Migrant Destination Choice: A Place Utility Approach in Burkina Faso

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INTRODUCTION

Characteristics of places of residence are known to play a major role in the migration decision-making process (Gardner 1981; Hugo 1985; Findley 1987; Lucas 1997). Although a large amount of research has been conducted on the factors influencing the *decision to leave,* few studies have tackled the factors determining the *destination* of migration (Bilsborrow 1984; Oberai and Bilsborrow 1984; Barber and Milne 1988; Funkhouser and Ramos 1993; Duncombe, Robbins et al. 1999). One of the most well-known theories of migration which includes characteristics of places of residence is the push-pull model of Lee (1966), in which migration is seen as a response to factors of repulsion at the origin (such as poverty or population pressures on land resources), and forces of attraction at the destination (such as better employment opportunities or amenities).

In the cost-benefit model of Sjaastad (1962), migration decisions depend on the (discounted) stream of earnings anticipated in alternative locations compared with that obtainable in the current location, taking into account the costs of movement. Compared to the push-pull model, the Sjaastad model is attractive because it recognizes the effect of the individual characteristics of potential migrants (Rhoda 1983). Individual characteristics can be seen as "filters" through which information about potential movers' present location and potential destinations passes (Hugo 1981). Perceptions of the same factors can vary considerably from individual to individual according to level of education, aspirations, and awareness of opportunities elsewhere. But a person's decision to migrate is influenced both by his/her own characteristics and attitudes but also how these are conditioned by household and community factors (Bilsborrow, Oberai et al. 1984; Massey, Arango et al. 1993). For example, the existence of family members and friends (in the current area of residence and in the alternative destinations considered) is also usually a powerful factor in stimulating or restricting migration and in directing

migration (Hugo 1981; Massey, Arango et al. 1993; Bilsborrow 1994; Curran and Rivero-Fuentes 2003; Curran, Garip et al. 2005).

The concept of "place utility" was first used in a migration context by Wolpert (1965) and later elaborated mainly by other geographers, such as Brown, Horton and Wittick (1970). Recently, Junming (1997) wrote that "with microeconomic models, it is impossible to predict the strength and direction of the relationship between the likelihood of migration and individual variables in the absence of information on the social, economic and historical conditions of places of origin and destination". Meanwhile, interest in the effects of context on individual and household migration decisions developed rapidly (Wood 1982; Bilsborrow, Oberai et al. 1984; Bilsborrow, McDevitt et al. 1987; Findley 1987; Massey 1990, etc.). The growing interest in the effects of context on demographic behaviour contributed to the development of statistical tools such as multilevel models which made it easier to investigate the effects of context, and led to the inclusion of community-level questionnaires in surveys, beginning with the World Fertility Survey (see (Casterline 1985), the NASA survey in the Ecuadorian Amazon (Bilsborrow, Barbieri et al. 2004), a survey in Nepal (Axinn, Barber et al. 1997) and more recently the Demographic and Health Surveys. This survey-based approach overcomes a serious limitation of the place-utility approach, which focuses upon determining or comparing the perceived utility of alternative places of residence. This is extremely difficult to determine in surveys--even in specialized migration surveys - because of its subjectivity (Bilsborrow 1994).

Empirical applications have showed recently that contextual factors at the origin influence migration decisions but very few studies have examined the effects of factors at the destination. To do that requires a good set of fine-resolution data. For this reason, applications to date have almost exclusively concerned developed countries, such as studies on migration choice of retirees in the United States (Duncombe, Robbins et al. 1999) or the locational choice decisions of American youth in leaving the parental home (Garasky 2002). In developing countries, the few existing applications about the choice of destination are usually at a coarse resolution (provinces, regions). Funkhouser and Ramos (1993) use economic and non-economic factors to explain the choice of migration destination of Dominican and Cuban immigrants to the mainland United States and

Puerto Rico, while in Kenya, wages and employment at destination were found more important than at origin to explain migration (Barber and Milne 1988). Intervening opportunities (Stouffer 1940; Stouffer 1960), measured as the value of the variable in all regions other than the origin and the destination, were also significant. The conclusions of Shen (1999) on China are similar: push mechanisms operate weakly on interregional migration. By studying the factors influencing village settlement in Thailand, Entwisle et al. (2004) provide broader clues about the destination choice decision in rural areas of developing countries, finding the availability of suitable land for cultivation, proximity to water, markets and prices, road access, and proximity to other villages and towns all important factors in destination choice decisions of migrants.

