Economic and spatial mobility in rural Madagascar:

How strong is the link?

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Abstract

We use an original dataset from Madagascar to assess the impact of mobility on the evolution of welfare of individuals from the village of Bepako between 1995 and 2005 using a difference-in-difference specification. We find that 38% of the sample has moved out of the village and that these movers have specific baseline characteristics. Using fixed effects regressions, and adding interactions for specific types of moves, we show that leaving the village has a significant positive impact on the growth of income of individuals who move. The result is robust to different specifications and dependent variables used.

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1. Introduction

In this paper, we study the impact of spatial mobility on economic mobility using original data from a tracking survey carried out in Madagascar in 2005.

Many studies of poverty mobility in developing countries have shown that a considerable amount of poverty is not chronic but in fact transient. They find that, using cross-sectional data, only a minority of households can be defined as "always poor", while over half of households are "sometimes poor" (Dercon & Shapiro, 2007). In this context, understanding why households fall into poverty while others escape from it at some point in time, and identifying the strategies they implement to improve their welfare and cope with risk is of great interest to policy makers.

Spatial mobility has been shown to be one of these strategies. The literature on migration and mobility offers several different theories that explain the decision to move as the result of a maximization of utility, either by the migrant himself or by the whole household. Todaro (1969), in an extension of Sjastaad (1962), sees rural to urban migration as an investment in job search, where the urban labor market offers better opportunities than the rural one. Rural-rural migrations, although less studied because of lack of interest and scarcity of data, are a very important phenomenon, and can be viewed as a household risk-coping strategy (Lucas, 1993). For example, Rosenzweig and Stark (1989) explain the extremely high rate of female marital migration in India by linking it to a risk-spreading strategy implemented by the daughters' initial household.

Studying the impact of mobility on poverty dynamics requires longitudinal data. Unfortunately, most panel surveys define their surveyed units by the dwelling which results in a loss to follow-up in the subsequent waves if a household leaves its house.[3] Dercon & Shapiro (2007) criticize this follow-up rule and recommend following individuals or households rather than dwellings, even if they have left their initial location. However, there has been only a small number of such "tracking" surveys, because considerable costs are associated with them. The importance of such data is crucial because spatial mobility has been shown to be linked with economic mobility, and is implemented as a welfare improving or risk-coping strategy. Thomas, Frankenberg and Smith (2001) for example, use the three waves of the Indonesia Family Life Survey which included tracking of households that had moved

[3] Such follow-up rules are recommended by the LSMS program (Glewwe and Jacoby, 2000).

away from their original house. They find that the baseline characteristics of long-distance movers are quite different from those of non-movers and local movers, which suggests a possible attrition bias in the analysis without tracking data, and a high information content in the follow-up of these movers. Beegle, De Weerdt and Dercon (2008) use the data from a tracking survey in the Kagera region of Tanzania to analyze the impact of migration on economic mobility between 1991 and 2004 and find that moving out of the village considerably improves the growth of consumption compared to staying in the same village.

We use original data from a tracking survey implemented in Madagascar in 2005. This survey was designed to complement the data from the ROR[4], a longitudinal survey carried out in the village of Bepako every year since 1995. This survey contains extensive information on the socio-demographic characteristics of households, consumption and income. Attrition in this survey was high for two reasons: the follow-up rule that defined a survey unit by the dwelling, and an exogenous random reduction of the size of the sample in 1999.[5] The tracking survey, carried out in 2005, attempted to find out where all individuals who belonged to the baseline sample in 1995 lived, and tracked them down to their new location, provided they had not moved too far away, since the tracking survey was restricted to the region around Bepako.

The rest of the paper is structures as follows.We present the dataset in section 2. In section 3, we perform a descriptive analysis of the sample, answering in particular these two questions: do migrants initially have different observable characteristics? How does the follow-up of these movers change the picture of the evolution of welfare of the baseline sample? To assess the impact of spatial mobility on the evolution of income between 1995 and 2005 in a multivariate setting, we use a double-difference framework, which allows us to evaluate the specific impact of migration on the migrants, controlling for initial characteristics and the general economic trend (section 4). We also perform a series of robustness checks to the sample used, the dependent variable and the specification (section 5).

[4] Réseau des Observatoires Ruraux

[5] It was decided to add villages to the survey while keeping the same number of households surveyed, and thus the number of households surveyed in Bepako was randomly divided by two.

2. The data

2.1. The ROR project

The dataset comes from the ROR (Network of Rural Observatories) survey, which has been carried out since 1995 in several different rural villages of Madagascar. This project was founded in 1995 by the Malagasy National Statistical Institute (INSTAT) and the Institut de Recherche pour le Développement (IRD) through the MADIO project (Droy et al., 2000). A rural Observatory is a statistical tool, which aims to follow and monitor the population of a specific area in order to identify the dynamics of improvement or worsening of the living conditions of that population. It is intended to illustrate a particular key issue in the Malagasy agriculture. As such, the data collected are not statistically representative, as the households surveyed live in villages and regions that were chosen according to several specific criteria, such as the agro-climatic zone, the dominant production system, demographic characteristics, etc. (Droy et al., 2000). Four rural Observatories were initially set up in four different regions. Two villages were chosen to be surveyed in each Observatory. It is a household survey, and the data are extensive as they contain information on the dwelling and comfort, demographic and social characteristics of the households, expenditures on food, non food and durables, and comprehensive and detailed modules on the farm inputs and outputs of the households. There are specific modules for the paddy production, consumption and sales, for other crops, livestock and livestock products.

The ROR survey is a longitudinal survey, which attempts to interview the same households on an annual basis. Every year, the survey team takes a census of the population of the village. If a household surveyed the previous year is not found, it is randomly replaced by another one in the village. As this is designed as a household survey, individuals who move out of their initial households are lost to follow-up. Because the follow-up rule is local, all households or individuals who moved out of the village between 1995 and 2005 were also lost. This type of survey design implies a high level of attrition in a context of high geographical mobility, as we will see in section 3.3.

2.2. The tracking survey

In 2005, a tracking survey was carried out. Its aim was to reduce the attrition rate to a minimum between 1995 and 2005. The other motivations for running this survey were to include individual trajectories that are naturally excluded for panels without follow-up, such as migration or household changes, and to account for household instability and recomposition as death, marriages or divorce occur.

The tracking survey was implemented in Bepako, a village situated in Northwestern Madagascar, in the Observatory of Marovoay, which is the closest town.[6] This village was first surveyed in 1995 and has been surveyed since then every year including the present. Bepako was chosen because of the size of the 1995 sample (307 households) and because it was in fact a census, as all households in the village were surveyed.

