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Migration and Economic Mobility in Tanzania

Evidence from a Tracking Survey

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Abstract

This study explores the extent to which migration has contributed to improved living standards of individuals in Tanzania. Using longitudinal data on individuals, the authors estimate the impact of migration on consumption growth between 1991 and 2004. The analysis addresses concerns about heterogeneity and unobservable factors correlated with both income changes and the decision to migrate. The findings show that migration adds 36 percentage points to consumption growth, during a period of considerable growth in consumption. These results are robust to numerous tests and alternative specifications. Unpacking the findings, the analysis finds that moving out of agriculture is correlated with much higher growth than staying in agriculture, although growth is always higher in any sector if one physically moves. Economic mobility is strongly linked to geographic mobility. The puzzle is why more people do not move if returns to geographic mobility are high. The evidence is consistent with models in which exit barriers are set by home communities (through social and family norms) that prevent migration of certain categories of people

This paper—a product of the Poverty Team, Development Research Group—is part of a larger effort in the department to study the links between migration and economic development. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at kbeegle@worldbank.org.

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1. Introduction

Finding routes out of poverty remains a key issue for households and policy makers alike. A long-term vision of development suggests that poverty reduction is associated with intergenerational mobility out of rural areas and agriculture, and into urban non-agricultural settings. Physical and economic mobility seem to go hand-in-hand. Standard economic theory has multiple narratives of how physical and economic mobility interact. The Lewis model offers a stylized description of rural transformation, with sector mobility of labor from agriculture into 'modern' production processes. At least in its original specification, the model suggests initially a gap in earnings between rural and urban locations (Lewis, 1954).[1] The Harris-Todaro model emphasizes the migration process and that relative individual earnings incentives matter, so that both pull and push factors will drive migration. However, in equilibrium, migration would equalize expected returns, and no further migration would be observed; *on average*, welfare levels in rural and urban economies would equalize (Harris and Todaro, 1970). Other work, such as the 'new economics of migration' (Stark and Bloom, 1985), emphasizes that migration is part of a general livelihood strategy for the initial household as a whole. Migration is part of a welfare maximizing strategy with a clear role for overall household income growth but also a role for risk sharing. For example, Rosenzweig and Stark (1989) find that migration patterns for marriage in rural India are consistent with risk-sharing strategies of the initial household. Recent evidence has highlighted not just the role of networks in facilitating migration from home areas, but also how migration is closely linked to migrants' access to social networks in the areas of destination (Munshi, 2003) or to community rates of out-migration (Kilic et al., 2007).

While this emphasis on the process of migration in most recent empirical work has provided many insights, few of these studies can convincingly address the question whether migration leads to improved living conditions. A major problem is having access to data that allow a careful and convincing assessment of the relative welfare of migrants and non-migrants, due to the standard evaluation problem: an individual cannot be observed to be both a migrant and a non-migrant. A few studies have access to experimental data, such as international migration lotteries (e.g. McKenzie, Gibson, and Stillman, 2006), but most studies have to work with non-experimental data. Without experimental data, the key concern, unobserved heterogeneity affecting both outcomes and the process of migration, persists. This leads to a

[1]For example, Lewis wrote (Lewis, 1954, p. 150): 'Earnings in the subsistence sector set a floor to wages in the capitalist sector, but in practice wages have to be higher than this, and there is usually a gap of 30 per cent or more between capitalist wages and subsistence earnings'.

quest for imaginative and convincing instruments for migration (see the review of the migration and poverty literature by McKenzie and Sasin, 2007, and the references therein). An additional hurdle is the need for panel data to study migration and economic mobility. The costs and difficulties in re-surveying migrants mean that attrition may be relatively high for this group and may also result in the loss of some of the most relevant households to study this process (Beegle, 2000; Rosenzweig, 2003).

This paper uses unique data from a region in Tanzania to address this key question: What is the impact of physical movement out of the original community on poverty and wealth? Although we do not have experimental data, the nature of our data allows us to limit the potential sources of unobserved heterogeneity considerably. Building on a detailed panel survey conducted in the early 1990s, we re-interviewed individuals in 2004, making a notable effort to track individuals who had moved.

The tracking of individuals to new locations proves crucially important for assessing welfare changes among the baseline sample. The average consumption change of individuals who migrated was more than four times higher than that of individuals who did not moved. Those who had moved out of the Kagera Region by 2004 experienced consumption growth that was 10 times higher compared to those who remained in their original community. These averages translate into very different poverty dynamics patterns for the physically mobile and immobile. For those who stayed in the community, poverty rates drop by about 4 percentage points over these 13 years. For those who moved elsewhere within the region, poverty rates drop by about 12 percentage points, and for those who moved out of the region, they drop by 23 percentage points. Had we not tracked and interviewed people who moved out of the community – a practice found in many panel surveys – we would have seriously underestimated the extent to which poverty has gone down over the past 13 years in the Kagera Region; we would have reported poverty reduction at about half of its true value. Clemens and Pritchett (2007) raise similar concerns in the context of income growth and international migration. In addition, the data would omit the part of the population with a high information content on pathways out of poverty.

Still, these statistics are not evidence that moving out of the community leads to higher income growth. As noted above, we cannot observe the counterfactual: What would income growth have been for migrants had they not migrated? We exploit some unique features of these data to address concerns about unobserved heterogeneity. First, individual fixed effects regressions for movers and stayers produce a difference-in-difference estimation of the impact of physical movement, controlling for any fixed individual factors that affect consumption. Second, we can control for *initial* household fixed effects in the growth rate of consumption since we observe baseline households in which some individuals migrate

and other do not. This controls for observable and unobservable factors fixed to the family that can affect the growth rate of consumption. Thus, we identify the impact of migration on income using within-household variation in migration. Together, these estimations address many possible sources of heterogeneity, such as (genetic) health and ability endowments, risk aversion, wealth constraints, and market, risk and environmental circumstances. We find that movement out of the community results in 36 percent higher consumption relative to staying. Comparing results with and without fixed effects, our results suggest that migrants are more likely to be from families with higher earning growth possibilities.

One weakness of this approach, however, is the implicit assumption that within families, migration is random, which is a strong assumption. For example, in view of the standard Harris-Todaro model of individual migration, earnings differentials drive migration, so that those who are observed to have migrated from within a household tend to have had higher earnings potential than those that stayed behind, implying that within-family migration may not be random.[2] We use Two-Stage Least Squares (2SLS) methods to deal with this potential endogeneity. The 2SLS estimates show limited evidence of unobserved individual heterogeneity affecting the consumption growth. In short, unobservables at the household level correlated with growth potential appear to matter, whereas individual heterogeneity does not.

We explore two additional avenues of interest: Is it migration to urban areas driving these results, and is migration capturing changes in sector of work which explains the consumption growth we observe? We find suggestive evidence that physical mobility has an independent effect, beyond its association with moving out of agriculture or moving to more urban areas. The paper then uses these results in conjunction with the literature on network externalities and poverty traps to explain why, if migration has such large pay-offs, more people do not move. It concludes that the findings are consistent with models in which exit barriers are set by home communities (through social and family norms), preventing migration of certain categories of people when windows of opportunity arise. Being willing and able to leave behind what you know appears to be a strong determinant of economic mobility.

In the next section, we first provide the context on the changes in economic fortunes in Tanzania in the last decade. Section 3 presents the data used in the analysis and section 4 provides the basic indicators to assess economic and welfare changes. In section 5, the method used to assess the impact of migration is briefly described, section 6 presents the results and section 7 some robustness checks. Section 8 builds a

[2] This is correct, even if in equilibrium, when no further migration takes place, expected earnings are equal.

narrative around the regressions and aims to explain why not more people migrate when benefits of doing so are so high.

2. The Setting: Tanzania and Kagera, 1994-2004

In the last decade, Tanzania has experienced a period of relatively rapid growth, attributed to liberalization, a renewed trade orientation, a stable political context, and a relatively positive business climate to boost economic performance. Real GDP growth was of the order of 4.2% per year between 1994 and 2004, while annual population growth was around 3.2% in the same period (URT, 2004). There is also evidence that growth had accelerated in the last few years compared to the 1990s. However, this growth has not been sufficiently broad-based to result in rapid poverty reduction. On the basis of the available evidence, poverty rates have declined only slightly and most of the poverty reduction progress has been made in urban areas. According to the Household Budget Survey (HBS), between 1991 and 2000/01, poverty declined from 39 percent to 36 percent in mainland Tanzania. The decline in poverty was steep in Dar es Salaam (from 28%to 18%) but minimal in rural Tanzania (from 41% to 39%). These declines in poverty rates are not fast enough to attain the Millennium Development Goals.

For the purposes of this study, it is useful to consider the Kagera Region specifically. The region is far from the capital and coast, bordering Lake Victoria, Rwanda, Burundi and Uganda. It is overwhelmingly rural and primarily engaged in producing bananas and coffee in the north and rain-fed annual crops (maize, sorghum, cotton) in the south. Relatively low-quality coffee exports and agricultural produce are the main source of income. Mean per capita consumption is near the mean of mainland Tanzania in 2000. Likewise, growth and poverty reduction appears to mirror the rest of Tanzania: real GDP growth was just over 4 percent per year between 1994 and 2004, while poverty in Kagera is estimated to have fallen from 31 percent to 29 percent between 1991 and 2000/01 (Demombynes and Hoogeveen, 2007).

The challenges of poverty reduction in Kagera seem to be representative for provincial Tanzania as a whole: while some pockets, such Dar es Salaam and other coastal areas, have had substantial growth and poverty reduction, the problem is how to deliver this growth and poverty reduction to other areas. This reflects the typical problem of land-locked, agriculture-based economies: how to deliver poverty reduction if the main engine of growth appears to be elsewhere (De Weerdt, 2006).

3. The Data

The Kagera Health and Development Survey (KHDS) was originally conducted by the World Bank and Muhimbili University College of Health Sciences (MUCHS), and consisted of about 915 households interviewed up to four times from fall 1991 to January 1994 (at 6-7 month intervals) (see World Bank, 2004, and http://www.worldbank.org/lsms/). The KHDS 1991-1994 serves as the baseline data for this paper. Initially designed to assess the impact of the health crisis linked to the HIV-AIDS epidemic in the area, it used a stratified design to ensure relative appropriate sampling families with adult mortality. Comparisons with the 1991 HBS suggest that in terms of basic welfare and other indicators, it can be used as a representative sample for this period for Kagera (results not shown but available upon request).

The objective of the KHDS 2004 survey was to re-interview all individuals who were household members in any round of the KHDS 1991-1994 and who were alive at the last interview (Beegle, De Weerdt and Dercon, 2006). This effectively meant turning the original household survey into an individual longitudinal survey. Each household in which any of the panel individuals live would be administered the full household questionnaire. Since the set of household members at baseline have subsequently moved, and usually not as a unit, the 2004 round results in more than 2,700 household interviews (from the baseline sample of 912 households).

Although the KHDS is a panel of respondents and the concept of a 'household' after 10-13 years is a vague notion, it is common in panel surveys to consider re-contact rates in terms of households. Excluding households in which all previous members are deceased (17 households with 27 people), the field team managed to re-contact 93% of the baseline households. This is an excellent rate of recontact compared to panel surveys in low-income countries *and* high-income countries. The KHDS panel has an attrition rate that is much lower than that of other well-known panel survey summarized in Alderman et al. (2001) in which the rates ranged from 17.5% attrition *per year* to the lowest rate of 1.5% per year. Most of these surveys in Alderman et al. (2001) covered considerably shorter time periods (two to five years).