OBJECTIVE AND CENTRAL HYPOTHESES

Faced with the lack of empirical applications in developing countries, the objective of this study is to understand how contextual factors at the destination influence migration decisions in a West African country. This paper thus explores the extent to which geographic, economic and environmental characteristics determine the destination choice of migrants, with Burkina Faso as a case study.

Intuitively, hypotheses about the effects of pull factors (which attract migrants to a particular destination) can be inferred from what is already known about push factors (which encourage migrants to leave a place). These hypotheses can be broadly divided into those related to the ecological context and those related to the economic context.

HYPOTHESIS (1): A FAVOURABLE NATURAL ENVIRONMENT IS AN IMPORTANT PULL FACTOR FOR MIGRANTS.

This is a highly plausible hypothesis, especially in the Burkinabè context, where rain-fed agriculture is the main source of livelihood, and natural resources are marginal in a large part of the country. Land availability, soil quality and rainfall conditions (quantity and inter-annual variability) are thus expected to play a significant role in the migrants' choice of destination. In Burkina Faso, rainfall deficits, shortages of land and unfavourable ecological features (such as poor-quality overexploited land and declining natural resources) at the place of origin have already been shown to be important push

factors (Mathieu 1998; Henry, Boyle et al. 2003; Henry, Piché et al. 2004; Henry, Schoumaker et al. 2004). This study aims to assess whether the opposite conditions act as pull factors, attracting migrants to more favorable regions.

HYPOTHESIS (2): ECONOMIC DIVERSIFICATION OF PLACES IS AN IMPORTANT FACTOR ATTRACTING MIGRANTS.

The local economic context is known to be a major factor influencing the decision to migrate (Amin 1974; DaVanzo 1981; others cited above). In Burkina Faso, 90% of the population is engaged in agriculture (INSD 2000), but the agricultural economy is highly vulnerable to several factors, including drought and changes in international markets, which force people to cope with high levels of production and income uncertainty. However, whether the diversification of economic activities and modernization of agriculture in an area encourages or deters migration is an open question. Thus some scholars have found that the availability of local work outside the agricultural sector (such as in services, construction, mining, commerce or manufacturing), especially in nearby towns, can help retain migrants in rural areas (Haggblade, Hazell et al. 1989; Junming 1997; Katz 2000). In contrast, others have found that the presence of such alternative activities can actually stimulate migration, either by providing individuals and families with the financial means to move (Rhoda 1983; ILO 1998) or the work experience and/or tastes for non-agricultural work (Bilsborrow, McDevitt et al. 1987; Laurian, Bilsborrow et al. 1998). Previous research on Burkina Faso on migration to cities appears to support the latter view (Beauchemin, Schoumaker et al. 2003).

DATA

One reason the type of study here has not been carried out before is the lack of accurate fine resolution data, all the more so in an African setting. To better understand how the choice of destination is influenced by the characteristics of places, a multi-level approach is needed, with data at both individual and community levels (Bilsborrow 1998). In addition, because migration can be a response to *changing* conditions (whether individual or contextual), a longitudinal approach is preferable. This paper benefits from reliable, multi-source longitudinal data, as discussed below.

1. **Individual data** were provided by a nationally-representative, retrospective survey on migration, conducted in 2000 by the Unité d'Enseignement et de Recherche en Démographie[3] at the University of Ouagadougou, the Demography Department of the University of Montreal, and Centre d'Etudes et Recherches sur la POpulation pour le Développement (CERPOD) (Poirier, Piché et al. 2001). 3,570 households were sampled in eight strata chosen according to geographic, climatic and ethnic criteria and respecting provincial divisions. From these households, each individual between 25 and 64 years of age and one of every two aged 15 to 24 were interviewed. This way we avoided a high number of censored histories of working age persons, which occurs in many studies of internal migration as they limit themselves to investigating the out-migration of young persons from households, such as sons and daughters (e.g., Laurian, Bilsborrow et al. 1998). Nevertheless, the age group 15-24 represents an important part of the Burkinabè population and thus is included here as well despite its incomplete migratory life. A total of 9,612 individual life histories were collected in the retrospective survey, including on out-migrants from households for whom information is limited to what was provided by other household members. Except for this latter out-migrants (not used in this analysis), data were directly provided. This implies that the data are more reliable that those from proxy respondents, as commonly collected in others studies.