Bepako is located about 80 km from the third most important city of the country, Mahajanga, and 5 km away from Marovoay, the nearest town. It is situated in the heart of one of the irrigated perimeters of Madagascar, a large flat paddy growing area, where irrigation infrastructures such as canals and pumps were developed during the colonial era. This area grows a very significant amount of the total rice produced in Madagascar, and most of the population in Bepako is involved in the paddy growing sector, as farmer, landowners or as day labourers. The indigenous ethnic group, the Sakalava, is traditionally a tribe of nomadic cattle raisers rather than farmers. Most of the inhabitants of the region are migrants from the East and the centre of the country, who came to the Mahajanga region as farm workers when the irrigation infrastructures were set up, and who were then obliged to find land when it was no longer state owned. The irrigation scheme faced a serious crisis in the 1980s and the farmers no longer had easy access to inputs and agricultural tools. The Observatory tries to analyze the strategies implemented by the farmers to deal with these issues.

The tracking survey consisted in two distinct steps. The first step was the implementation of an

[6] The tracking survey was carried out by Flore Gubert et Anne-Sophie Robilliard (UMR 225 DIAL/IRD), in the context of the project « Dynamique de la pauvreté rurale en Afrique sur longue période : le cas de Madagascar ». I thank them for letting me use this dataset.

individual trajectory survey conducted in Bepako, which aimed to complete the missing information in the ROR surveys on family recomposition and transformations (Gubert F. & Robilliard A.S., 2007). The households from the 1995 panel were first identified through a census in Bepako. A Household Questionnaire was then filled in. This form contained information on the composition of the households every year since 1995, and on the reasons why each household member left or entered the household. There were also questions on transfers from the members who had left the households, a detailed module on child fostering, and a module on the shocks undergone in the previous years by the household, such as bad crops or deaths in the family. The Household Questionnaire was filled in by a household member if one was found still residing in the village. Otherwise, it was filled in by a neighbour or the village chief.

The second step was the actual tracking survey, which aimed to find all individuals or households that had left Bepako, and survey them with a living standards questionnaire. To find these individuals, interviews with non-movers were performed as follows: when all members of the original 1995 household had left Bepako, a Household Tracking Form was filled in by a person who knew the household (friend, neighbour) or by the village chief, to collect as detailed information as possible on the new location of the household. If only some members of the household had left the village, then an Individual Tracking Form was filled in with the same type of information. The surveyors could then try to physically find them in their new location. This search was limited to individuals who had stayed in the region, that is, short and medium distance movers, but not long distance movers. A major reason for restricting the tracking to the region is to be found in the specificity of migrants in Madagascar. where it is a very widespread practice to be buried in one's region of origin, in the same vault as the rest of the family. Many inabitants of Bepako are in fact migrants or children of migrants, and they originate from far away regions, often the east of the country or the central highlands. When they reach old age, if they can afford it, they return to their native region to die and be buried there. Chances of finding them still alive were thus very slim for a high cost of research, which motivated the decision to not try to find them. Once they were found, they were interviewed using a standard ROR type questionnaire if they had stayed in a rural area or if their main activity was rural. If they had left the agricultural sector and lived in a town or city, they answered a different,

specifically urban questionnaire.

2.3. Tracking results

The results of the tracking survey at the household level are shown in Table 1. Out of the 307 households initially interviewed in 1995, the surveyors were able to recontact at least one initial member of 258 households, which amounts to a re-contact rate of 84%, which is quite high. All members of seven households were deceased over the 10-year period. Conditional on being alive, the household re-contact rate was thus 86%. The 42 remaining households were either not found at all in 2005 or had moved too far away to be recontacted. As shown in Table 2, 434 households were interviewed in 2005. These households all contain at least one individual who belonged to a baseline household in 1995.

We now turn to the tracking results at the individual level, as the tracking was undertaken on an individual basis, trying to locate not only all baseline households, but also all baseline individuals in their new dwelling in 2005. There were 1490 individuals in the 1995 ROR survey. Figure 1 shows the tracking rates and the different categories of individuals. There are 662 individuals who were still residing in Bepako and in the same household as in 1995. This group is the panel without tracking, that is, the 1995-2005 panel that would have been obtained without any attempt to track movers. The tracking survey allowed us to recontact a total of 1068 individuals. Excluding those 134 who had died in the 10 year period, this represents a recontact rate of 78.8%. This figure is comparable to the tracking rate of 82.2% in Beegle et al. (2009). The remaining 288 individuals who were not recontacted were so either because they could not be found in the second phase of the survey, or because they had moved outside of the tracking zone (regional).

The location of the baseline individuals is of particular interest in this paper on geographical mobility. The information on the new location is available for a large number of individuals, even those who were not found in 2005. Table 3 shows the distribution of the locations in 2005. 837 individuals are known to be still residing in Bepako (32 were not found), while 519 have moved out. Conditional on being alive, this represents an outmigration rate of 38.3%, which is very high. As shown in Table 4, 263 of these movers were found, that is, half of those who outmigrated. The very

high rate of outmigration leads us to analyze the reasons and impact of this phenomenon on the living standards of the movers.

3. Descriptive analysis of migrants from Bepako

In this section, we first discuss the characteristics of migrants and non migrants, then we analyze the impact on the overall growth of income of the follow-up of migrants.

3.1. Different types of moves

Tables 3 to 5 show descriptive statistics by location, type of move and exit reason. Among the movers for which the destination is known, 52% stayed in the same district, while 35% moved further away while still residing in the tracking zone (region). The remaining 13% are national long-distance movers, who were not surveyed in the tracking process. There were no international migrants in the sample. Two-thirds of the moves are rural-rural while one-third was rural-urban. The latter often means that the main activity is no longer farming or cattle-raising but rather unskilled jobs in industries or construction.

The main reasons for moving out are marriage and divorce, either as an individual who gets married (resp. divorced) and leaves the original household, or as a child who leaves the household as one of its parents gets married (resp. divorced). Along with child fostering, a widespread practice in Madagascar, these family motives for moving out represent a little less than half of outmigration (Table 5). Economic reasons such as job search, land search or studies are why about one third of movers do so.

3.2. Are migrants different from non-migrants?

Table 6 compares the baseline characteristics of the 263 individuals who moved out of Bepako and were tracked in 2005 to those of the 805 individuals who were still living there in 2005. According to Table 6, migrants are more often women than men. They are younger, have less biological children residing with them and are more often single than married. The status in the household is generally

different between the 2 groups, with migrants being more often children of household heads or non-related members of the household. Household heads tend to be underrepresented among migrants. These results are intuitive and consistent with the literature on migration, which finds that the number of children and being married inhibit migration as they induce larger costs in moving (Robinson and Tomes, 1982). The proportion of individuals born in another district or region of the country is significantly higher among migrants. As mentioned previously, Bepako is an immigration village, so a number of individuals in the sample could be previous migrants returning to their home region or migrating again to another destination. Besides, their family and social ties could be weaker than those who were born there. Migrants seem, in any case, to be more mobile "from the start".

