquito net	1
Food Security	2	Household is not food secure	2
Living Conditions	2.5	No protected source of water, no separate kitchen, no stove, no beds, cooks with inefficient wood or worse	0.5 each
Income	2	Household has no source of income such as wage work or business	2

The results are robust to different weights and change only slightly:

Table C2. Robustness of the poverty patterns to the choice of *k* the the multidimensional poverty threshold

	Host-Country Households			Refugee Households		
	Kigeme	Gihembe	Nyabiheke	Kigeme	Gihembe	Nyabiheke
k=7	0.270233	0.249383	0.270748	0.465402	0.220047	0.342652
k=8	0.220508	0.199074	0.227709	0.417287	0.1916	0.300717
k=9	0.172954	0.144907	0.171125	0.328497	0.141399	0.206631
k=10	0.148834	0.123457	0.114198	0.202505	0.091867	0.136201
k=11	0.111911	0.090586	0.096022	0.088046	0.023762	0.063441