The household questionnaire included questions on the characteristics of household members and former member (out-migrants), housing quality and location, household economic assets, and land ownership and use. The detailed individual questionnaire covered family origins, migration histories (date and place of each place of residence, ownership status, land access, motive for each move, etc.), as well as employment, marriage and fertility histories.

2. **Community-level data** came from one of the first national-scale retrospective community surveys, which was conducted in 600 settlements in early 2002 (Figure 1) (Schoumaker, Dabire et al. 2006). The survey was linked to the individual migration survey, comprising a third of all villages cited in any context in the individual survey, i.e., all villages in which people lived at the time of the survey and a large sample of villages

[3] The current Institut Supérieur des Sciences de la Population (ISSP)

in which they lived in the past. The questionnaire covered a broad range of topics, including land availability, transportation, agriculture, infrastructure, and employment opportunities. Efforts were made to obtain retrospective information dating back to 1960 from groups of community informants (administrative representatives, village chiefs and other knowledgeable informants). Settlements covered by the community survey cover all the country but do not constitute a random sample: only 6% of small villages of Burkina Faso (<5,000) were sampled, 60% of villages (5,000 – 10,000), and 86% of towns (>10,000).

3. In addition, **rainfall data** covering the 1960-1998 period were obtained from the global monthly precipitation data produced by the Climatic Research Unit at the University of East Anglia (New, Hulme et al. 2000). These data have been interpolated from a network of stations at a spatial resolution of 0.5 degree latitude and longitude, and are linked to the survey community data.

METHODOLOGY

In studies exploring the effects of contextual factors on migration, migration is often analyzed in term of flows between large areas, such as regions, provinces or states, as data on destination choice are often available only at such a level. Yet migrants rarely consider entire provinces as their potential destinations, their interest instead focusing on smaller spatial entities within a province, such as a particular village, town or city (Kanaroglou and Ferguson 1998). In this paper, the risk of migration by an individual is modeled - at every point in time - as a function of characteristics of the place at origin and the place at destination. Individuals are assumed to migrate to seek to improve their situation, or level of utility, based on perceptions which are shaped by a mix of personal attributes and destination characteristics.

THE RANDOM UTILITY MODEL

The introduction of the characteristics of destination places is made by using a random utility model, which assumes that an individual is able to evaluate the utility associated with each potential destination and to choose the place that maximizes his/her

utility (Sjaastad 1962; Gordon and Vickerman 1982; Davies, Greenwood et al. 2001; Knapp, White et al. 2001). In fact, the destination chosen may not have the maximum utility – other destinations may yield a higher utility but are not evaluated (Pellegrini and Fotheringham 2002).

In the general model used, an individual at place i faces j choices, including not migrating or moving to a different location (Davies, Greenwood et al. 2001). Suppose the utility level of place j for this individual in i is designated by:

$$U_{ij} = \beta' X_{ij} + \varepsilon_{ij} \quad (1)$$

where X_{ij} is a vector of choice-specific attributes for comparing place i to j alternative destinations considered, and epsilon is the randomly distributed error term for each individual for each destination pair. If the individual chooses destination j, then the utility U_{ij} must implicitly be perceived as the highest among all j choices (i.e., $U_{ij}>U_{ik}$ for all $k\neq j$). Thus, when choice j is made, the statistical model for the probability of moving from area i to area j can be represented as

$$P(y_i=j) = P(U_{ij}>U_{ik}) \text{ for all } k\neq j \quad (2)$$

THE SET OF ALTERNATIVE CHOICES

In theory, *all* potential destinations are taken into account and not only those chosen by the migrants. However, researchers typically do not have the possibility of collecting information on all potential alternatives (Davies et al., 2001), nor can it be argued that the individual is able to evaluate them all (Thill 1992). Thus it is far more realistic to assume the individual considers only a portion of the universal set. Therefore, the *a priori* likelihood that the true set of options from which selection is made is misspecified by the analyst is inherently much higher with a large choice set than with a small choice set. In this study as in all studies that are not prospective (and even there, data would not likely be comprehensive due to respondent error) the choice set is not known, with only the origin and the actual destination being known. So how can the respondent choice set be modeled?