Our main measure of welfare is per capita annual income, measured in thousands of Malagasy Francs (FMg). We choose income over consumption to make intertemporal comparisons because of questionnaire inconsistencies in the expenditure modules between the two waves. We consider the income measure to be reliable in this very rural setting, because the survey was designed to collect data on agriculture in the Observatories. In particular, they contain very detailed data on agricultural production, sales and consumption of paddy and other crops, cattle possession and sales, input and labour costs. The income is calculated as the difference between the sum of gross farm and non-farm income and production costs. Non-farm income sources are wage labour and secondary activities, such as fishing or small businesses and trade. The income of urban individuals in 2005 is computed differently as the questionnaire did not (logically) include data on farm income. It is defined as the sum of total wages and profits, secondary activity income and non-labor income (such as pensions and financial income). For lack of another available price index, real measures in 2005 were obtained by deflating them with a consumer price of rice index, differentiated spatially.

Following Filmer and Pritchett (2001), we also calculate a synthetic asset index using Principal Component Analysis. Variables included in the index are an indicator of crowding (equal to one if there are more than 2 individuals per room) the quality of the housing materials (all high quality or all low quality), ownership of a sewing machine, a radio, a table, chair, bed, armchair, ownership of cattle, ownership of land

Looking at economic characteristics in Table 6, we see that migrants come from poorer households

in terms of income and capital endowment, and are less often paddy producers. Among those households that have a positive farm income, migrants' households have a lower paddy production, lower cattle value and a smaller area cultivated while their non-farm income is higher.

In the context of Bepako, which is situated at the heart of the paddy growing area, and where farming and, in particular, rice growing is the main source of income, these descriptive statistics suggest that movers are initially worse off in terms of paddy field endowment and already carry out income diversification strategies to compensate for that handicap. Outmigration of one or several members of household could then be considered an additional strategy.

Assuming that these statistics could be driven by life cycle effects, we refine the analysis by looking at the characteristics of migrants and non migrants by age category. Tables 7a, 7b and 7c show main socio-demographic and economic characteristics for three age categories in 1995: 15-24 years, 25-39 years, and 40-55 years. We notice that younger migrants (first age group) have a non-significantly higher income per capita than non-migrants (but the p-value of the Student statistic is close to the 10% level), which suggests a possibly different pattern of migration for this age category. They also come from households with a higher non-farm income and fewer farmers. In this age category, socio-demographic characteristics of migrants and non-migrants are very similar. Only the marital status differs significantly between the 2 groups: 75% of young adult migrants are single, against 63% of non-migrants. Movers between 25 and 39 years at baseline come from poorer households who cultivate smaller areas of land. Three quarters of them come from paddy producing households, while non-movers almost all produce paddy (94%). 67% of them are married at baseline, which means that divorce is a more frequent event in this category, implying different consequences in terms of socioeconomic status. On the other hand, the older category of migrants, those between 40 and 55 at baseline are significantly poorer in terms of income and capital endowment, they work on a smaller area of farmland and their paddy production is lower.

Table 8 shows the moving reason by age category, divided in three broad categories: family (marriage, divorce, fostering), economic (land or job search, studies), and other reasons. It shows that the proportion of moves motivated by family events decreases with age, while economic motivated migrations are more frequent among older migrants.

These results suggest two different patterns of migration in the sample, consistent with different interpretations of migration that have been given in the literature. Younger, single individuals move out of their family's home and village to marry. The reason is not necessarily economic, but there could represent risk-spreading strategies as in Rosenzweig and Stark (1989). The second pattern of migration is more income-driven: individuals, who are poorer and have a family to feed (older individuals), migrate to find land or jobs in an environment with very high pressure on the land (caused by irrigation issues and an important immigration *to* Bepako). We attempt to confirm these assumptions in the econometric analysis in the section 4.

3.3. Migrant follow-up and income dynamics

In Table 9, we compare the evolution of the living standard of tracked movers and stayers. Individuals who stayed in Bepako saw their income improve by an average 60% per capita, while the change was significantly higher for the movers (164%). Although it is not statistically significant, it is worth mentioning that movers started out with a lower per capita income than stayers, and ended up in 2005 with a higher one. This is also true of the poverty headcount. 44% of the movers were poor, against 34% for the stayers in 1995. While both groups saw this measure decrease during the 10-year period, there was more poverty among stayers in 2005. This suggests a catching-up process between the income of the stayers and the movers. Moving out can be considered as an explanation of the process: the poorest choose to change villages in order to take advantage of economic opportunities elsewhere, such as a more favourable job market or less pressure on the land. This assumption will be checked in the multivariate analysis in the next section.

This result has another strong, methodological, implication: it shows the utility of a tracking survey in the assessment of the welfare changes of a particular population, namely the inhabitants of Bepako in 1995. The extra information obtained thanks to the tracking resulted in a global picture of the growth of income that is higher that what would have been observed using only the information from the stayers.

4. Econometric analysis of the impact of migration on the change in welfare between 1995 and 2005

Several specifications are used to assess the impact of migration on the change in welfare between 1995 and 2005 in a multivariate setting. The first model estimated is:

$$\Delta \log y_{it,t-1} = \alpha + \beta_1 X_{i,t-1} + \beta_2 H_{i,t-1} + \delta Mig_i + \varepsilon_i \ ,$$

where y_{it} is the income per capita of individual i in period t; $X_{i,t-1}$ are individual baseline characteristics that include gender, age, education, marital status; and $H_{i,t-1}$ are household baseline characteristics (age, education and gender of head). Mig_i is the variable of interest, which is equal to 1 if the individual moved out of the village between the two periods, 0 otherwise. As this specification imposes a coefficient equal to 1 on the baseline income, we also estimate the model with the 2005 income per capita as the dependent variable, and baseline income as an explanatory variable. Results of these estimations are shown in column (1) and (2) of Table 10. All regressions have robust standard errors clustered at the initial household level. None of the baseline characteristics are significant in the first model, while education of head and initial income are positive and significant in the second column. Individuals with a higher initial level of welfare end up with a higher level of income whether they migrate or not, which is intuitive. Migration has a positive and significant impact (at the 10% level) on the 2005 level of income per capita.

This first estimation of the effect of migration confirms the assumption of migration as an income improving strategy. However, it does not control for unobserved heterogeneity among households and individuals which can bias the estimates by affecting both the decision to migrate and the outcome. To control for this possible source of bias, and following Beegle et al. (2009), we introduce in the estimations initial household fixed effects. The framework is now a difference-in-difference model with baseline individual covariates only:

$$\log y_{iht} = \alpha + \beta X_{i,t-1} + \mu_h + year_t + \delta Mig_{it} + \varepsilon_{it} \ ,$$

where μ_h is the initial household fixed effect, $year_t$ is a time fixed effect, equal to 1 if *t* equals 2005

and Mig_{it} equals 1 if the individual is a migrant in 2005, 0 otherwise. The individual baseline covariates are the same as in the previous model, but the household covariates are gone, as they are all captured by the fixed effect, including initial income per capita. This specification assumes that within a given household, there is no unobserved heterogeneity that would explain both the decision to move and the outcome. The estimator δ is thus a within household estimator: it gives the impact of mobility on the income of individuals compared to the income of other members of the initial household that did not move out of the village. While individual covariates are still not significant, the migration variable remains positive and significant in this specification, as shown in column (3) of Table 10. The dummy for the year 2005 is also positive and very significant: there is a positive trend on welfare during that period, which affected everyone, movers and stayers.