Figure 1 charts the evolution of households from baseline to 2004. One-half of all households interviewed were tracking cases, meaning they did not reside in the baseline communities. Of those households tracked, only 38% were located nearby the baseline community. Overall, 32% of all households were not located in or relatively nearby the baseline communities. While tracking is costly, it is an important exercise because migration and dissolution of households are often hypothesized to be important

responses to hardship and a strategy to escape poverty. Excluding these households in the sample raises obvious concerns regarding the selectivity of attrition. In particular out-migration from the village, dissolving of households, and even marriage, may be responses to changing economic or family circumstances. At the same time it will provide a unique opportunity to study these responses: who uses them, what is the effect, and do they get people out of poverty.

Turning to re-contact rates of the sample of 6,204 respondents, Table 1 shows the status of the respondents by age group (based on their age at first interview in the 1991-1994 rounds). The older respondents were much more likely to be located if still alive, which is consistent with higher migration rates among the young adults in the sample. Among the youngest respondents, over three-quarters were successfully re-interviewed. Excluding people who died, 82% of all respondents were re-interviewed. Table 2 shows the location of respondents. Without tracking, re-interview rates of surviving respondents would have fallen from 82% to 52% (2,780 out of 5,394 survivors). Non-local migration is important: restricting the tracking to nearby villages would have resulted in 63% re-contact of survivors. Migration also proved to be an important factor in determining whether someone was re-contacted. Respondents who were untraced were much more likely to be residing outside Kagera (43%) compared to their counterparts who were re-interviewed (8%).

The consumption data come from an extensive consumption module administered in 1991 and again in 2004. The consumption aggregate includes home produced and purchased food and non-food expenditure. The non-food component includes a range of non-food purchases, as well as utilities, expenditure on clothing/personal items, transfers out and health expenditures. Funeral expenses and health expenses prior to the death of an ill person were excluded. Monetary levels were adjusted to account for spatial and temporal price differences, using price data collected in the Kagera survey in 1991 and 2004, and, for households outside Kagera, data from the National Household Budget Survey. Consumption is expressed in per capita, per annum terms. The poverty line is set at TZS 109,663, calibrated to yield for our sample of respondents who remained in Kagera the same poverty rate as the 2000/1 National Household Budget Survey estimate for Kagera (29%).

4. Growth, Poverty and Physical Mobility in Kagera

In this section, we discuss changes in living standards overall, and the changes for four mutually exclusive groups based on residence in 2004: (i) still residing in the baseline community, (ii) residing in a

neighboring community, (iii) residing elsewhere in the Kagera Region and (iv) residing outside the Kagera Region.

Table 3 shows that the basic needs poverty rate declined 8 percentage points in the full sample. This figure masks significant differences in changes between subgroups based on migration. For those found residing in the baseline community, poverty rates dropped by 4 percentage points, but rates dropped by 11, 13 and 23 percentage points for those who moved to neighboring communities, elsewhere in Kagera Region and outside the Kagera Region respectively. A similar pattern is found for consumption per capita. While consumption per capita grew by $65 overall, it grew by only $30 for those found in the same community and by $65, $100 and $287 for those who moved to neighboring communities, elsewhere in Kagera Region and outside the Kagera Region respectively. Dividing consumption into food and non-food components gives the same result. The most basic assessment of welfare changes would have been wrong if we had focused only on individuals still residing in the community, a practice found in many panel data surveys. We would have underestimated the growth in consumption by half of its true increase.

The differences in consumption changes of groups in Table 3 are statistically significant, as shown in Table 4. Excluding respondents who have relocated would omit those with the higher rates of income growth and poverty reduction. Table 5 reports confidence intervals for the incremental samples (which are not mutually exclusive); it gives a more detailed picture of how inference on consumption growth and poverty reduction would have changed if we had not tracked movers. It is apparent that inference from a 'simple' panel survey of respondents continuing to reside within the original communities would have produced underestimates of actual consumption growth and poverty reduction in this population.

These conclusions are robust across the distribution of consumption, as well as at the mean and poverty line. Panel A in Figure 2 depicts the cumulative density function for consumption per capita for those people who remained living in the same community. Panels B, C and D make the same graph for respondents found residing in neighboring communities, elswehere in Kagera Region and outside Kagera Region. As respondents were located further from their location in 1991, so the difference between the 1991 and 2004 graphs becomes more pronounced. Note how, for people who remained in the baseline community, the 1991 and 2004 distributions lie close to each other under the poverty line and diverge above it, while for other mobility categories there is more divergence at the bottom of the graph.

Figures 3, 4 and 5 offer another cut of the data, comparing consumption of non-movers to movers in 1991 when both were living in the same community (Panel A) and in 2004 (Panel B). There is almost no difference between non-movers and movers in 1991, but by 2004, we observe divergent income levels. This divergence becomes greater as one compares those who stayed with those who moved further away (i.e. Figures 4 and 5).

What drives the association between migration and income growth? One plausible explanation is that migrants are relocating to less remote, less poor areas. By 1991, 68 percent of the sample was living in rural villages, of which a little over half were categorized by the survey team as poorly connected in terms of infrastructure. The remainder of the sample were living in (or close to) the regional capital, Bukoba (17%) or other small urban centers in Kagera (14%). Table 6 investigates whether moving to a better connected center (e.g. from a poorly connected to a better connected village, or from a rural area to an urban center) is correlated with higher consumption growth.[3] This is indeed the case: about 10 percent of the sample moved to a better-connected area and they experienced 86 percent consumption growth. For those who moved to a similar area, consumption increased by 42 percent, while those who moved to a less urban or less-connected center experienced a lower increase in consumption (about 25 percent). Clearly, it matters where you move, but moving seems in itself to matter too.[4]

Another plausible source of income growth for migrants is that they have moved to a different sector with respect to income. In Table 7, we explore whether migration is correlated with occupational or sector change. We examine the main source of individuals in 1991 and 2004. Consumption growth is highest for those who moved into non-agriculture (67 percent), with also considerable growth for those who were in non-agriculture to start with. It is striking that the 10 percent who actually moved into agriculture from non-agriculture faced declining consumption, suggesting that this is a sign of hardship and possibly a means of coping with it. Table 8 reports consumption growth by both sector change and migration. A considerable number of people switched sectors without migrating, but, within each category of sector status, migrants had much higher consumption growth than non-migrants: main source of income matters

[3] Tables 6 and onward are restricted to the sample in the main regressions (N=3,227). From the full sample of 4,432, we exclude, in this order, 715 people who were not interviewed in wave 1 (but, rather, were in waves 2, 3 and/or 4), 15 people in 1-person households, 267 people missing either wave 1 or wave 5 consumption expenditure, 120 people missing peer's schooling, 2 people missing parental education, and 86 people with incomplete data in wave 1.

[4] In order to investigate clustering of migration patterns, all households were sorted into 'tracking zones' indicating the geographical area in which they resided in 2004. Tabulating, for each tracking zone, the village of origin of the households tracked in that zone did not reveal any discernable patterns of clustered migration. Per tracking zone there was never any origin-village that dominated, with the exception of villages that lie within or neighbor the tracking zone.

for consumption growth, but it is strongly related to migration as well. For example, those who moved out of agriculture while also moving out of their original community in this period almost doubled their consumption levels, while those who switched into agriculture staying within the community faced reduced consumption by 12 percent.

5. Assessing the Impact of Migration on Consumption Outcomes

The correlations above do not resolve whether this consumption growth is in fact directly related to migration or whether it is spurious. To investigate this further, we explore several empirical approaches. First, we employ a difference-in-difference estimator, comparing consumption growth of those who moved with those who stayed in their baseline community. We define $ln\ C_{it}$ as the natural logarithm of consumption per capita for individual i in period t, and M_i as a dummy which is one if the individual was found to have physically moved out of the original community between t and $t+1$, and zero otherwise. The difference-in-difference specification is:

$$\Delta ln\ C_{it+1,t} = \alpha + \beta M_i + \gamma X_{it} + \delta_{ih} + \varepsilon_{it} \qquad (1)$$

in which $\Delta ln\ C_{it+1,t}$ is the growth rate of consumption per capita in the household in which i is residing in the two periods. This specification controls for individual fixed heterogeneity which might be impact the level of consumption in each period. This resolves a large number of possible sources of endogeneity, such as risk aversion or ability, likely to affect both migration and income outcomes. However, it does not address concerns about heterogeneity among families or individuals affecting growth in consumption and the migration decisions. For example, current wealth may affect the ability to migrate as well as the potential to grow between t and $t+1$. Our data again offers us excellent opportunities to control for a wide set of factors in this respect. First, we have data on multiple individuals from the original household, which allows us to control for any initial household level heterogeneity (δ_{ih}) that may affect the growth of consumption by estimating (1) using "initial household" fixed effects (IHHFE). The result is that the impact of migration is identified using within initial household variation – differences between members of the same initial household, effectively controlling for initial growth paths. Secondly, we can control for a set of individual level factors that may affect consumption growth and possibly as well migration by including these as X_i in the regression model (1). The variables used as individual conditioning variables for the growth of consumption from baseline are individual variables (sex, age, education and education

squared, education relative to the age-specific peer groups[5], and marital status) and family background variables (number of biological children in the initial household at baseline interacted with the age-sex group of these children, the number of biological children living elsewhere interacted with the distance to the regional capital, and the years of education of the biological mother and father). We also include a variable indicating whether the individual lost both parents between 1991 and 2004, allowing a separate effect if the individual was below 15 at baseline. Quite a few of these variables are also likely to affect migration, but may also have direct effects on consumption growth such as educational levels, marital status, parental death or having children living elsewhere (offering opportunities for remittances).

Despite controlling for fixed individual heterogeneity and both fixed and time-varying household-level heterogeneity (including initial growth paths) and the additional control variables, unobserved individual factors may still affect migration as well as consumption growth. We extend the analysis to 2SLS estimates, using three types of variables for instruments for the migration decision: pull-factors, push-factors and variables reflecting social relationships.

The pull-factors include age and baseline location. Migration opportunities and incentives are typically stronger for young male adults, as employment in low skill and physically demanding activities is likely to be easier for them. Similarly, if a family were to decide on who should migrate to capture opportunities, then allowing a young male adult to go would seem sensible. Costs and information needs for migration may well be affected by how far the opportunities are located. We include an interaction term of the distance to the regional capital and whether the person is male and between 5 and 15 at baseline (so between 18 and 28 in 2004) as a measure of the opportunities available.[6]

Individuals may also be 'pushed' into migration (or families may decide to send someone) when shocks occur. We include a measure of economic shocks experienced by the household by including the mean deviation of rainfall between 1991 and 2001 from the local average, interacted by being male and in the 5 and 15 age group as a measure of this 'push' factor (with higher values defined as high-deviation rainfall).

[5] A substantial number of the in the sample involved were below 18 at baseline and did therefore not necessarily complete their education by then. However, as it is most appropriate to enter only characteristics at baseline as controls, we constructed a variable of education relative to their peers: the absolute deviation of education levels compared to mean education for the age-specific peers at baseline for those below 18 and relative to other adults for the rest of the sample, allowing a more straightforward comparison across age groups. Alternative specifications, such as allowing for age-specific education variables via interactions did not change the findings nor their interpretation.