In this study, the list of destinations considered for each person is taken to include the actual destination plus a random sample of *nine non-chosen alternatives* from the true complete choice set compiled from all destinations. It has been proved that, under certain reasonable conditions, the approximation of the true choice set by a subset does not jeopardize the consistency property of a choice model's estimates (Baydar, White et al. 1990; McFadden's, 1978 cited by Thill 1992). However, in contrast to the case of choice-set misspecification, the consistency of parameter estimates is adversely affected when the choice set defined by the analyst includes options not evaluated by the decision-maker (William and Ortuzar, 1982, cited by Thill, 1992). How to overcome this? Perhaps the best way is to include in the survey choice set all residences *ever visited* by anyone in the sample of migrants, over a long period of time. In fact, we can do something close to this, as the community survey in this study is not based on random communities in the study region but rather on all destinations previously ever lived in for at least three months (see section below) by at least three migrants in the survey at any time over the period from 1960 to 2000. This set is likely to be close to the complete set actually considered by sample migrants and non-migrants.

DEFINITION OF MIGRATION

In this study, we focus on the last *male* migration before the survey, over the previous 10 year period (1990-2000). The analysis is restricted to male migration because females are frequently passive in the migration decision in Burkina Faso (Le Jeune 2003). The focus on the *last* migration is based on concern about the reliability of responses farther back in time, related to the memory of respondents in retrospective surveys (Som 1973). The sample is also restricted to persons 15 and over, taken to be the age at which participation in decision-making commences.

Migration is defined here as a *change of residence involving a departure for a duration of at least three months*[4]. The summary migration matrix (Table 1, including 1272 migrants and 2676 non-migrants) shows that abroad (mostly males returning from

[4] A 3-month migration definition was used to include both temporary migrations in the dry season and migration related to short-term activities in urban areas (Poirier et al., 2001).

working on cotton plantations in neighboring Ivory Coast) is the most frequent origin among the last migration movements in the reference period from 1990 to 2000 (56.1 %), followed by migration from rural areas (27.0 %). The flows are directed largely to rural areas (70.8 %). Migration to the two major cities is only 16.0 % of the last movements. Note that migration movements *to* other countries are not covered by the survey, as people were interviewed in their place of destination, in Burkina Faso only. Note that the migrants themselves were interviewed in their place of destination, providing much more accurate and complete data that if data were collected from proxy respondents. Because of a lack of community data, the two main cities and (of necessity) "abroad" were excluded from the analysis here. In any case, factors explaining migration to the two cities are likely to be quite different from those explaining migration to small localities.

We thus focus here on migration from villages and medium-sized town to other villages or towns. A village is a settlement with less than 10,000 inhabitants, while medium-sized towns are all settlements with more than 10,000 residents, except Bobo-Dioulasso and Ouagadougou, the two main cities. In this sample, two-thirds of the migration is from one village to another (Table 2), with one fifth from villages to towns and half that from towns back to villages. Return migration, defined as a move to the village lived in at age 6[5], comprises a third of all moves. A priori, the likelihood of returning is higher if the village was better-off than if conditions were difficult. However, Beauchemin et al. (2007) found that out-migrants from these more developed origins (usually larger) are likely to search for an even better place when leaving their destination, and are hence less like to return to their origin compared to out-migrants from small villages.

The factors driving migration likely differ for short- and long-distance movements. In short-distance moves, migrants are likely to have a better knowledge of the destinations than in long-distance moves. In addition, migrants are likely to more easily and frequently keep contact with their origin family and community. Although not a perfect measure of proximity, a dummy variable indicating if the migration involved crossing the province boundary is used to distinguish two types of movements. Inter-

[5] In the EMIUB survey, only the birth department was collected, not the village.

province migrations are in fact slightly more common than intra-province moves (Table 2).