The remaining source of bias caused by individual heterogeneity is controlled for in the next model, which introduces individual fixed effects μ_i :

$$\log y_{it} = \alpha + \mu_i + year_t + \delta Mig_{it} + \varepsilon_{it} \ .$$

Results of this specification are shown in column (4) of Table 10. We see that, once the positive time trend and all non-time varying individual heterogeneity, including initial per capita income are controlled for, having moved out of Bepako generated an income growth 31 percentage points higher than having stayed in the village.

In Table 11 we add to the model specific interaction variables to evaluate the impact of moving out for specific destinations and migrant characteristics. The specific effects we analyze are moving to an urban area, being a female migrant, being a regional migrant (in contrast with staying in the district), reasons for migration (economic or family motives), and age categories of migrants. Type of migration, gender of migrant and distance of the move do not change significantly the impact of mobility on income. In Column (4) of table 11, the sample is smaller as we do not include observations for which the moving reason was unknown. Therefore, the coefficient of the migrant variable shows the marginal effect of moving for family reasons, which is positive and significant at the 5% level. Interestingly, the effect on the growth of income of moving out for economic motives,

such as looking for a job or more land has a smaller effect than moving out for family reasons. The impact of geographic mobility is highest among the young adult group (15-24 years old) and the 44-55 years age group, while it is significantly lower among those between 25 to 40 years old.

5. Robustness checks

We now check for the robustness of our results to the construction of the sample, different estimations methods and alternative measures of welfare.

5.1. Household level sample

The sample used in the estimations of section 5 is made up of *all* individuals who moved out of the village and stayed in the village respectively between 1995 and 2005. It includes children who followed their parents to their new location. However, one can assume that they did not choose to stay or move. We propose to run the same regressions on a sample containing only one observation by pair of initial and final household. This means, for example, that if a man moves with his wife and children, we keep only the observation of the man and drop the other members. For each "group" of movers, we keep the head of the group. If the group is made up of several children (for example, who return to their parents' home after a period of fostering), we keep only the oldest. This method removes multiple observations with the same baseline and final income and initial household characteristics, while keeping the individual characteristics of the one who, presumably, took the decision to move. The extra weight given to large households is also removed using this "reduced" sample.

Table 12 shows the results of these regressions using the individual fixed effects specification and the various interaction variables already showed in table 11. Migration is still positive and significant in all specifications except the one that includes a gender dummy variable. As explained previously, this household level sample was constructed in a way that kept only the individual that is assumed to be the decision-maker for such matters as migration in a family. Therefore, women remaining in the

sample either moved without their husband, or were single, widowed or divorced when they moved, otherwise their husband would be the one kept in the regressions. Column (2) of table 12 shows that migration is an income increasing decision for women moving without their spouse while it has no significant impact on the growth of the income of men. To interpret this unexpected result, we examine the moving reason by gender in this "decision-maker" sample (Table 13). Marriage- and divorce-motivated moves are much more frequent among female migrants than male, as they represent about three quarters of women's moves. Very few of them actually move for economic reasons such as finding a job or more land. On the other hand, the moving reasons are more evenly distributed among male migrants. Besides, the mean age of female migrants is 20 years old, against 28 years for male. This tends to confirm the assumption made in section 3.2: there are apparently two very different patterns of migration in the sample, differentiated by gender and motivation. There is some evidence of Rosenzweig & Stark (1989) type migration, where young, single women move out of their village to marry. This could be encouraged by the initial household, and the destination household, in which they marry, could be chosen purposely to improve the woman's welfare, and, potentially, to create a risk-sharing network for both families. The other type of migration is more directly income-driven, as older males move out of the village to improve their welfare and their family's. However, the regression results show that this strategy is not actually very efficient, although they could actually be avoiding a worsening of their situation.

5.2. Semi-parametric difference-in-difference analysis

Following Abadie (2005), we estimate the impact of outmigration on income using a semi-parametric difference-in-difference estimator. We consider migration as a treatment that occurred between 1995 and 2005 to some individuals and not to others. The estimation strategy is in two steps. In the first step, a logit model of the probability of moving out is estimated. The predicted conditional probability is the propensity score $P(Mig = 1 | X)$. This conditional propensity score is used to weigh the observations of non-migrants by the following factor: $\frac{P(Mig = 0)}{P(Mig = 1)} * \frac{P(Mig = 1 | X)}{P(Mig = 0 | X)}$.

With this method, we are weighing up (resp. weighing down) the outcome ($\Delta \log y_{it,t-1}$) of non-migrants who have covariates under-represented (resp. over-represented) among them. This means imposing the same distribution of covariates among migrants and non-migrants (Abadie, 2005). An individual fixed-effect model is estimated using the weighted outcomes for non-migrants.

The first stage regression results are shown in Table 14a for both the individual sample and the household level sample presented in section 5.1.

Table 14b shows the result of the weighted fixed effect model for both samples. We see that migration is once again positive and significant and the results are quite close in magnitude to the previous specifications.

5.3. Alternative measures of welfare

We now check for the robustness of the results to other welfare measures. As mentioned in section 3.2, we do not have a measure of consumption that is comparable between 1995 and 2005. However, we do have a satisfactory measure of consumption in 2005, which we can use as a dependent variable in the cross-sectional specification (as in columns (1) and (2) of Table 10), but we must use initial income or the initial asset index as a control instead of initial consumption. We also use the asset index in 2005 as a measure of welfare. As it is comparable over time, the individual fixed effect model is also estimated using this measure. In addition, we run the regression on the per adult equivalent income[7] instead of the per capita income, to check whether the results are driven by changes in the household composition. Results of these regressions are presented in Table 15.

It is clear that the results are similar whether we use income, consumption or an asset index. In all cases, outmigration significantly raises welfare in 2005.

[7] We use the Oxford equivalence scale to calculate per adult equivalent measures.

6. Conclusion

In this paper we attempted to assess the impact on the income of individuals of moving out of their village of Bepako, Madagascar, compared to staying in the village, between 1995 and 2005. In all the specifications, we find that spatial mobility has a significant impact on economic mobility. Adding interacted variables to take into account different types of mobility and movers does not fundamentally change the result in most cases, which can be interpreted as the fact that mobility in itself is the factor influencing income, and not particular types of migrations. However, we do find a differentiated effect of female migration which is consistent with different interpretations of the migration decision found in the literature.