[6] The non-interacted variables are all included as determinants of consumption growth via X_i and δ_{ih}.

Finally, migration is likely to be affected by norms and social circumstances. In particular, who is able or expected to migrate within a household is likely to be determined by one's relation or position in the household. We include indicators for being the head or spouse of the household head at baseline which is expected to make it less likely that this person will leave relative to others in the household. Age rank among those between 5 and 15 (with the youngest receiving the highest value) is also included. These indicators are unlikely to determine the consumption growth of the household one is living in, but may well affect whether a person is allowed, chosen, or chooses to migrate. Lastly, close family members, the closest relatives of the household head, sons and daughters, may have different probabilities of leaving the household's community, than other residents, such as cousins or nephews. Local norms on marriage are patri-local: girls are expected to move to the community of their husbands after marriage and husbands are expected to stay where their father was based. We include an indicator for being the son of the household head at baseline. While both sons and daughters of the head may be expected to be more likely to stay in the community than other initial household members, patri-locality would make this probability higher for boys than for girls.

In sum, this means we are using a set of six instruments. Although we can show that statistically convincing and close to identical results can be obtained by only using a subset of these instruments, we use the full set of instruments in the reported results.

While our main measure of migration (M_i) is an indicator for having moved, we also substitute this for the log of the distance moved (kilometers from the original community of the location in which the individual was found in 2004, 'as the crow flies', set to 0 for non-movers). We will also extend the multivariate analysis to explore the role of moving to more urbanized areas and the role of sector movement in raising consumption growth.

6. Regression Results

Table 9 presents the basic results for the initial household fixed effects (IHHFE) and 2SLS estimates (means for covariates are in Appendix Table 1). For each we estimate using an indicator for having moved and a measure of distance of the move. The 2SLS estimates in column (3) and (4) use the six instruments defined above. In Table 10, we present the first stage results of regressions explaining migration or the distance traveled in migration.

Before turning to the variables of interest, we will briefly discuss the coefficients on the control variables. Recall that all effects are identified using *within* initial household variation. Those who are relatively better educated at baseline, relative to their peers within the household, experienced much higher consumption growth – and the effect is strongly convex. Having an educated father has an additional effect on growth. The younger cohort has done considerably better, as did males still unmarried at baseline. Strikingly, those with biological female children over 15 years in the household at baseline did worse. This is not explained by dowry (as bride price is the norm) but may rather capture the inability to arrange a marriage, possibly indicating that the daughter is not an attractive match, a trait possibly correlated with factors affecting consumption growth over time as well. In general the effects of the control variables remain stable over the various specifications.

Turning to the migration variables, we observe in the IHHFE regression, there is a larger and statistically significant impact of migration on consumption growth. Moving out of the community results in an increase of 36 percentage points in consumption growth over this 13-year period. As migrants move further from their baseline community, the impact is higher. These effects are very large, with migration resulting in large divergence in income between people who initially lived together, usually parents, siblings and other close relatives. Because this is the impact comparing within families, it nets out any transfers from migrants to non-movers. That is, if migrants sent remittances back to their origin households, then the estimates in Table 9 are a lower bound of the impact of moving (see also the results in next section on alternative definitions of the consumption aggregate, excluding transfers out). It also seems counter to the theory that the migration decision is part of a household-level maximization strategy (although it cannot preclude that this is partly true).

Turning to the first stage results in Table 10, in terms of basic diagnostics, our set of excluded instruments appear strong and valid: the Cragg-Donald (F) test shows a value of 11.70 for the movement dummy, and 9.07 for the distance regression, especially in the former case comfortably above the level of 10 often recommended for rejecting weak instruments (and in the latter case, still with relative limited bias in the Stock and Yogo, 2003, tables).

Some interesting patterns explaining migration emerge from Table 10. First, education offers very strong and convex effects to leave one's community. Being unmarried, but especially being female and unmarried is correlated with a higher probability of migration (consistent with patri-locality). When looking more specifically at the identifying instruments, we find significant effects, consistent with expectations: positional variables in the household matter, with a head and spouse less likely to leave, as

are children of the head (relative to others belonging to the household). The effect is however considerably larger (more negative) for male children of the head – again consistent with patri-locality, as marriage norms would also suggest that sons are more likely to be expected to stay in the community than daughters. Older members among the children in the household are more likely to migrate, possibly reflecting some kind of pecking order, given the opportunities available. Rainfall shocks increase the probability of leaving. Finally, pull factors, like being young, male and residing close to the regional capital, increase the probability of leaving. The results are also consistent between either the regressions with the dummy variable for migration and with the distance migrated variable. In short, while not aiming to obtain a structural model, we find suggestive correlates for the process of migration from within the households. These include better income opportunities (education and distance to the regional capital), norms of settlement and marriage, and other social factors.

The 2SLS results (IV with fixed effects) in columns 3 and 4 of Table 9 are almost identical to the IHHFE results. They are slightly less statistically significant (as can be expected from IV regressions given their lower efficiency), but still significant at 5 percent. Thus, there is no evidence that unobserved individual time-varying heterogeneity affects the non-instrumented results. For the distance variables, the results are marginally smaller (the coefficient is 0.10 compared to 0.12), suggesting limited evidence of a positive bias in the earlier results (i.e. migrants traveling longer distances are those with somewhat higher unobserved consumption growth potential, consistent with expectations). Still, the difference is remarkably small. The conclusion is strong: being able to move out of the village or community appears to an important factor for consumption growth. If those who moved had stayed behind, our evidence suggests that they would not have done as well.

The fact that there is little change going from the IHHFE to the 2SLS results does not suggest that there is no selection process in the migration decision. For example, it could be expected that more able people migrate. There is some evidence that this occurs, yet this heterogeneity is not at the individual level but at the household level. Estimating the 2SLS without IHHFE increases the coefficient on migrant status by almost a third (from 0.37 to 0.57). This is consistent with the proposition of positive selection among households: individuals from households with *high* earning potential migrate. *Within* the household, there seems to be no unobserved heterogeneity in terms earning potential among those who migrate or not.

These results are not driven by the lack of a parsimonious set of instruments or relatively weak instruments. The results are similar when restricting the instrument set. When focusing only on the relational variables (head, spouse, son, daughter), the Cragg-Donald (F) statistics become 14.5 and 11.3,

the Sargan is not rejected while the coefficient on physical movement stays at 0.36 and the distance variable becomes 0.097, virtually identical to results in Table 9.

The validity of our interacted instruments assumes that they do not capture different growth rates (e.g. because of different labor markets) across these groups within households. Growth rates might be influenced by the distance to the regional capital, rainfall, gender, age, etc. additively, there is no evidence to suggest that the interaction of these would capture different growth rates outside of the migration effect. To explore this point, we exploit the fact that the 1991-1994 baseline data consist of four waves. The wave 1 data were used as the baseline for this paper because the consumption recall period was identical to the follow-up survey (wave 5). We use the three interim waves (2-4) which have similar recall periods to check the validity of our interacted instruments. Using a measure of annual consumption per capita growth for 1992-1993 we can check whether our instruments, appropriately defined for this period, jointly or individually explain these baseline consumption changes. We find that they do not, giving further confidence that the exclusion restriction is valid for our instruments: the instruments do not influence growth except through migration. Of course, this regression of baseline growth rates on our instruments can only be valid if migration can be plausibly omitted from it. We do find that 1992 was the year with lowest and 1993 with third lowest migration rates out of all the years between 1992 and 2004, suggesting that the omission of the migration variable from the regression should not to lead to specification errors. As can be expected, the same exercise for the regressions of Table 9, with the endogenous moved variable replaced directly by the instruments, does yield jointly significant instruments (at 10%).

7. Robustness

We perform a variety of checks to verify the robustness of these findings. First, we access the results using alternative definitions of the consumption aggregate, in particular to the exclusion of transfers out, which could be an important driver of our results if remittances to one's origin village are large. We have data on transfers sent between the 2004 households of the same origin. The size of these remittances is on average only small percent of total consumption. Our findings are robust to excluding this component.

Second, we check the role of the configuration of the data. Our outcomes are household-level measures of consumption per capita in levels and growth, assigned to individuals. We re-structure the data to the 2004 household level in Appendix Tables 2 & 3 (using average characteristics as controls and appropriately

defined household-level aggregated instruments). The results are very similar and consistent irrespective of analyzing the data at the individual or household level.

Third, concerns may be raised that changes in household size and composition in new households in 2004 are driving these results. Appendix Table 4 shows that migrant households are smaller in terms of members or adult-equivalent members. Appendix Table 5 repeats the analysis using adult equivalent units rather than household size as the denominator and finds essentially similar results

Fourth, we investigate whether lack of common support drives the results. The coefficients in the IHHFE regressions are identified from the sample households that had "split up" from the baseline. Restricting the sample to the 2,940 individuals from at least two split-offs in 2004 yields identical results in both the IHHFE and 2SLS estimations. We further refine this by examining the sample of individuals from origin households that split-off into at least one household that moved by 2004 (N=2,520) and the sample of individuals from an origin households that had at least one split-off that remained in the village (N=2,777). These samples yield identical results, both for IHHFE and 2SLS. Restricting the sample further to baseline households that had at least one split-off that moved and one that remained in the village (N=2,357) yields identical IHHFE results, but has 2SLS estimates of 0.23 and 0.68 for the migration indicator variable and distance variables, significant at 10% and 7% respectively, and with IV diagnostics that remain sound. Taken together these sample restrictions do not cast doubt on the validity of the results, although would suggest that the size of the effects may be slightly lower than indicated in Table 9.

8. Social Constraints and Windows of Opportunity

The observed high pay-off from migration contradicts the equilibrium conditions from the Harris-Todaro model, where in equilibrium expected earnings should be equalized, while also suggesting a reason for this deviation. In particular, our results shed new light on the debate about the role of traditional values in a modernizing society characterized by relatively high economic growth. The regressions in Tables 9 and 10 are suggestive about how the relatively traditional and tightly-knit society of the Kagera Region reacted to growing economic opportunities in the past decade. In this section we build a narrative around these results in three steps. First, we argue that there are windows of opportunity that arise over time and space in the region and people need to move in order to take advantage of these opportunities. Second, we explain how social norms can prevent some people from moving. Finally we argue why such welfare-

reducing constraints may be imposed by society on its members, thus providing an answer to the question of why not more people move if pay-offs are so high.

The economic landscape in the Kagera Region, as in other regions in Africa, has been changing in the last two decades. Growth opportunities are continually being introduced and eliminated across time and space, as the refugee crisis abates, links with war-ridden bordering countries change and more localized negative and positive shocks manifest themselves with various degrees of severity. People need to be physically (geographically) mobile in order to respond to them. To elaborate on this point, we unpacked the results of Table 9 further to examine the role of where one moves (more or less remote areas) and moves associated with sector changes (i.e. out of agriculture into non-agricultural activities). Table 11 disaggregates the migration variable into three categories of migration (moving to a more or less connected or urbanized area). Even moving to a less-connected area is still correlated with higher growth compared to not moving, but moving to a more-connected area results in consumption growth that is 66 percentage points higher than with for no move. The same result is found using distance of move in the second column. While where one moves matters for the magnitude of the effect, any movement has the potential to be welfare improving.