Each individual at least age 15 is "followed" from his next to last residence in a village/town until his last migration to a village/town, or until the time of the survey (2000) (Figure 2, type B). If the individual did not leave his village/town between 1990 and 2000, he is included in the sample as a non-migrant (Figure 2, type A). The data are organized in a person-period data file in which each line represents a three-month period, and the dependant variable indicates if a migration occurred during each three-month interval. The life history of each male is copied 9 times to include the 9 random non-chosen alternatives of destination in addition to the chosen destination. Overall, the sample consists of 1,801 men and approximately 600,800 person-periods.

ESTIMATION OF MODELS USING AN EVENT-HISTORY APPROACH

We use binary and multinomial logistic regression methods considered to estimate discrete-time event history models (Allison, 1995). Models that do not distinguish among the event types are fitted with binary logistic regression. The statistical model is specified as follows:

$$\log\left(\frac{p_{ti}}{1-p_{ti}}\right) = \alpha_t + \beta'.\mathbf{X}_{\mathbf{ti}} \tag{3}$$

where p_{ti} is the conditional probability that individual i experiences the event (last migration) at age t, given that the event has not already occurred. α_t represents the baseline hazard function, and $\boldsymbol{X_{ti}}$ is a vector of individual and contextual covariates. Both time-constant and time-varying covariates are included.

Multinomial logistic regression is used for competing risk analyses that distinguish among the types of migration (intra-province or inter-province move). The discrete-time competing risk model assumes that the log-odds of experiencing an event of type r rather than an event of type s (the reference category) at time t is given by:

$$\log\left(\frac{p_{rti}}{p_{sti}}\right) = \alpha_{rt} + \beta_r'.\mathbf{X}_{\mathbf{rti}} \tag{4}$$

where p_{rti} is the conditional probability of an event of type r occurring at time t for individual *i*, given that no event has occurred prior to time t. α_{rt} represents the baseline hazard function for an event of type r, and $\boldsymbol{X}_{rti}$ is a vector of covariates. Censored cases (no migration) are treated as the reference category, and each type of migration (intra- or inter-province) is distinguished as a separate event. All models take into account the fact that the data are clustered, and the standard errors of the regression coefficients are adjusted accordingly using Huber-White standard errors (Hox 2002).

EXPLANATORY VARIABLES

Table 3 indicates the characteristics of the sample as a whole[6] and of migrants[7], based on the individual-level variables included in the analysis, showing the selectivity of migration. After discussing these data, we describe the hypotheses pertaining to the contextual variables and present the data in Table 4, comparing variables for villages/towns at origin and destination with values for all localities taken together in Burkina Faso. Note that because characteristics of localities at the origin and destination are taken into account *at the time of migration*, a locality chosen by two migrants is counted two times in the sample (viz in the sample sizes of origins and destinations in Table 4) because the two migrations may have occurred at two different time periods. This is the reason that the number of medium-sized towns in the destination sample is higher (71) than in the total Burkinabè reference sample (55). Characteristics at the origin are provided for comparison. For the sake of parsimony, only the most significant results about destinations are discussed in this section. Finally, household-level factors may well also be important determinants of migration, but only two time-varying household-level variables were collected in the survey (household size and age of each member), and neither was found significant in this study, so they are excluded in the final model.

[6] At the arrival in the next to last residence, when people began to be at risk.

[7] At the time of the last migration.

INDIVIDUAL LEVEL VARIABLES

In virtually all studies, age has been found linked to migration, which is also the case here: the propensity of migrating is high between 15 and 39 but decreases sharply after that (see Table 3). In the multivariate analysis, the non-linear relationships between age and the risk of migration are modeled by age and its logarithm. These two measures form the baseline hazard of migration.

As shown in numerous migration studies, education is positively related to migration, especially for migration to urban areas (Lututala 1995; Todaro 1997). This is confirmed also for Burkina Faso from the sample here: 20.7% of migrants have a primary level education compared to only 15.5% in the population at risk. Education is measured by a time-constant variable, being the level attained by the individual at age 15[8].