There are several limitations to this study. A first limitation is the remaining attrition bias. As mentioned, about half of all migrants were found in the tracking survey, which significantly reduced attrition in the sample. The other half was either not found or long-distance movers, which were not included in the tracking plan. Long-distance movers presumably have different characteristics and motivations than short-distance movers. For example, in Madagascar, being buried in the village of one's ancestors is extremely important. As explained in section 3.2, Bepako is an immigration village, and a large part of its population actually originates from another region of the country. This means that elderly people, if they can afford it, tend to go back to their family's region to end their life and be buried there. Furthermore, wealthy households that can invest their savings in secondary homes in their native region and move there do so. As a consequence, long-distance migrants and maybe lost migrants too probably have a different set of characteristics and their income dynamics are not included in the survey. This could results in an attrition bias in the estimates. This issue will be tackled by further research.

Secondly, while the difference-in-difference estimator with individual fixed effects controls for non-time varying heterogeneity in the sample, a remaining source a possible bias could be found in time-varying heterogeneity. The specification assumes that without migration, movers and stayers would have had parallel trajectories, and that the difference in income in 2005 is strictly caused by moving out. However, if there are observable or unobservable characteristics that varied in the 10-year

period and were correlated with migration, the coefficient on migration could be overestimated. For example, if an individual moves out to get married and chooses his spouse in a wealthier household in order to improve his income, then marriage is causing the increase in welfare, not migration *per se*. As our dataset contains data for every year between 1995 and 2005 (not for every individual) as well as information on the individual trajectories and family recompositions (deaths, marriages, births), we will pursue our research in this direction.

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8. Tables

Table 1: Recontact of baseline households

	No.	%
Recontacted	258	84
None found	42	13.7
All deceased	7	2.3
Total	**307**	**100**

Table 2: Households interviewed in 2005

	No.	%
Stayed in Bepako	277	63.8
Same household	*167*	*38.5*
Split	*110*	*25.3*
Moved from Bepako	157	36.2
Total	**434**	**100**

Table 3: Location of individuals in 2005

Location	No.	%
Stayed in Bepako	837	56.2
Migrated	519	28.3
Marovoay district	*217*	*14.6*
Mahajanga region (tracking zone)	*148*	*9.9*
Long-distance move	*56*	*3.8*
Unknown location	98	6.6
Deceased	134	9
Total	**1490**	**100**

Table 4: Individual tracking results

Tracking status	No.	%
Surveyed: same household	662	44.4
Surveyed: different household or village	406	27.2
Split (In Bepako)	*143*	*9.6*
Migrant (Out of Bepako)	*263*	*17.7*
Lost/too far	*288*	*19.3*
Deceased	134	9.0
Total	**1490**	**100.0**

Table 4a: Urban or rural migration

	No.	%
Rural	178	67.7
Urban	85	32.3

Table 5: Exit reason of movers

Exit reason	No.	%
Mariage	57	21.7
Divorce	51	19.4
Child fostering	10	3.8
Migration for job search	29	11.0
Migration for studies	21	8.0
Migration for land search	35	13.3
Other/unknown	60	22.8
Total	**263**	**100**

Figure 1: Individual tracking results

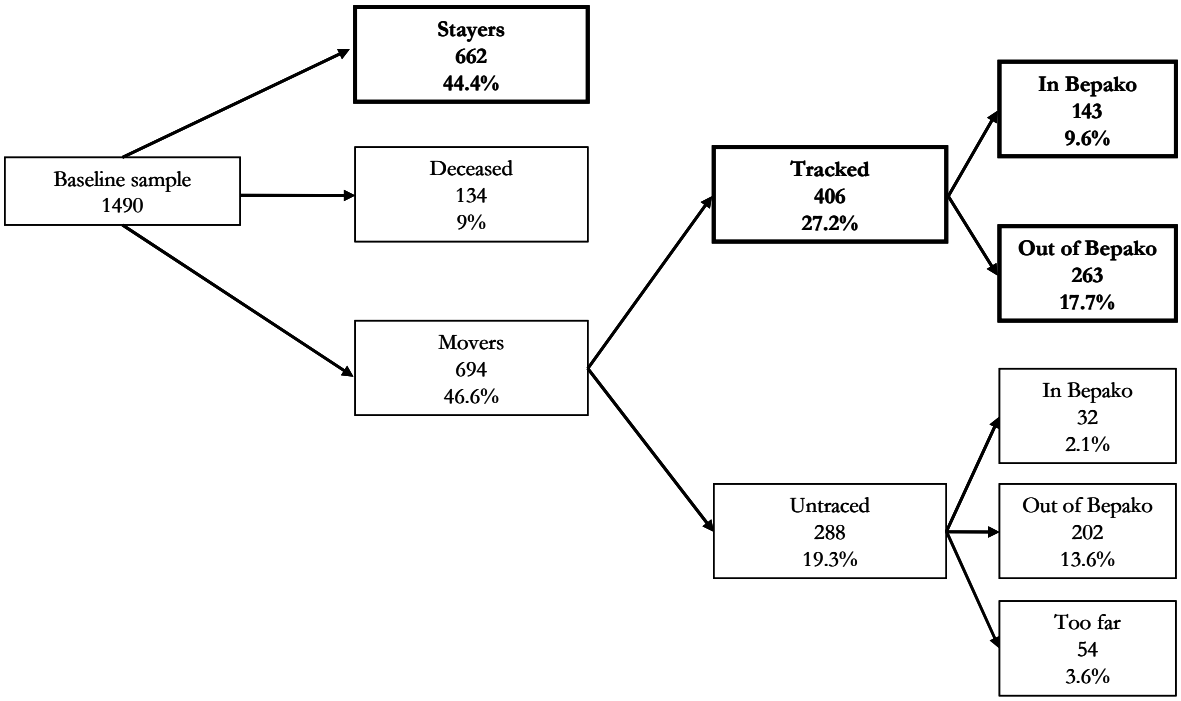

Table 6: Baseline characteristics of migrants and non migrants (mean comparison tests)