In Table 12, we interact migration with change in sector (out of agriculture). We pool people who moved out of agriculture and those who remained in non-agriculture; both groups had statistically indistinguishable findings in all regressions. The first column shows that moving out of agriculture is strongly linked to higher consumption growth (as noted above in the descriptive statistics). There is a large and positive impact of moving out of agriculture (and remaining in non-agriculture), as well as a strong interactive effect of this sector shift with physical movement out of the village. In other words, it is not just the move out of agriculture that accounts for the large growth differential, but migration as physical movement out of the village has strong additional and complementary effects.

Tables 11 and 12 thus show that movement in itself is important. A logical – for economists perhaps even tautological – consequence of this is that constraints to movement are impediments to growth for whomever they happen to constrain. The regressions clearly show that one needs to be in a position to move in order to take advantage of geographic- and time-specific economic opportunities, while at the same time there are a number of crucial social constraints in place that may prevent one from doing so. We identify the effects of moving from the baseline household and our results point to a number of interacting factors that constrain movement, but do not, except through this constraint, affect productivity. The analysis largely points to social and family norms interacting with pull (nearby towns) and push

(shocks) factors as determinants of who can be allowed (or is chosen) to move. Our first stage regressions show how people in their teens and twenties, with weaker ties to the household in which they live, unmarried and male have more freedom to take advantage of the windows of opportunity that come their way. If there is a shock or if a town is nearby, it may not be acceptable for a young woman to move alone in response to this. For a young man this may seem acceptable or safe, and not jeopardize, for example, future marriage possibilities. Similarly, being head or spouse of head will typically imply local responsibilities which make it harder to leave. Remember that our claim to validity of the instruments comes exactly from the assertion that, while they may be relevant to explaining growth in an additive way, the interaction between them (i.e. the interaction of these push and pull factors with social constraints) is not.

Taken together this suggests that there are windows of opportunity – being in the right place at the right time – that certain categories of people can take advantage of: not having social and family constraints in a window of time when physical mobility has large pay-offs. Missing these windows implies remaining trapped in a low-return environment. But this still begs the question of why we do not see more migration given these high returns, and why these barriers remain in place if they are so welfare-reducing. Our results may reflect the literature which links network externalities to poverty traps, and so endogenizes exit barriers in the village. In Hoff and Sen (2005) the kinship group decides how high to set the exit barrier for its members. They start from the observation that kin members who have moved and remain loyal to their kinship group at home will sometimes need to undertake actions with negative consequences for their employers (securing jobs for kin) or landlords (sharing housing), etc. This creates an entry-barrier for anyone with obvious strong kinship ties to their home-village. In order to overcome such entry-barriers a kin member may have to sever ties with his or her kin-group, implying the loss of a productive element (from the kin-group's point of view). To avoid this *ex-ante*, the kin-group may decide to manipulate exit-barriers – raising them through social norms about migration in order not to lose productive members. Their model finds that it can be in the interest of the kinship group to prevent some of its members to take advantage of economic opportunities.

Our results offer an empirical qualification of this basic result and suggest that these exit barriers are not equal over time as they depend on interactions between someone's gender, age, age-rank, and degree of connectedness to the household head. Furthermore our results suggest that these exit barriers are only binding constraints when geographic- and time-specific push or pull factors offer a window for economic advancement through migration.

9. Conclusion

This paper explores the impact of migration on poverty and living standards in Tanzania. We use unique panel data covering 13 years from a region in Tanzania which tracked migrant individuals. Assessing the impact of migration on living standards is particularly difficult, since we cannot observe someone to be a migrant and remain in the original community at the same time. A relatively simple difference-in-difference model is used to assess the impact of migration on consumption levels, thereby controlling for fixed individual heterogeneity in determining the level of consumption. Furthermore, we can identify the impact of migration on the growth rate of consumption using within-household variation in subsequent migration of individual members. This initial household fixed effects estimator controls for unobserved heterogeneity in the growth rate of consumption common with among baseline household members. Finally, a number of specific individual factors are added as controls, and IV estimates are also presented.

The findings are remarkably large and robust: migrants experienced 36 percent higher consumption growth compared to those who stayed behind. We also find that transfers from migrants to non-migrating members are relatively limited. We find suggestive evidence that it matters where one moves. Moving to more connected areas has substantially higher returns, but even moving to a less connected area from where one was initially is correlated with higher growth. Also, moving into non-agricultural activities contributes to consumption growth. Yet, whatever the activity/sector, moving in itself always offers higher returns than the growth observed for anyone moving or staying in a particular sector.

Relative to the theory, the paper offers evidence consistent with features in the original Lewis model, with persistent wage differentials, at least at this stage of the rural transformation.[7] Relative to the 'new economics of migration', the evidence is less conclusive. The fact that there is a robust difference in welfare levels between those who migrated and those who did not is not consistent with either complete altruism or risk-sharing, although it is possible that the results reflect partial risk-sharing and some transfers. We offer suggestive evidence that some transfers are indeed occurring, but they are relatively limited from those who migrated long distances. As we do not attempt to offer a structural model of migration (only a first stage in a 2SLS procedure), our evidence does not shed full light on the migration process. However, we have suggestive evidence that within-family social structures matter to who gets the opportunities to migrate, how far they go, and who, therefore, can move up economically in Tanzania. This evidence also helps us to understand better how our results relate to the predictions in the Harris-

[7] This interpretation of Lewis (1954) is still debated, and not necessarily a feature of subsequent dual economy models. For a discussion, see Fields (2004).

Todaro model. Unlike the equilibrium conditions in Harris-Todaro, on average the premium on migration is positive and rather large: in expectations earnings do not appear to be equalized, suggesting imperfect labor market integration, or, in terms of the Harris-Todaro model, that equilibrium has not been obtained and returns to migration remain high. Barriers appear to exist to physical movement, and these barriers keep returns unexploited. Our evidence suggested that, just as in Hoff and Sen (2005), some of these barriers may be exit-barriers that result is less than efficient levels of migration.

Figure 1: KHDS 2004: Recontacting Respondents after 10+ years*

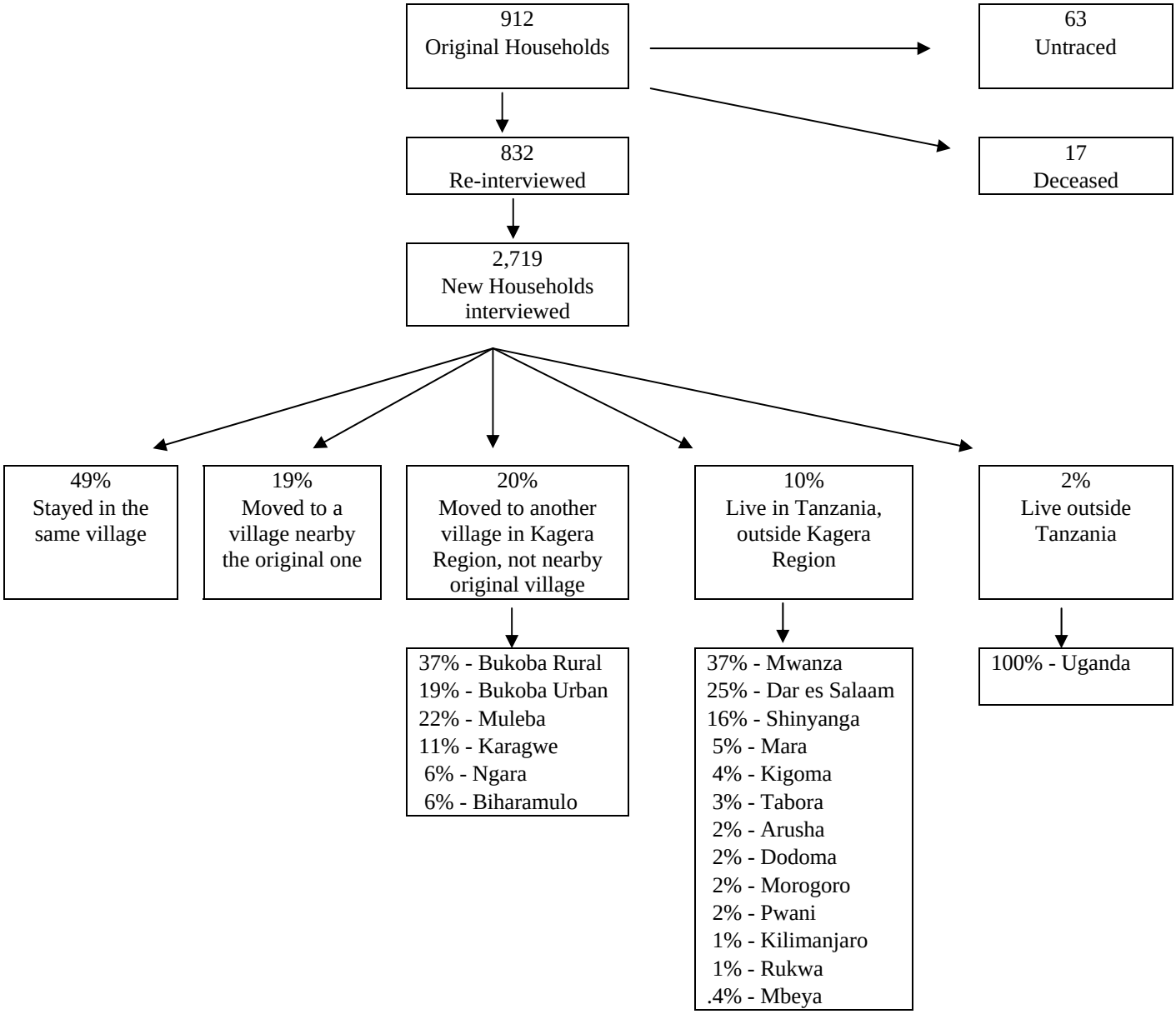
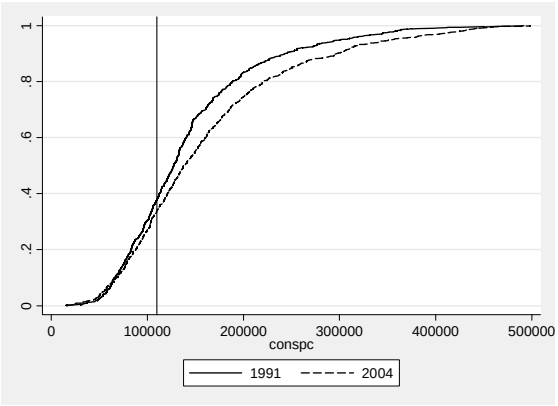
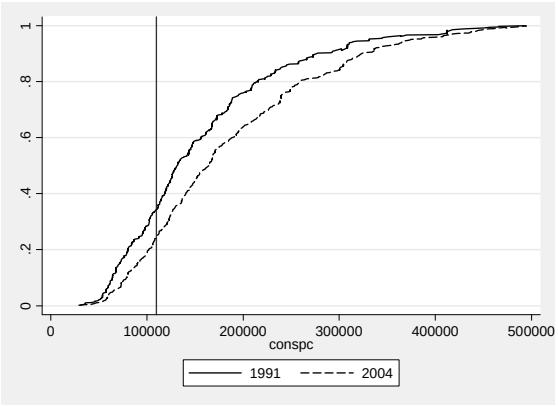