The majority ethnic group in Burkina Faso, the Mossi, differs from the other ethnic groups in propensity to migrate. The Mossi live mainly on the densely populated Central Plateau (called in fact the Mossi Plateau), but are also known for migrating to the southwestern regions (Marchal, 1975; Mathieu, 1994). They constitute 44% of the analysis sample but 48% of migrants. The Fulani are also relatively mobile (12 % of the sample but 16% of the migrants), living in the northern and eastern parts of the country where they are engaged mainly in cattle-raising (Hampshire and Randall 1999). The third category, comprising 10 ethnic groups (including the Senoufo, the Gourmantche and the Gourounsi), constitutes 44% of the analysis sample but only 36% of the migrants.

Finally, the principal activity performed by each person at each point in time is included in the models. People engaged in activities other than agriculture and cattle-raising (such as students or those making handicrafts or in small-scale food trading) are expected to be more mobile. Indeed, they constitute only 11% of the sample but 34% of the migrants. On the other hand, farmers and cattle-raisers are expected to have a low propensity to migrate because of their attachment to the land. They make up, respectively, 80% and 8% of the sample but only 59% and 6% of the migrants, respectively.

[8] Educational level rarely changes after age 15 in Burkina Faso (outside the two main cities).

HYPOTHESIS 1: RAINFALL CONDITIONS

The first hypothesis is tested using two variables - mean annual rainfall over the 1960-98 period (Figure 3) and an indicator of recent drought, measured as the percent of normal precipitation over the three years preceding the survey. These two variables, measured at the department level, were used in a previous study to capture two dimensions of the potential impacts of rainfall on out-migration. They were found to be significant predictors of poor harvests (Henry et al. 2004b).

The first variable (mean annual precipitation) may be considered a good indicator of overall agricultural productivity and vulnerability to drought of an area in Burkina Faso. Four categories of rainfall corresponding to areas where crops with similar yield responses to water are cultivated (Doorenbos and Kassam 1987) are compared: less than 500 mm per year, 500 to 699 mm, 700 to 899 mm, and more than 900 mm (see Table 4). A previous study found that people living in drier regions are more likely to leave their villages for another village than those living in wetter regions (Henry, Schoumaker et al. 2004). Thus the hypothesis is that, controlling for other factors, people tend to move to areas with rainfall conditions more favorable than those in their place of origin. Nevertheless, this hypothesis has not been tested because it requires the use of a variable comparing origin and destination characteristics. This kind of variable has not been introduced as we wanted to test push and pull effects separately and because of the difficulty to quantify the gain compared to origin characteristics. In addition, this subjective expectation is likely to be different for individual.

The second variable is a time-varying variable indicating the extent to which rainfall in the department over the *three preceding years* differed from the long-term average. The measure is the ratio of mean rainfall over the three preceding years[9] to mean rainfall over the 1960-1998 period, in three categories (less than 85 %, 85 to 94 %, and more than 95 %). Short-term unfavorable rainfall conditions were found in earlier work to push men to leave for other rural areas, but delayed moves to urban areas (Henry et al.,

[9] People may be able to cope with one poor harvest without resorting to migration (for more details, see Henry et al., 2004b).

2004b). Migrants in this study are thus expected to choose to migrate to other rural areas if rainfall conditions in the three preceding years were unfavorable.

No major differences were found in rainfall characteristics of villages overall but medium-sized towns at the destination seemed to have more favorable rainfall in general. Thus 93% of medium-sized towns chosen as destinations by sample migrants are located in the 700-899mm agro-climatic region, compared to 60% for Burkina Faso as a whole. In terms of rainfall deficit, 87% of medium-sized towns chosen as destination experienced normal rainfall during the year of migration (over 95% of the 1960-98 rainfall mean), compared to 66% for the country as a whole.

HYPOTHESIS 2: ECONOMIC DIVERSIFICATION

Economic diversification of villages/towns is expected to attract migrants. Many households thus engage in small-scale, non-farm income-generating activities to ensure food sufficiency (Ward, Ballif-Spanvill et al. 2004).

The first variable to be tested here is the presence of (vegetable) gardening in the community. In Burkina Faso, gardening vegetables for sale in the market is thought to have decreased the level of rural exodus, particularly among young men (Marceau Rochette 1989). For the country as a whole, 34% of the villages and 96% of the medium-sized towns have gardens (green beans, tomatoes, onions, etc.). Migrants are thus expected to choose destinations where gardening is available. Indeed destination villages of migrants are distinguished from reference villages by a higher proportion of gardening (45.5% vs. 34.5 %).