	Non-migrant	N	Migrant	N	Difference	P-value
Socio-demographic characteristics						
Female	0.48	805	0.53	263	0.05	0.14
Age	21.22	805	18.93	263	-2.29	0.05
Number of children	1.07	805	0.78	263	-0.29	0.03
Education (years)	3.02	805	2.92	263	-0.10	0.63
Education (deviation)	0.00	805	-0.14	263	-0.14	0.34
Marital status						
Married	0.34	805	0.27	263	-0.07	0.03
Single	0.60	805	0.69	263	0.08	0.01
Widow	0.04	805	0.04	263	0.00	0.88
Link to head						
Head	0.38	805	0.29	263	-0.09	0.01
Spouse	0.17	805	0.13	263	-0.04	0.12
Child	0.50	805	0.59	263	0.09	0.02
Inlaw	0.00	805	0.01	263	0.00	0.42
Related	0.08	805	0.04	263	-0.04	0.02
Other	0.03	805	0.07	263	0.04	0.00
Birth location						
District	0.81	805	0.70	263	-0.11	0.00
Region	0.06	805	0.11	263	0.05	0.02
Country	0.13	805	0.19	263	0.06	0.01
Household characteristics						
Age of head	43.83	805	42.76	263	-1.07	0.27
Education of head (years)	4.14	805	3.99	263	-0.15	0.48
Education of head's spouse (years)	3.06	805	2.71	263	-0.34	0.09
Female head	0.04	805	0.03	263	-0.01	0.44
Size of household	6.10	805	6.24	263	0.14	0.45
Economic characteristics						
Per capita income of household (log)	6.14	803	5.95	260	-0.19	0.00
Asset index	0.15	704	-0.40	214	-0.56	0.00
Household produces paddy	0.94	805	0.86	263	-0.08	0.00
Value of paddy production	2954.78	757	2506.11	226	-448.67	0.00
Value of other crops production	343.15	413	331.58	128	-11.56	0.90
Value of livestock holding	1006.88	704	676.10	214	-330.78	0.06
Income from renting out of paddy fields	4578.26	78	3489.21	27	-1089.05	0.66
Non-farm income	810.42	619	946.93	213	136.52	0.03
Area operated (are)	185.64	757	152.69	226	-32.94	0.00
Owns land	0.64	805	0.61	263	-0.04	0.30
Owns cattle	0.33	805	0.25	263	-0.09	0.01

Baseline characteristics of migrants and non migrants by age group (mean comparison tests)

Table 7a: 15-24 years

	Non-migrant	N	Migrant	N	Difference	P-value
Socio-demographic characteristics						
Female	0.48	163	0.44	64	-0.04	0.58
Age	19.32	163	18.81	64	-0.51	0.23
Number of children	0.50	163	0.39	64	-0.11	0.38
Education (years)	5.08	163	4.81	64	-0.27	0.47
Education (deviation)	0.23	163	0.01	64	-0.22	0.55
Marital status						
Married	0.33	163	0.23	64	-0.10	0.15
Single	0.63	163	0.75	64	0.12	0.09
Widow	0.04	163	0.02	64	-0.02	0.41
Link to head						
Head	0.29	163	0.20	64	-0.09	0.16
Spouse	0.21	163	0.13	64	-0.08	0.15
Child	0.60	163	0.61	64	0.01	0.84
Inlaw	0.01	163	0.03	64	0.02	0.33
Related	0.06	163	0.05	64	-0.01	0.67
Other	0.04	163	0.11	64	0.07	0.03
Birth location						
District	0.74	163	0.69	64	-0.05	0.41
Region	0.10	163	0.13	64	0.03	0.56
Country	0.16	163	0.19	64	0.03	0.61
Household characteristics						
Age of head	43.47	163	45.03	64	1.56	0.49
Education of head (years)	3.59	163	4.11	64	0.52	0.22
Education of head's spouse (years)	2.66	163	2.91	64	0.25	0.54
Female head	0.00	163	0.00	64	0.00	.
Size of household	6.12	163	6.31	64	0.20	0.64
Economic characteristics						
Per capita income of household (log)	6.14	163	6.29	64	0.15	0.12
Asset index	0.07	142	0.19	51	0.12	0.74
Household produces paddy	0.94	163	0.92	64	-0.02	0.65
Value of paddy production	3025.72	153	3240.92	59	215.20	0.52
Value of other crops production	234.07	87	393.56	36	159.48	0.11
Value of livestock holding	1044.21	142	1046.94	51	2.73	1.00
Income from renting out of paddy fields	4309.97	19	8821.30	9	4511.33	0.41
Non-farm income	795.14	122	1137.43	45	342.29	0.01
Area operated (are)	186.05	153	181.25	59	-4.79	0.79
Owns land	0.63	163	0.70	64	0.07	0.31
Owns cattle	0.33	163	0.23	64	-0.09	0.18

Table 7b: 25-39 years

	Non-migrant	N	Migrant	N	Difference	P-value
Socio-demographic characteristics						
Female	0.48	155	0.57	42	0.09	0.28
Age	32.07	155	31.52	42	-0.55	0.47
Number of children	2.65	155	1.98	42	-0.67	0.06
Education (years)	5.48	155	4.83	42	-0.64	0.22
Education (deviation)	0.12	155	-0.42	42	-0.54	0.31
Marital status						
Married	0.77	155	0.67	42	-0.11	0.15
Single	0.15	155	0.17	42	0.01	0.85
Widow	0.06	155	0.14	42	0.08	0.10
Link to head						
Head	0.85	155	0.83	42	-0.01	0.85
Spouse	0.37	155	0.38	42	0.01	0.94
Child	0.13	155	0.14	42	0.01	0.82
Inlaw	0.00	155	0.00	42	0.00	.
Related	0.01	155	0.00	42	-0.01	0.60
Other	0.02	155	0.02	42	0.00	0.86
Birth location						
District	0.68	155	0.43	42	-0.25	0.00
Region	0.06	155	0.17	42	0.10	0.04
Country	0.26	155	0.40	42	0.15	0.06
Household characteristics						
Age of head	39.19	155	38.86	42	-0.33	0.87
Education of head (years)	4.92	155	4.29	42	-0.64	0.21
Education of head's spouse (years)	3.74	155	2.71	42	-1.02	0.06
Female head	0.06	155	0.12	42	0.06	0.17
Size of household	5.62	155	5.29	42	-0.33	0.45
Economic characteristics						
Per capita income of household (log)	6.14	154	5.92	41	-0.21	0.09
Asset index	-0.17	128	-0.65	35	-0.48	0.21
Household produces paddy	0.94	155	0.74	42	-0.20	0.00
Value of paddy production	2738.25	146	2136.81	31	-601.44	0.08
Value of other crops production	488.70	76	367.74	19	-120.96	0.71
Value of livestock holding	611.71	128	324.48	35	-287.23	0.10
Income from renting out of paddy fields	14055.13	8	1683.57	4	-12371.56	0.24
Non-farm income	768.48	127	938.60	36	170.11	0.29
Area operated (are)	175.23	146	138.13	31	-37.10	0.04
Owns land	0.56	155	0.57	42	0.01	0.91
Owns cattle	0.26	155	0.14	42	-0.12	0.10