Figure 2: Cumulative Density Functions Consumption per Capita (truncated at TZS 500,000)

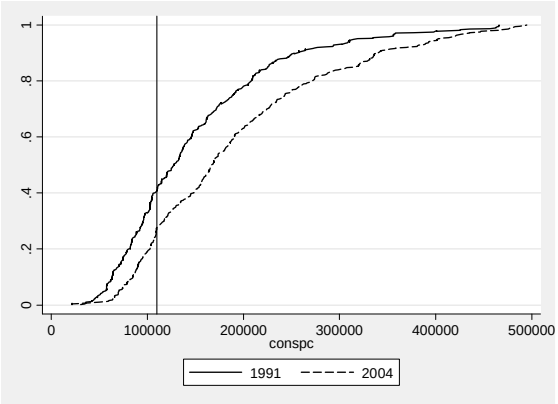
PANEL A: Within Community (*N*=2447)



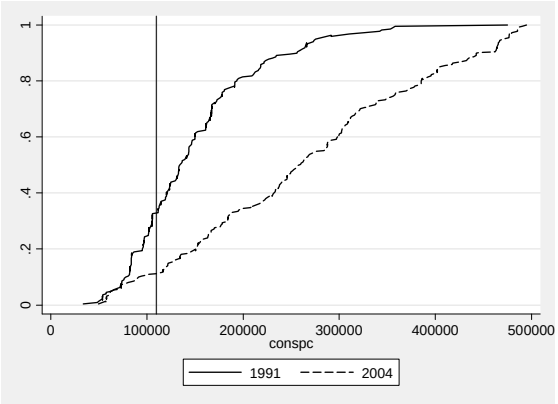
PANEL B: Nearby Community(*N*=509)



PANEL C: Elsewhere in Kagera (*N*=489)



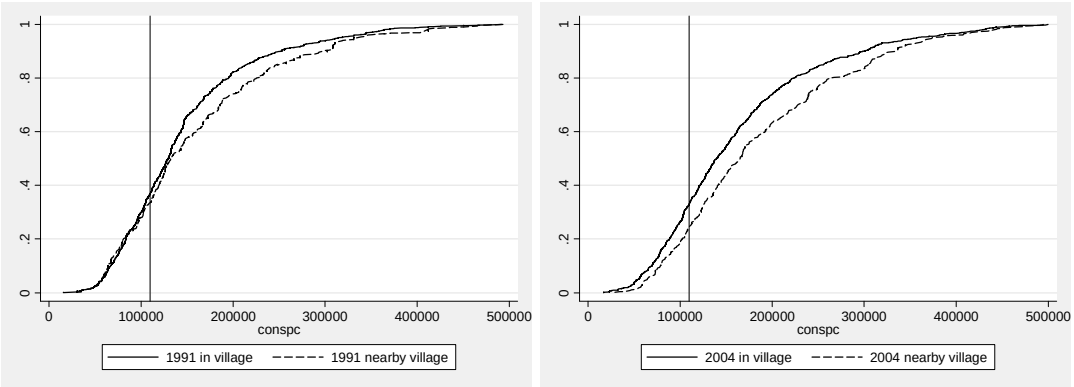
PANEL D: Outside Kagera (*N*=221)



Note: vertical line is the basic needs poverty line (TZS 109,663).

Figure 3: Cumulative Density Functions Consumption per Capita within community vs. nearby community (truncated at TZS 500,000)

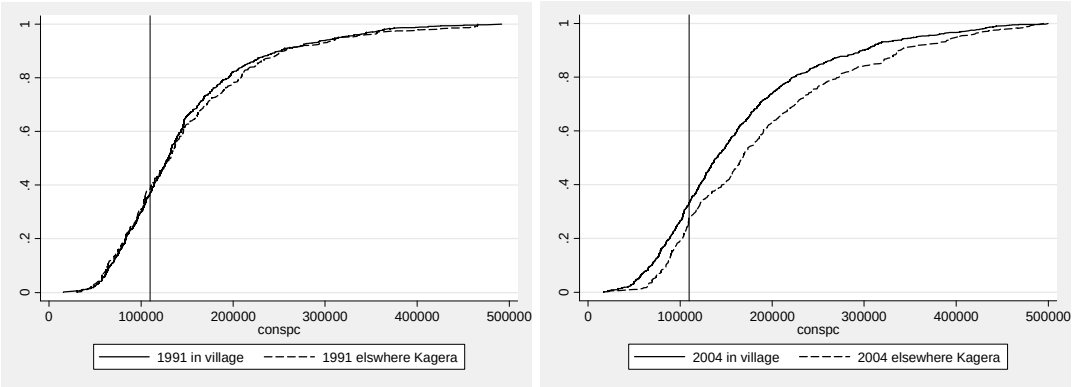
PANEL A: 1991 PANEL B: 2004



Note: vertical line is the basic needs poverty line (TZS 109,663).

Figure 4: Cumulative Density Functions Consumption per Capita within community vs. elsewhere Kagera (truncated at TZS 500,000)

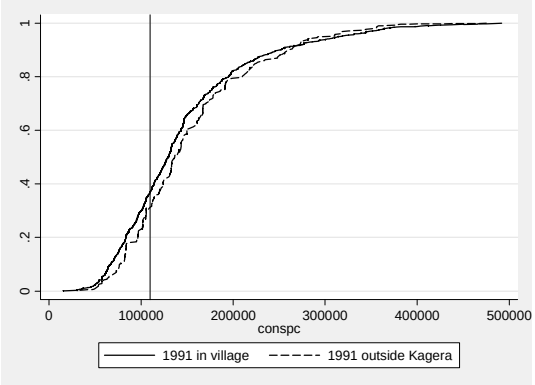
PANEL A: 1991 PANEL B: 2004



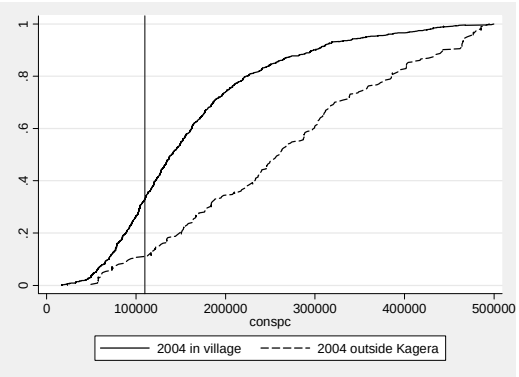
Note: vertical line is the basic needs poverty line (TZS 109,663).

Figure 5: Cumulative Density Functions Consumption per Capita within community vs. outside Kagera (truncated at TZS 500,000)

PANEL A: 1991



PANEL B: 2004



Note: vertical line is the basic needs poverty line (TZS 109,663).

Table 1: KHDS Individuals, by Age

Age at baseline 1991-1994	Recontacted		Deceased		Untraced		Reinterview rate among survivors
<10 years	1,604	(77.1%)	160	(7.7%)	317	(15.2%)	83.5%
10-19 years	1,406	(73.2%)	104	(5.4%)	412	(21.4%)	77.3%
20-39 years	823	(63.3%)	285	(22.1%)	190	(14.6%)	81.2%
40-59 years	436	(70.6%)	147	(23.9%)	34	(5.5%)	92.8%
60+ years	163	(37.6%)	262	(60.4%)	9	(2.1%)	94.8%
Overall	4,432	(69.7%)	958	(15.1%)	962	(15.1%)	82.2%

Notes: Sample of individuals ever interviewed in KHDS 1991-1994 and alive at last interview. Age categories are based on age at first interview.

Table 2: KHDS Reinterview Rates by Location

	Number	Location	%
Baseline sample	6,355		
Reinterviewed	4,432		
		Same community	63.1
		Nearby community	14.1
		Elsewhere in Kagera	14.4
		Other region	7.1
		Other country	1.3
Untraced	962		
		Kagera	56.6
		Dar es Salaam	12.3
		Mwanza	10.4
		Other region	7.9
		Other country	5.5
		Don't know	7.3
Deceased	958		

Notes: Location for untraced respondents is reported by other household members from the baseline survey who were successfully located, interviewed, and able to provide location information on the respondent. In some cases, this information comes from other relatives or neighbors residing in the baseline communities.

Table 3: Average Consumption Movements of Panel Respondents, by 2004 location

	mean 1991	Mean 2004	difference means	N
Consumption Poverty Headcount (%)				
Full Sample	0.34	0.27	-0.07***	4116
Within community	0.35	0.31	-0.03***	2620
Nearby community	0.33	0.21	-0.11***	577
Elsewhere in Kagera	0.36	0.24	-0.12***	595
Out of Kagera	0.30	0.07	-0.23***	324
Consumption per capita (Tsh)				
Full Sample	164,434	226,337	61,903***	4116
Within community	159,959	186,474	26,515***	2620
Nearby community	171,493	234,973	63,480***	577
Elsewhere in Kagera	167,597	260,749	93,152***	595
Out of Kagera	180,707	472,474	291,767***	324
Food consumption per capita (Tsh)				
Full Sample	106,805	146,701	39,896***	4116
Within community	104,184	121,725	17,541***	2620
Nearby community	111,207	152,624	41,417***	577
Elsewhere in Kagera	108,763	166,379	57,616***	595
Out of Kagera	115,704	303,453	187,749***	324
Non-Food consumption per capita (Tsh)				
Full Sample	57,629	79,636	22,007***	4116
Within community	55,775	64,748	8,973***	2620
Nearby community	60,286	82,348	22,062***	577
Elsewhere in Kagera	58,834	94,369	35,535***	595
Out of Kagera	65,003	169,021	107,018***	324

Notes: Significance of the difference with the 1991 value using a paired *t*-test. *=10% **=5% ***=1% ns=not significant.

Table 4: Differences in Consumption and Poverty Head Count Changes by Mobility Categories

	N	Average Change	t-test for equality change between both subgroups
Consumption per Capita (Tsh)			
Stayed in community	2,620	25,940	t =13.93
Moved elsewhere	1,496	120,534	p=0.0000
Stayed in same or neighboring community	3,197	31,432	t=16.67
Moved elsewhere	919	160,820	p=0.0000
Stayed in Kagera Region	3,792	41,460	t=20.25
Moved elsewhere	324	281,064	p=0.000
Poverty Head Count (%)			
Stayed in community	2,620	-0.034	t=5.41
Moved elsewhere	1,496	-0.140	p=0.000
Stayed in same or neighboring community	3,197	-0.047	t=5.11
Moved elsewhere	919	-0.162	p=0.000
Stayed in Kagera Region	3,792	-0.059	t=4.94
Moved elsewhere	324	-0.231	p=0.000

Table 5: Sample Size, Means, Standard Errors and 95% Confidence Intervals for Incremental Samples

		N	mean	SE	95% CI	
Change in Consumption per Capita (Tsh)						
(1)	Only those who remained in community	2,620	25,940	3,057	19,945	31,935
(2)	(1) + those who moved to neighboring communities	3,197	31,432	2,878	25,790	37,074
(3)	(2) + those who moved elsewhere within Kagera Region	3,792	41,460	2,985	35,609	47,312
(4)	(3) + those who moved outside Kagera Region (=full sample)	4,061	56,392	3,259	50,003	62,782
Change in Poverty Head Count (%)						
(1)	Only those who remained in community	2,620	-0.034	0.012	-0.058	-0.010
(2)	(1) + those who moved to neighboring communities	3,197	-0.047	0.011	-0.068	-0.025
(3)	(2) + those who moved elsewhere within Kagera Region	3,792	-0.059	0.010	-0.078	-0.039
(4)	(3) + those who moved outside Kagera Region (=full sample)	4,061	-0.068	0.009	-0.087	-0.049

Table 6: Mean and Median Consumption Growth by Move to More or Less Remote Areas 1991-2004

	Mean	Median	N
Did not move	0.13	0.16	2,147
Move out of community	0.53	0.50	1,080
Out of those that moved out of community:			
Move to more remote area	0.28	0.21	380
Move to similar area	0.46	0.45	378
Move to less remote area	0.90	0.86	322

Notes: Remoteness is based on the changes in classification among 6 possibilities, in order of remoteness, island in Lake Victoria, remote village, connected village, urban center, district capital, regional capital.