Growing cash crops (mainly cotton) is thought to be a factor influencing internal migration by attracting migrants searching for small private plots. A previous study found cotton yields high in provinces at destination and low in provinces at origin (Henry, Boyle et al. 2003), and literature exists on the apparent role of cotton cultivation in migration since a large part of the country's foreign exchange earnings (60%) comes from cotton (Ouédraogo 2003). The second variable is thus the presence of a cash crop (cotton or rice) in the village/town: 18% of villages and 10% of towns reported a cash crop among their three most important crops. Villages at destination are more likely to

have cash crops (26.4%) than villages in Burkina Faso as a whole (17.6%) but less than origin villages (35.3%). The differences are far greater for towns: 76% of destination towns have cash crops compared to 17.1 % of origin towns and 10.3% of towns in Burkina Faso as a whole. It thus appears that cash crops are associated with migration to or between towns as destinations but not to villages.

The possibility of obtaining non-agricultural work (in services, construction, mining, commerce or manufacturing) in another village is a factor expected to attract migrants. When a drought occurs, men are likely to leave their villages in search of work (Glantz 1987). The third and fourth variables listed under H2 in Table 4 are thus the availability of paid farm employment and of paid non-farm employment in the village/town. From the data in the table, the former would appear to be a factor in retaining migrants in villages but attracting migrants to towns, while non-agricultural employment appears strongly associated with retention of migrants in medium-sized town (92% of the origin sample compared to 26% of the destination sample) and less strongly associated with retention in villages.

As agriculture is the main activity in Burkina Faso, the need for income implies that people seek to increase yields. The extent of modernization of agriculture is thus likely to be influential in the choice of destination. Four variables were introduced in the models to examine this: the use of ploughs (versus hand cultivation), the presence of a tractor, use of irrigation, and presence of water-conservation techniques. As these are measured at the community-level, the variables are implicitly assumed to be equal for all community members. In previous research in the neighboring country of Mali, families living in villages which had irrigated perimeters were *more* likely to have out-migrants (Findley 1992). The use of contour stone walls not only reduces erosion but improves the availability of water for cultivation by encouraging infiltration (Bandre and Batta 1998). Very simple to implement and relatively cheap, this soil and water conservation technique has been shown to significantly improve cereal yields in Burkina Faso (Marceau Rochette 1989; Bandre and Batta 1998).

As seen in Table 4, the use of tractors and ploughs is actually somewhat higher in places of origin than destination and higher in both than in the reference villages, but for

towns tractors use is higher in destination places than origins while use of ploughs is virtually universal in both. Irrigation is higher in origin than destination villages, while the opposite relationship appears in towns. On the other hand, the use of water conservation methods is just the reverse - higher in destination villages (and reference villages) than in origin villages but lower in destination than origin towns.

It should be noted that all variables explored in tests of the second hypothesis are time-varying.

ADDITIONAL CONTROL VARIABLES

Three additional control variables were included in the models. One is the size of the settlement, categorized as (a) villages, or all places with fewer than 10,000 inhabitants, and (b) medium-sized town, or places with over 10,000 inhabitants (excluding Ouagadougou and Bobo-Dioulasso, the only two major cities in the country). We assume that larger population settlements are more likely to attract migrants, as in the traditional gravity theory of migration (Ravenstein 1889; Stouffer 1940).

While the two major cities are excluded from the analysis of migration, they may still influence migratory processes between other places. Thus migrants are likely to be attracted to places *near* the two largest markets in the country. To control for the absence of the two cities in the set of destination alternatives, the distance of the settlement (of origin or destination) to Ouagadougou or Bobo-Dioulasso was constructed using a Geographical Information System, with all places georeferenced with GPS. This made it possible to calculate the distance from every study village or town to whichever of the two cities is nearest. Three categories were created: less than 100 km, 100-199 km, and more than 200 kilometers from Ouagadougou or Bobo-Dioulasso[10].