Table 7c: 40-55 years

	Non-migrant	N	Migrant	N	Difference	P-value
Socio-demographic characteristics						
Female	0.56	88	0.48	25	-0.08	0.50
Age	46.17	88	45.56	25	-0.61	0.53
Number of children	3.17	88	3.48	25	0.31	0.58
Education (years)	3.33	88	3.04	25	-0.29	0.64
Education (deviation)	-0.45	88	-0.87	25	-0.41	0.48
Marital status						
Married	0.77	88	0.88	25	0.11	0.24
Single	0.06	88	0.00	25	-0.06	0.23
Widow	0.09	88	0.08	25	-0.01	0.87
Link to head						
Head	0.94	88	0.96	25	0.02	0.74
Spouse	0.36	88	0.36	25	0.00	0.97
Child	0.03	88	0.00	25	-0.03	0.35
Inlaw	0.00	88	0.00	25	0.00	.
Related	0.01	88	0.00	25	-0.01	0.60
Other	0.01	88	0.04	25	0.03	0.34
Birth location						
District	0.72	88	0.48	25	-0.24	0.03
Region	0.05	88	0.12	25	0.07	0.18
Country	0.24	88	0.40	25	0.16	0.11
Household characteristics						
Age of head	48.65	88	48.68	25	0.03	0.99
Education of head (years)	3.59	88	2.96	25	-0.63	0.34
Education of head's spouse (years)	2.09	88	1.76	25	-0.33	0.53
Female head	0.16	88	0.12	25	-0.04	0.63
Size of household	6.13	88	6.24	25	0.12	0.85
Economic characteristics						
Per capita income of household (log)	6.25	88	5.93	25	-0.32	0.04
Asset index	0.33	80	-0.87	19	-1.20	0.03
Household produces paddy	0.93	88	0.88	25	-0.05	0.40
Value of paddy production	3666.59	82	2111.82	22	-1554.77	0.01
Value of other crops production	169.67	46	287.34	10	117.67	0.36
Value of livestock holding	1110.60	80	914.99	19	-195.61	0.77
Income from renting out of paddy fields	1165.75	9	708.87	2	-456.88	0.75
Non-farm income	855.54	67	899.55	21	44.01	0.81
Area operated (are)	209.54	82	142.36	22	-67.17	0.03
Owns land	0.70	88	0.64	25	-0.06	0.54
Owns cattle	0.33	88	0.36	25	0.03	0.78

Table 8: Exit reason of movers by age category

Age category	15-24		25-39		40-54		Total	
	No.	%	No.	%	No.	%	No.	%
Family reasons	35	54.7	19	45.2	6	24	61	44.2
Economic reasons	22	34.4	16	38.1	13	52	54	39.1
Other/unknown	7	10.9	7	16.7	6	24	23	16.7
Total	**64**	**100**	**42**	**100**	**25**	**100**	**138**	**100**

Table 9: Income growth of migrants and non migrants (mean comparison test)

	Non-migrant	N	Migrant	N	Difference	P-value
1995 Income per capita (1000 FMg)	607.72	805	511.93	263	-95.79	0.03
2005 Income per capita (1000 FMg)	740.40	805	818.44	263	78.04	0.25
1995-2005 Change in income per capita (1000 FMg)	132.68	805	306.51	263	173.83	0.00
1995-2005 Change in income per capita (%)	59.46	803	163.73	260	104.27	0.00
1995 Asset index	-0.67	805	-0.77	263	-0.10	0.00
2005 Asset index	0.18	805	3.29	263	3.11	0.00
1995 Poverty rate	0.34	805	0.45	263	0.11	0.00
2005 Poverty rate	0.20	805	0.20	263	0.00	0.94

Table 10: Impact of migration on income (OLS regressions)

	(1)	(2)	(3)	(4)
Dependant variable	**Log income change**	**2005 Log income**	**Log income** *Initial household fixed effects*	**Log income** *Individual fixed effects*
Migrant	**0.303****	**0.162***	**0.270****	**0.311*****
	(0.121)	(0.0931)	(0.112)	(0.0703)
Male	-0.0655	-0.00364	-0.00433	
	(0.0527)	(0.0405)	(0.0164)	
Age	-0.0514	0.526	0.000392	
	(0.812)	(0.590)	(0.00288)	
Age²	-0.00213	-0.00368	1.73e-05	
	(0.0112)	(0.00799)	(4.05e-05)	
Education (deviation to age mean)	0.00950	0.0151	0.00533	
	(0.0144)	(0.00963)	(0.00363)	
Education²	-0.00242	0.000596	-0.000345	
	(0.00456)	(0.00390)	(0.000965)	
Single	0.0472	0.116	0.0339	
	(0.123)	(0.0930)	(0.0425)	
Widow/divorced	0.0214	-0.0425	0.00394	
	(0.190)	(0.128)	(0.0605)	
Age of household head	1.110	1.682		
	(2.109)	(1.530)		
Age² of household head	-0.00837	-0.0115		
	(0.0209)	(0.0147)		
Education of head (years)	0.00425	**0.0279****		
	(0.0201)	(0.0136)		
Female head of household	0.0780	0.184		
	(0.229)	(0.130)		
Log 1995 income		**0.206*****		
		(0.0661)		
Year 2005			**0.197*****	**0.187*****
			(0.0520)	(0.0266)
Constant	-0.101	4.295***	6.054***	6.092***
	(0.496)	(0.476)	(0.0609)	(0.0129)
Observations	1063	1063	2131	2131
R-squared	0.033	0.091	0.094	0.111

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

Table 11: Impact of migration on income with specific interactions (individual fixed effects specification)

	(1)	(2)	(3)	(4)	(5)
Variables	**Log income**	**Log income**	**Log income**	**Log income**	**Log income**
Migrant	**0.331*** **	**0.255** **	**0.362*** **	**0.227** **	**0.452*** **
	(0.0791)	(0.105)	(0.0902)	(0.0961)	(0.103)
Year 2005	-0.0651				
	(0.149)				
Migrant to urban area	**0.187*** **	**0.187*** **	**0.187*** **	**0.187*** **	**0.187*** **
	(0.0266)	(0.0266)	(0.0266)	(0.0266)	(0.0266)
Female migrant		0.105			
		(0.131)			
Regional migrant (reference: local)			-0.131		
			(0.130)		
Economic migrant (reference: family reasons)				-0.114	
				(0.150)	
Migrant*0-14 years					-0.128
					(0.225)
Migrant* 25-40years					**-0.357** **
					(0.153)
Migrant*40-55 years					0.0858
					(0.186)
Migrant*55+ years					-0.298
					(0.229)
Constant	6.092***	6.092***	6.092***	6.103***	6.092***
	(0.0129)	(0.0128)	(0.0128)	(0.0126)	(0.0128)
Observations	2131	2131	2131	2071	2131
R-squared	0.112	0.112	0.113	0.077	0.121

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

Table 12: Impact of migration on income using the household level sample (individual fixed effects specification)