Table 7: Mean and Median Consumption Growth by Sectoral Allocation Change 1991-2004

	Mean	Median	N
Stay in Agriculture	0.21	0.22	1,721
Move out of Agriculture into Non-Agriculture	0.69	0.67	408
Stay in Non-Agriculture	0.43	0.43	172
Move into Agriculture from Non-Agriculture	-0.05	-0.03	245
Total	0.28	0.27	2,546

Table 8: Mean Consumption Growth by Sectoral Allocation and by Physical Movement 1991-2004

	Stayed in Community	Moved out of Community	All
Stay in Agriculture	0.18	0.29	0.22
	(1,248)	(473)	(1,721)
Move out of Agriculture into Non-Agriculture	0.42	1.04	0.67
	(201)	(207)	(408)
Stay in Non-Agriculture	0.11	0.88	0.44
	(88)	(84)	(172)
Move into Agriculture from Non-Agriculture	-0.12	-0.00	-0.03
	(157)	(88)	(245)
Total	0.18	0.49	0.27
	(1,697)	(857)	(2,546)

Table 9: Explaining Consumption Change - IHHFE & 2SLS with IHHFE

	(1)	(2)	(3)	(4)
	IHHFE	IHHFE	2SLS with IHHFE	2SLS with IHHFE
Moved outside community	0.363***		0.378**	
	(0.025)		(0.150)	
Kms moved (log of distance)		0.120***		0.104**
		(0.006)		(0.043)
Individual characteristics at baseline				
Deviation of years schooling from peers	0.013**	0.009	0.013**	0.010
	(0.006)	(0.006)	(0.006)	(0.006)
Squared deviation of years schooling from peers	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)
Male	-0.004	-0.009	-0.003	-0.010
	(0.038)	(0.037)	(0.038)	(0.037)
Unmarried	-0.023	-0.020	-0.027	-0.011
	(0.056)	(0.054)	(0.064)	(0.060)
Unmarried male	0.141***	0.131***	0.144***	0.123**
	(0.045)	(0.044)	(0.053)	(0.049)
Both parents died	-0.006	0.013	-0.006	0.010
	(0.084)	(0.081)	(0.083)	(0.082)
Above 15 & both parents died	0.050	0.024	0.048	0.033
	(0.100)	(0.098)	(0.101)	(0.100)
Years of education mother	-0.003	-0.004	-0.003	-0.003
	(0.006)	(0.005)	(0.006)	(0.006)
Years of education father	0.008*	0.007	0.008*	0.007
	(0.005)	(0.005)	(0.005)	(0.005)
Biological children residing in HH at baseline				
Male children 0-5	-0.028	-0.029	-0.028	-0.028
	(0.031)	(0.030)	(0.030)	(0.030)
Female children 0-5	-0.027	-0.024	-0.027	-0.025
	(0.030)	(0.029)	(0.030)	(0.029)
Male children 6-10	0.009	0.014	0.009	0.014
	(0.035)	(0.034)	(0.035)	(0.034)
Female children 6-10	-0.045	-0.056	-0.046	-0.055
	(0.038)	(0.037)	(0.037)	(0.037)
Male children 11-15	0.012	0.017	0.012	0.016
	(0.036)	(0.035)	(0.036)	(0.035)
Female children 11-15	-0.000	-0.006	-0.000	-0.007
	(0.035)	(0.034)	(0.035)	(0.034)
Male children 16-20	0.010	0.001	0.010	0.001
	(0.041)	(0.040)	(0.041)	(0.040)
Female children 16-20	-0.085*	-0.093**	-0.085*	-0.094**
	(0.044)	(0.043)	(0.044)	(0.043)
Male children 21+	0.033	0.026	0.033	0.028
	(0.045)	(0.044)	(0.045)	(0.044)
Female children 21+	-0.073	-0.094*	-0.072	-0.094*
	(0.055)	(0.054)	(0.055)	(0.054)

	(1)	(2)	(3)	(4)
	IHHFE	IHHFE	2SLS with IHHFE	2SLS with IHHFE
Number of children residing outside HH	-0.000	0.002	-0.000	0.001
	(0.011)	(0.011)	(0.011)	(0.011)
Km from regional capital *	0.000	0.000	0.000	0.000
number outside children	(0.000)	(0.000)	(0.000)	(0.000)
Age at baseline (1991-1994)				
5-15 years	0.143***	0.139***	0.140***	0.149***
	(0.030)	(0.029)	(0.043)	(0.040)
16-25 years	0.059	0.059	0.056	0.069
	(0.039)	(0.038)	(0.049)	(0.045)
26-35 years	0.108*	0.105*	0.107*	0.108*
	(0.065)	(0.063)	(0.065)	(0.063)
36-45 years	0.132*	0.130*	0.130	0.135*
	(0.080)	(0.078)	(0.081)	(0.079)
46-55 years	0.149	0.163*	0.148	0.164*
	(0.091)	(0.088)	(0.090)	(0.088)
56-65 years	0.118	0.123	0.118	0.124
	(0.098)	(0.096)	(0.098)	(0.095)
66+ years	0.180	0.168	0.179	0.172
	(0.121)	(0.118)	(0.120)	(0.118)
Constant	-0.023	-0.013		
	(0.064)	(0.063)		
Cragg-Donald			11.86	9.33
Sargan Statistic			6.26	7.28
Sargan p-value			0.28	0.20
Number of observations	3,227	3,227	3,227	3,227

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Table 10: First Stage Regressions of Table 9

	(1) Moved	(2) Distance moved
Baseline covariates: excluded instruments		
Head or spouse	-0.218***	-0.634***
	(0.038)	(0.147)
Child of head	-0.097***	-0.423***
	(0.032)	(0.123)
Male child of head	-0.114***	-0.334**
	(0.037)	(0.144)
Age rank in HH * age 5-15	14.390*	65.346*
	(8.003)	(30.884)
Km from reg. capital * male * age 5-15	-0.001***	-0.002**
	(0.000)	(0.001)
Average rainfall deviation * age 5-15	0.000**	0.001**
	(0.000)	(0.000)
Individual characteristics at baseline		
Deviation of years schooling from peers	0.012**	0.071***
	(0.005)	(0.018)
Squared deviation of years schooling from peers	0.003**	0.014***
	(0.001)	(0.004)
Male	-0.017	-0.010
	(0.030)	(0.116)
Unmarried	0.137***	0.464**
	(0.048)	(0.187)
Unmarried male	-0.105**	-0.244
	(0.042)	(0.164)
Both parents died	-0.029	-0.261
	(0.066)	(0.253)
Above 15 & both parents died	0.113	0.562*
	(0.079)	(0.304)
Years of education mother	0.012***	0.040**
	(0.004)	(0.017)
Years of education father	-0.002	-0.000
	(0.004)	(0.015)
Biological children residing in HH at baseline		
Male children 0-5	-0.001	0.008
	(0.024)	(0.093)
Female children 0-5	-0.001	-0.010
	(0.024)	(0.092)
Male children 6-10	-0.001	-0.059
	(0.028)	(0.107)
Female children 6-10	-0.006	0.038
	(0.030)	(0.116)
Male children 11-15	-0.011	-0.083
	(0.028)	(0.110)
Female children 11-15	-0.035	-0.077
	(0.027)	(0.105)

	(1) Moved	(2) Distance moved
Male children 16-20	-0.022	-0.006
	(0.032)	(0.125)
Female children 16-20	-0.031	-0.036
	(0.035)	(0.134)
Male children 21+	0.020	0.127
	(0.036)	(0.137)
Female children 21+	-0.016	0.127
	(0.044)	(0.169)
Number of children residing outside HH	-0.008	-0.043
	(0.009)	(0.033)
Km from regional capital * number outside children	0.000**	0.001**
	(0.000)	(0.000)
Age at baseline (1991-1994)		
5-15 years	0.284***	0.886***
	(0.054)	(0.210)
16-25 years	0.206***	0.603***
	(0.031)	(0.118)
26-35 years	0.079	0.246
	(0.051)	(0.198)
36-45 years	0.135**	0.403*
	(0.063)	(0.243)
46-55 years	0.079	0.095
	(0.071)	(0.276)
56-65 years	0.046	0.068
	(0.078)	(0.300)
66+ years	0.056	0.246
	(0.095)	(0.366)
Number of observations	3,227	3,227

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%. Linear probability model (column 1) and OLS (column 2) with household fixed effects.

Table 11: Explaining Consumption Change – IHHFE, characteristics of the move

	(1) IHHFE	(2) IHHFE
Characteristics of the move		
Move to more remote area	0.176***	
	(0.036)	
Move to similar area	0.098**	
	(0.044)	
Move to more connected area	0.485***	
	(0.047)	
Km moved		0.073***
		(0.011)
Distance moved if to similar area		0.032**
		(0.015)
Distance moved if to more connected area		0.070***
		(0.013)
Individual characteristics at baseline		
Deviation of years schooling from peers	0.010*	0.008
	(0.006)	(0.006)
Squared deviation of years schooling	0.004***	0.004***
from peers	(0.001)	(0.001)
Male	-0.004	-0.008
	(0.037)	(0.037)
Unmarried	-0.008	-0.006
	(0.054)	(0.054)
Unmarried male	0.127***	0.121***
	(0.044)	(0.043)
Both parents died	0.005	0.025
	(0.082)	(0.081)
Above 15 & both parents died	0.053	0.020
	(0.098)	(0.097)
Years of education mother	-0.004	-0.004
	(0.005)	(0.005)
Years of education father	0.006	0.006
	(0.005)	(0.005)
Biological children residing in HH at baseline		
Male children 0-5	-0.021	-0.023
	(0.030)	(0.030)
Female children 0-5	-0.026	-0.025
	(0.029)	(0.029)
Male children 6-10	0.008	0.015
	(0.034)	(0.034)
Female children 6-10	-0.048	-0.056
	(0.037)	(0.036)
Male children 11-15	0.023	0.022
	(0.035)	(0.035)
Female children 11-15	-0.010	-0.011
	(0.034)	(0.033)
Male children 16-20	0.012	0.002

	(1) IHHFE	(2) IHHFE
	(0.040)	(0.040)
Female children 16-20	-0.085*	-0.095**
	(0.043)	(0.043)
Male children 21+	0.023	0.020
	(0.044)	(0.044)
Female children 21+	-0.090*	-0.099*
	(0.054)	(0.054)
Number of children residing outside HH	-0.001	0.003
	(0.011)	(0.011)
Km from regional capital *	0.000	0.000
number outside children	(0.000)	(0.000)
Age at baseline (1991-1994)		
5-15 years	0.141***	0.143***
	(0.029)	(0.028)
16-25 years	0.063*	0.066*
	(0.038)	(0.038)
26-35 years	0.107*	0.102
	(0.063)	(0.063)
36-45 years	0.130*	0.131*
	(0.078)	(0.077)
46-55 years	0.164*	0.166*
	(0.088)	(0.088)
56-65 years	0.135	0.127
	(0.096)	(0.095)
66+ years	0.190	0.169
	(0.118)	(0.117)
Constant	-0.015	-0.007
	(0.063)	(0.062)
Number of observations	3,227	3,227

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Table 12: Explaining Consumption Change – IHHFE, moving out of agriculture

	(1) IHHFE	(2) IHHFE	(3) IHHFE
Characteristics of the move			
Moved outside community		0.177***	
		(0.033)	
Moved out of agriculture	0.407***		
	(0.034)		
Kms moved (log of distance)			0.064***
			(0.011)
Moved outside community & out of agriculture		0.559***	
		(0.045)	
Distance moved * moved out of agriculture			0.112***
			(0.013)
Individual characteristics at baseline			
Deviation of years schooling from peers	0.013*	0.012*	0.011*
	(0.007)	(0.006)	(0.006)
Squared deviation of years schooling	0.004**	0.003**	0.003**
from peers	(0.002)	(0.001)	(0.001)
Male	-0.059	-0.004	-0.007
	(0.042)	(0.040)	(0.040)
Unmarried	-0.005	-0.052	-0.035
	(0.063)	(0.061)	(0.061)
Unmarried male	0.079	0.126**	0.130***
	(0.051)	(0.050)	(0.050)
Both parents died	-0.066	-0.048	-0.024
	(0.113)	(0.108)	(0.108)
Above 15 & both parents died	0.110	0.078	0.045
	(0.126)	(0.121)	(0.120)
Years of education mother	0.005	-0.002	-0.005
	(0.007)	(0.007)	(0.007)
Years of education father	-0.003	0.002	0.002
	(0.006)	(0.006)	(0.006)
Biological children residing in HH at baseline			
Male children 0-5	-0.048	-0.047	-0.042
	(0.035)	(0.034)	(0.034)
Female children 0-5	-0.029	-0.018	-0.020
	(0.034)	(0.033)	(0.033)
Male children 6-10	0.023	0.013	0.025
	(0.039)	(0.038)	(0.037)
Female children 6-10	-0.057	-0.055	-0.066
	(0.043)	(0.041)	(0.041)
Male children 11-15	0.018	0.006	0.020
	(0.041)	(0.039)	(0.039)
Female children 11-15	0.004	0.007	0.004
	(0.039)	(0.037)	(0.037)
Male children 16-20	-0.024	-0.019	-0.010
	(0.046)	(0.044)	(0.044)

	(1) IHHFE	(2) IHHFE	(3) IHHFE
Female children 16-20	-0.100**	-0.107**	-0.118**
	(0.049)	(0.047)	(0.047)
Male children 21+	0.027	0.018	0.008
	(0.053)	(0.051)	(0.050)
Female children 21+	-0.141**	-0.101	-0.110*
	(0.067)	(0.064)	(0.064)
Number of children residing outside HH	0.006	0.002	0.003
	(0.013)	(0.012)	(0.012)
Km from regional capital *	0.000	0.000	0.000
number outside children	(0.000)	(0.000)	(0.000)
Age at baseline (1991-1994)			
5-15 years	0.177***	0.135***	0.141***
	(0.049)	(0.047)	(0.047)
16-25 years	0.058	0.039	0.043
	(0.057)	(0.055)	(0.054)
26-35 years	0.063	0.095	0.096
	(0.083)	(0.079)	(0.079)
36-45 years	0.077	0.099	0.095
	(0.098)	(0.094)	(0.094)
46-55 years	0.103	0.135	0.141
	(0.110)	(0.106)	(0.105)
56-65 years	0.091	0.106	0.114
	(0.119)	(0.115)	(0.114)
66+ years	0.195	0.260*	0.248*
	(0.156)	(0.149)	(0.149)
Constant	0.084	0.055	0.058
	(0.082)	(0.079)	(0.079)
Number of observations	2,546	2,546	2,546

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Appendix Table 1: Sample Means

	Mean	SD
Change in (logged) Consumption per Capita	0.26	(0.77)
Moved	0.34	(0.47)
Distance moved (kms)	35.02	(145.01)
Distance moved variable: log(kms+1)	1.06	(1.78)
Baseline covariates: excluded instruments		
Head or spouse	0.26	(0.44)
Child of head	0.49	(0.50)
Male child of head	0.25	(0.43)
Age rank in HH * age 5-15	0.00	(0.00)
Km from reg. capital * male * age 5-15	12.04	(38.43)
Average rainfall deviation * age 5-15	-185.09	(287.11)
Individual characteristics at baseline		
Deviation of years schooling from peers	-0.25	(2.24)
Squared deviation of years schooling from peers	5.08	(9.50)
Male	0.47	(0.50)
Unmarried	0.69	(0.46)
Unmarried male	0.36	(0.48)
Both parents died	0.05	(0.22)
Above 15 & both parents died	0.02	(0.15)
Years of education mother	2.72	(3.02)
Years of education father	4.23	(3.32)
Biological children residing in HH at baseline		
Male children 0-5	0.15	(0.45)
Female children 0-5	0.14	(0.45)
Male children 6-10	0.10	(0.36)
Female children 6-10	0.09	(0.34)
Male children 11-15	0.10	(0.36)
Female children 11-15	0.11	(0.38)
Male children 16-20	0.06	(0.29)
Female children 16-20	0.06	(0.28)
Male children 21+	0.05	(0.26)
Female children 21+	0.04	(0.21)
Number of children residing outside HH	0.64	(1.83)
Km from regional capital * number outside children	44.62	(184.60)
Age at baseline (1991-1994)		
5-15 years	0.35	(0.48)
16-25 years	0.20	(0.40)
26-35 years	0.08	(0.27)
36-45 years	0.07	(0.26)
46-55 years	0.06	(0.23)
56-65 years	0.04	(0.20)
66+ years	0.02	(0.12)
Number of observations	3,227	

Appendix Table 2: Explaining Consumption Change - IHHFE & 2SLS, Household-level results

	(1) IHHFE	(2) IHHFE	(3) 2SLS	(4) 2SLS
Moved outside community	0.321***		0.520***	
	(0.038)		(0.154)	
Kms moved (log of distance)		0.112***		0.146***
		(0.009)		(0.045)
Individual characteristics at baseline				
Deviation of years schooling from peers	0.013	0.007	0.011	0.005
	(0.010)	(0.010)	(0.010)	(0.010)
Squared deviation of years schooling from peers	0.006***	0.006***	0.006***	0.005**
	(0.002)	(0.002)	(0.002)	(0.002)
Male	0.085	0.067	0.115	0.076
	(0.096)	(0.093)	(0.098)	(0.093)
Unmarried	-0.114	-0.117	-0.144	-0.132
	(0.101)	(0.098)	(0.104)	(0.100)
Unmarried male	0.179*	0.182*	0.208**	0.197**
	(0.102)	(0.099)	(0.104)	(0.101)
Both parents died	-0.079	-0.042	-0.080	-0.032
	(0.136)	(0.133)	(0.136)	(0.133)
Above 15 & both parents died	0.124	0.066	0.092	0.034
	(0.175)	(0.171)	(0.177)	(0.175)
Years of education mother	-0.004	-0.006	-0.008	-0.009
	(0.010)	(0.009)	(0.010)	(0.010)
Years of education father	0.016*	0.015*	0.017*	0.015*
	(0.009)	(0.009)	(0.009)	(0.009)
Biological children residing in HH at baseline				
Male children 0-5	-0.049	-0.042	-0.049	-0.040
	(0.074)	(0.072)	(0.074)	(0.072)
Female children 0-5	0.014	0.019	0.040	0.034
	(0.078)	(0.076)	(0.081)	(0.078)
Male children 6-10	-0.112	-0.097	-0.101	-0.087
	(0.090)	(0.087)	(0.090)	(0.088)
Female children 6-10	-0.181*	-0.209**	-0.179*	-0.216**
	(0.090)	(0.088)	(0.090)	(0.088)
Male children 11-15	0.046	0.051	0.042	0.051
	(0.076)	(0.074)	(0.076)	(0.073)
Female children 11-15	-0.046	-0.045	-0.018	-0.031
	(0.083)	(0.081)	(0.086)	(0.082)
Male children 16-20	0.040	0.024	0.054	0.026
	(0.088)	(0.086)	(0.089)	(0.085)
Female children 16-20	-0.200**	-0.214**	-0.174*	-0.206**
	(0.105)	(0.102)	(0.107)	(0.102)
Male children 21+	0.046	0.041	0.035	0.035
	(0.105)	(0.102)	(0.105)	(0.102)
Female children 21+	-0.204	-0.237*	-0.166	-0.229*
	(0.126)	(0.122)	(0.129)	(0.122)
Number of children residing outside HH	-0.001	0.001	-0.004	0.000

	(1) IHHFE	(2) IHHFE	(3) 2SLS	(4) 2SLS
	(0.022)	(0.021)	(0.022)	(0.021)
Km from regional capital *	0.000	0.000	0.000	0.000
number outside children	(0.000)	(0.000)	(0.000)	(0.000)
Age at baseline (1991-1994)				
5-15 years	0.245***	0.246***	0.215***	0.229***
	(0.062)	(0.060)	(0.066)	(0.063)
16-25 years	0.060	0.066	0.047	0.058
	(0.071)	(0.069)	(0.072)	(0.069)
26-35 years	0.152	0.160	0.196	0.183
	(0.131)	(0.127)	(0.135)	(0.130)
36-45 years	0.141	0.167	0.155	0.161
	(0.168)	(0.163)	(0.168)	(0.163)
46-55 years	0.206	0.264	0.278	0.312*
	(0.187)	(0.182)	(0.194)	(0.193)
56-65 years	0.144	0.180	0.243	0.231
	(0.199)	(0.193)	(0.212)	(0.206)
66+ years	0.336	0.344	0.384*	0.357
	(0.236)	(0.229)	(0.238)	(0.230)
Constant	0.025	0.019		
	(0.129)	(0.125)		
Cragg-Donald			13.68	9.10
Sargan Statistic			5.67	7.76
Sargan p-value			0.34	0.17
Number of observations	1,909	1,909	1,909	1,909

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Appendix Table 3: First Stage Regressions of Appendix Table 1