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**Log income**	**Log income**	**Log income**	**Log income**	**Log income**	**Log income**
Migrant	**0.302*** **	**0.292*** **	0.124	**0.334*** **	**0.294** **	**0.555*** **
	(0.0968)	(0.110)	(0.141)	(0.118)	(0.115)	(0.141)
Year 2005	**0.175*** **	**0.175*** **	**0.175*** **	**0.175*** **	**0.175*** **	**0.175*** **
	(0.0456)	(0.0457)	(0.0457)	(0.0457)	(0.0457)	(0.0457)
Migrant to urban area		0.0304				
		(0.188)				
Female migrant			**0.354** **			
			(0.169)			
Regional migrant (reference: local)				-0.0837		
				(0.175)		
Economic migrant (reference: family reasons)					-0.176	
					(0.198)	
Migrant*0-14 years						-1.015
						(1.550)
Migrant* 25-40years						**-0.491*** **
						(0.184)
Migrant*40-55 years						0.0788
						(0.233)
Migrant*55+ years						-0.390
						(0.267)
Constant	6.169***	6.169***	6.169***	6.169***	6.176***	6.169***
	(0.0209)	(0.0209)	(0.0207)	(0.0209)	(0.0206)	(0.0206)
Observations	956	956	956	956	935	956
R-squared	0.105	0.105	0.116	0.105	0.084	0.132

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

Table 13: Exit reason of "decision-making" movers

	Male		Female		Total	
Exit reason	**No.**	**%**	**No.**	**%**	**No.**	**%**
Mariage	14	18.4	38	47.5	52	33.3
Divorce	12	15.8	19	23.8	31	19.9
Child fostering	3	3.9	4	5.0	7	4.5
Migration for job search	16	21.1	6	7.5	22	14.1
Migration for studies	6	7.9	3	3.8	9	5.8
Migration for land search	15	19.7	3	3.8	18	11.5
Other/unknown	10	13.2	7	8.8	17	10.9
Total	**76**	**100**	**80**	**100**	**156**	**100**

Table 14a: Probability of leaving the village between 1995 and 2005 and baseline characteristics (Logit estimation)

	(1)	(2)
VARIABLES	**Migrant** *Household level sample*	**Migrant** *Full sample*
Individual characteristics		
Male	**-0.831*** **	**-0.339** **
	(0.255)	(0.156)
Age	-0.0399	0.0271
	(0.0394)	(0.0180)
Age²	0.000406	-0.000318
	(0.000469)	(0.000255)
Education (deviation to age mean)	0.00903	-0.0162
	(0.0505)	(0.0387)
Education²	0.00815	0.00549
	(0.0120)	(0.0105)
Number of biological children residing in household	-0.0792	-0.118
	(0.0874)	(0.0881)
Age rank among children aged 5-15	-0.0988	-0.0709
	(0.130)	(0.0506)
Household characteristics		
Per capita income	-9.04e-05	-0.000326
	(0.000132)	(0.000224)
Age of household head	0.0362	0.0491
	(0.0522)	(0.0543)
Age² of household head	-0.000405	-0.000582
	(0.000493)	(0.000539)
Education of head (years)	0.00983	0.00796
	(0.0533)	(0.0508)
Female head of household	-0.924*	-0.364
	(0.527)	(0.504)
Link to head of household		
Head of household or spouse	**-1.098***	**-1.534*** **
	(0.665)	(0.536)
Child of head of household	-0.568	**-1.036*** **
	(0.467)	(0.349)
Other related	**-1.811*** **	**-1.674*** **
	(0.667)	(0.469)
Ethnic group		
Merina	0.225	0.122
	(0.311)	(0.328)
Sakalava	-0.114	0.133
	(0.411)	(0.482)
Antesaka	**1.282*** **	**1.320*** **
	(0.350)	(0.353)
Otherethnie	0.921	0.812
	(0.562)	(0.495)
Constant	0.464	-1.142
	(1.365)	(1.394)
Observations	479	1068

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

Table 14b: Semi-parametric difference-in-difference estimation (with individual fixed effects)

	(1)	(2)
Variables	**Log income**	**Log income**
	Household level sample	*Full sample*
Migrant	**0.306*** **	**0.314*** **
	(0.111)	(0.0744)
Year 2005	**0.171** **	**0.185*** **
	(0.0706)	(0.0362)
Constant	6.137***	6.041***
	(0.0275)	(0.0158)
Observations	954	2126
R-squared	0.101	0.110

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

Table 15: Impact of migration on other measures of welfare

	(1)	(2)	(3)	(4)	(5)	(6)
Variables	**2005 Log consumption**	**2005 Log consumption**	**2005 asset score**	**Asset score** *Initial household fixed effects*	**Asset score** *Individual fixed effects*	**Per adult equivalent log income** *Individual fixed effects*
Migrant	**0.191*** **	**0.181*** **	**3.193*** **	**3.313*** **	**3.179*** **	**0.228*** **
	(0.0530)	(0.0532)	(0.504)	(0.489)	(0.285)	(0.0671)
Male	-0.0181	-0.0118	-0.0443	0.0392		
	(0.0294)	(0.0282)	(0.165)	(0.0504)		
Age	**0.953*** **	**1.073*** **	**-5.004*** **	**-0.0202** **		
	(0.360)	(0.362)	(1.871)	(0.00801)		
Age^2	-0.00385	-0.00480	**0.0572** **	**0.000206** **		
	(0.00505)	(0.00506)	(0.0286)	(9.49e-05)		
Education (deviation to age mean)	-0.00731	-0.00925	0.106***	0.0303**		
	(0.00880)	(0.00882)	(0.0401)	(0.0147)		
Education^2	0.00273	0.00284	-0.000797	0.00229		
	(0.00192)	(0.00191)	(0.0107)	(0.00415)		
Single	**0.250*** **	**0.253*** **	-0.347	**-0.247***		
	(0.0617)	(0.0638)	(0.321)	(0.146)		
Widow/divorced	**0.193***	0.166	-0.268	-0.117		
	(0.103)	(0.106)	(0.408)	(0.170)		

(Table 15: cont.)

Age of household head	-0.756	-0.815	-3.643			
	(1.034)	(1.027)	(5.970)			
Age² of household head	0.00778	0.00762	0.0370			
	(0.0108)	(0.0107)	(0.0592)			
Education of head (years)	0.0108	0.00961	0.0752			
	(0.0113)	(0.0115)	(0.0579)			
Female head of household	-0.0482	-0.0705	0.521			
	(0.119)	(0.119)	(0.466)			
Log 1995 income	0.0605					
	(0.0586)					
1995 asset index		**0.0435*** **	**0.809** **			
		(0.0167)	(0.410)			
Year 2005				**0.877*** **	**0.910*** **	**0.204*** **
				(0.0721)	(0.0370)	(0.0254)
Constant	5.198***	5.574***	2.149	-0.313	-0.716***	6.387***
	(0.439)	(0.226)	(1.412)	(0.190)	(0.0375)	(0.0123)
Observations	1063	1068	1068	2136	2136	2131
R-squared	0.060	0.068	0.270	0.411	0.442	0.108

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