	(1) Moved	(2) Distance moved
Baseline covariates: excluded instruments		
Head or spouse	-0.179***	-0.480*
	(0.063)	(0.254)
Child of head	-0.058	-0.327*
	(0.048)	(0.193)
Male child of head	-0.157***	-0.467**
	(0.056)	(0.226)
Age rank in HH * age 5-15	-7.379	-17.046
	(12.036)	(48.292)
Km from reg. capital * male * age 5-15	-0.001*	-0.001
	(0.000)	(0.001)
Average rainfall deviation * age 5-15	0.001***	0.002***
	(0.000)	(0.000)
Individual characteristics at baseline		
Deviation of years schooling from peers	0.007	0.070**
	(0.007)	(0.030)
Squared deviation of years schooling from peers	0.003**	0.018***
	(0.002)	(0.006)
Male	-0.126*	-0.233
	(0.070)	(0.282)
Unmarried	0.095	0.364
	(0.075)	(0.305)
Unmarried male	-0.022	-0.073
	(0.079)	(0.321)
Both parents died	0.019	-0.276
	(0.098)	(0.395)
Above 15 & both parents died	0.160	0.974**
	(0.125)	(0.506)
Years of education mother	0.015**	0.060**
	(0.007)	(0.028)
Years of education father	-0.010	-0.019
	(0.007)	(0.027)
Biological children residing in HH at baseline		
Male children 0-5	0.016	-0.011
	(0.053)	(0.215)
Female children 0-5	-0.082	-0.246
	(0.056)	(0.229)
Male children 6-10	-0.007	-0.162
	(0.065)	(0.262)
Female children 6-10	0.005	0.221
	(0.066)	(0.266)
Male children 11-15	0.037	0.045
	(0.055)	(0.223)
Female children 11-15	-0.087	-0.274
	(0.061)	(0.246)

	(1) Moved	(2) Distance moved
Male children 16-20	-0.061	-0.040
	(0.063)	(0.257)
Female children 16-20	-0.105	-0.169
	(0.075)	(0.304)
Male children 21+	0.063	0.239
	(0.075)	(0.305)
Female children 21+	-0.156*	-0.168
	(0.091)	(0.369)
Number of children residing outside HH	0.006	0.001
	(0.016)	(0.064)
Km from regional capital * number outside children	0.000**	0.001**
	(0.000)	(0.000)
Age at baseline (1991-1994)		
5-15 years	0.454***	1.351***
	(0.072)	(0.291)
16-25 years	0.032	0.046
	(0.052)	(0.209)
26-35 years	-0.227**	-0.745*
	(0.094)	(0.382)
36-45 years	-0.089	-0.389
	(0.121)	(0.489)
46-55 years	-0.340**	-1.512***
	(0.135)	(0.547)
56-65 years	-0.433***	-1.529***
	(0.144)	(0.581)
66+ years	-0.239	-0.727
	(0.170)	(0.687)
Number of observations	1,909	1,909

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

Appendix Table 4: Household size at baseline and follow-up, by mobility categories mean (median)

	Household size		Household size: adult equivalent		
	1991	2004	1991	2004	N
Same village	7.71	5.98	6.15	4.94	2,150
	(7.0)	(6.0)	(5.7)	(4.6)	
Neighboring community	8.20	4.93	6.59	3.87	400
	(7.0)	(5.0)	(5.9)	(3.4)	
Elsewhere in Kagera region	7.65	4.47	6.17	3.55	437
	(7.0)	(4.0)	(6.0)	(3.2)	
Outside Kagera	8.45	4.45	6.74	3.69	251
	(7.0)	(4.0)	(6.1)	(3.1)	

Notes: Adult equivalence is defined following the National Bureau of Statistics with varying weights by age and sex.

Appendix Table 5: Explaining Consumption Change - IHHFE & 2SLS
Adult equivalent Consumption (rather than per capita)

	(1) IHHFE	(2) IHHFE	(3) 2SLS with IHHFE	(4) 2SLS with IHHFE
Moved outside community	0.363***		0.426***	
	(0.024)		(0.143)	
Kms moved (log of distance)		0.117***		0.123***
		(0.006)		(0.041)
Individual characteristics at baseline				
Deviation of years schooling from peers	0.014**	0.010*	0.013**	0.010
	(0.006)	(0.006)	(0.006)	(0.006)
Squared deviation of years schooling from peers	0.004***	0.003**	0.004***	0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
Male	-0.010	-0.016	-0.008	-0.016
	(0.036)	(0.035)	(0.036)	(0.035)
Unmarried	0.043	0.048	0.030	0.045
	(0.053)	(0.051)	(0.060)	(0.057)
Unmarried male	0.087**	0.076*	0.099*	0.079*
	(0.043)	(0.041)	(0.051)	(0.046)
Both parents died	0.007	0.026	0.009	0.027
	(0.079)	(0.077)	(0.079)	(0.077)
Above 15 & both parents died	0.032	0.008	0.026	0.005
	(0.095)	(0.093)	(0.096)	(0.095)
Years of education mother	-0.002	-0.003	-0.003	-0.003
	(0.005)	(0.005)	(0.006)	(0.006)
Years of education father	0.008*	0.007	0.008*	0.007
	(0.005)	(0.005)	(0.005)	(0.005)
Biological children residing in HH at baseline				
Male children 0-5	-0.041	-0.041	-0.041	-0.041
	(0.029)	(0.028)	(0.029)	(0.028)
Female children 0-5	-0.027	-0.025	-0.027	-0.024
	(0.028)	(0.028)	(0.028)	(0.028)
Male children 6-10	0.001	0.005	0.000	0.006
	(0.033)	(0.032)	(0.033)	(0.032)
Female children 6-10	-0.042	-0.052	-0.042	-0.053
	(0.036)	(0.035)	(0.035)	(0.035)
Male children 11-15	0.001	0.005	0.001	0.005
	(0.034)	(0.033)	(0.034)	(0.033)
Female children 11-15	-0.014	-0.019	-0.011	-0.018
	(0.033)	(0.032)	(0.033)	(0.032)
Male children 16-20	0.005	-0.003	0.006	-0.003
	(0.039)	(0.038)	(0.039)	(0.038)
Female children 16-20	-0.056	-0.064	-0.054	-0.064
	(0.042)	(0.041)	(0.042)	(0.041)
Male children 21+	0.013	0.006	0.011	0.005
	(0.043)	(0.042)	(0.043)	(0.042)
Female children 21+	-0.066	-0.087*	-0.063	-0.087*
	(0.052)	(0.051)	(0.053)	(0.051)

	(1) IHHFE	(2) IHHFE	(3) 2SLS with IHHFE	(4) 2SLS with IHHFE
Number of children residing outside HH	0.002	0.004	0.003	0.004
	(0.010)	(0.010)	(0.010)	(0.010)
Km from regional capital *	0.000	0.000	0.000	0.000
number outside children	(0.000)	(0.000)	(0.000)	(0.000)
Age at baseline (1991-1994)				
5-15 years	0.200***	0.199***	0.187***	0.199***
	(0.028)	(0.027)	(0.041)	(0.038)
16-25 years	0.175***	0.178***	0.163***	0.175***
	(0.037)	(0.036)	(0.046)	(0.043)
26-35 years	0.192***	0.189***	0.188***	0.188***
	(0.061)	(0.060)	(0.061)	(0.060)
36-45 years	0.197***	0.197***	0.190**	0.195***
	(0.075)	(0.074)	(0.077)	(0.075)
46-55 years	0.256***	0.270***	0.253***	0.270***
	(0.086)	(0.084)	(0.086)	(0.083)
56-65 years	0.232**	0.238***	0.231**	0.238***
	(0.093)	(0.091)	(0.093)	(0.090)
66+ years	0.313***	0.302***	0.310***	0.300***
	(0.114)	(0.112)	(0.114)	(0.111)
Constant	-0.137**	-0.125**		
	(0.061)	(0.059)		
Cragg-Donald			11.86	9.33
Sargan Statistic			10.59	11.44
Sargan p-value			0.06	0.04
Number of observations	3,227	3,227	3,227	3,227

Notes: Standard errors are in parentheses. *** indicates significance at 1%; ** at 5%; and, * at 10%.

References

Alderman, Harold, Jere R. Berman, Hans-Peter Kohler, John Maluccio, and Susan Cotts Watkins. 2001. "Attrition in Longitudinal Household Survey Data: Some Tests for Three Developing-Country Samples." *Demographic Research* 5(4).

Beegle, Kathleen. 2000. "Economic Mobility in Indonesia and Vietnam: What Missing Data Can't Tell Us." mimeo.

Beegle, Kathleen, Joachim De Weerdt, and Stefan Dercon. 2006. "Kagera Health and Development Survey (KHDS), 2004, Basic Information Document." mimeo.

Clemens, Michael and Lant Pritchett. 2007. "Is Migration Developement? Global Estimates of Income per Natural." Draft, Center for Global Development

De Weerdt, Joachim. 2006. "Moving out of Poverty in Tanzania's Kagera Region", Paper Prepared for the Moving out of Poverty Study, PREM, World Bank. http://www.edi-africa.com/docs/MoP%20v3.pdf

Demombynes, Gabriel and Johannes Hoogeveen. 2007. "Growth, Inequality and Simulated Poverty Paths for Tanzania, 1992–2002." *Journal of African Economies* 16(4):596-628.

Fields, Gary. 2004. "Dualism in the Labor Market: a Perspective on the Lewis Model after Half a Century." *The Manchester School* 72(6): 724–735.

Harris, John and Michael Todaro. 1970. "Migration, Unemployment and Development: A Two-Sector Analysis." *American Economic Review* 60(1): 126-142.

Hoff, Karla and Arjit Sen. 2005. "The Kin System as a Poverty Trap?" World Bank Policy Research Working Paper 3575.

Kilic, Talip, Gero Carletto, Benjamin Davis and Alberto Zezza. 2007. "Investing Back Home: Return Migration and Business Ownership in Albania." *The Economics of Transition* forthcoming, World Bank Policy Research Working Paper 4366.

Lewis, W.A. 1954. "Economic Development with Unlimited Supplies of Labour." *The Manchester School* 22(2):139-91

McKenzie, David and Marcin J. Sasin. 2007. "Migration, Remittances and Human Capital: Conceptual and Empirical Challenges." World Bank Policy Research Working Paper 4272.

McKenzie, David, John Gibson, and Steven Stillman. 2006. "How Important is Selection? Experimental v. Non-Experimental Measures of the Income Gains from Migration." IZA Discussion Paper No. 2087, World Bank Policy Research Working Paper 3906

Munshi, Kaivan. 2003. "Networks in the Modern Economy: Mexican Migrants in the United States Labor Market." *Quarterly Journal of Economics* 118 (2): 549-597.

Rosenzweig, Mark. 2003. "Payoffs from Panels in Low-Income Countries: Economic Development and Economic Mobility." *American Economic Review* 93(2): 112-117.

Rosenzweig, Mark, and Oded Stark. 1989. "Consumption Smoothing, Migration, and Marriage: Evidence from Rural India." *Journal of Political Economy* 97(4): 905-926.

Stark, Oded and David Bloom. 1985. "The New Economics of Labor Migration." *American Economic Review* 75(2): 173-178.

Stock, James and Motohiro Yogo. 2003. "Asymptotic Distributions of Instrumental Variables Statistics with Many Weak Instruments." manuscript, Harvard University.

URT (United Republic of Tanzania). 2004. "The Economic Report, 2004." President's Office, Planning and Privitisations.

World Bank. 2004. "User's Guide to the Kagera Health and Development Survey Datasets." mimeo.