Finally, the last variable indicates if the settlement had a road connection, which is assumed to increase the attraction of destination communities by making them more accessible (see, e.g., Bilsborrow and Ruiz-Pozo 1990on Ecuador). In Burkina Faso, 57%

[10] The size of the sample does not allow the use of finer categories.

of all villages are not connected by a road, but all medium-sized towns have a road of some kind (tar or non-tar).

MULTIVARIATE RESULTS

Several different models are developed to test the two sets of key hypotheses to explain the last migration decision in Burkina Faso. In Table 5, the individual-level variables were introduced as control variables together with the community-level variables. In model 1, all moves are included. As mentioned above, we expect the driving factors of migration to differ for short- and long-distance movements, and hence present the results for intra- and inter-province migration separately. The results are presented in two separate columns (models 2a and 2b), each pertaining to the contrast between a single type of movement and no migration (reference).

In order to test for push and pull effects, variables at the origin and destination were then introduced into the statistical estimation models.

RESULTS FOR INDIVIDUAL-LEVEL CONTROL FACTORS

The odds ratios for individual-level control variables vary slightly in the models (Table 5), and are first briefly summarized. Age shows the expected curvilinear effects (falling with age in the interval 15-64, but rising at older ages and with a peak in age-at-migration at 30 to 39 years), and propensities to migrate are higher for people working in an activity other than agriculture or cattle-raising. Those engaged in cattle-raising are especially unlikely to migrate. The Fulani are the most mobile ethnic group, but tend to stay in their province of origin. Perhaps surprising, the effect of education on the propensity to migrate is not significant. This could be due to the definition of migration used in this study, as migration to the two main cities and abroad are excluded from this analysis. The positive relation between education and migration has been shown especially for migrations to urban areas in many studies (e.g. in Burkina Faso (Beauchemin and Schoumaker 2005).

RESULTS FOR HYPOTHESIS 1: RAINFALL VARIABLES

With all movements combined (Model 1), the risk (hazard) of the likelihood of leaving places with favorable rainfall conditions is actually surprisingly *higher* than that for localities with unfavorable rainfall. This result is unexpected and contrasts with previous results concerning the first migration after age 15 (Henry, Schoumaker et al. 2004). However, the analysis by type of movement indicates that this is true only for inter-provincial movements, for which the effects are quite strong and consistent (greater effect on discouraging migration the lower the rainfall). In Henry et al. (2004b), the odds of leaving the village for another village were three times higher for men living in the poorest agroclimatic region than for those living in areas with an average rainfall over 900 mm. One tentative explanation for these contrasting results could be that people making the first migration after the age of 15 are more similar to each other in their characteristics (in terms of age at the migration and motives for example) than people making the last migration before the time of survey. It could lead to the conclusion that the difference in propensities to move from a drier region compared to a move from a wetter region is higher for young migrants than for their elders.

Rainfall conditions in the three preceding years are not significantly related to intraprovincial movements. Nevertheless, the non-significativity of this variable is probably dependant on the low number of people by categories in the survey. As found before (Henry et al., 2004b), the odds ratios suggest that short-distance moves (within province) are highly sensitive to recent rainfall as expected. At the same time, long-distance moves are less likely when recent rainfall is scant. It could be an income effect. Rural people are waiting for good economic conditions in the preceding years before moving far, as they may need a production surplus to finance their migration.

Rainfall conditions of destination places also seem to be influential in migration decisions, particularly for short-distance moves, but the relationship is unexpected: people seem to be attracted by places with very low mean annual rainfall, that is, places in the less favorable agro-climatic zones. This could be explained by the high proportion

of return migrants in the driest region[11]. On the other hand, places with a rainfall deficit over the three preceding years at the destination tend not to attract migrants, as hypothesized. This underlines the importance of taking into account the temporal variability of the environment (the effect of drought). People seem to include rainfall conditions in their choice of destination only in the case of short-distance movements, probably because these migrants have a better knowledge of rainfall conditions of their closed environment.

RESULTS FOR HYPOTHESIS 2: ECONOMIC DIVERSIFICATION OF COMMUNITY

In a context of high vulnerability, economic diversification may be a crucial mechanism by which households cope with high levels of production and hence income uncertainty. The second hypothesis here is thus that the economic diversification of villages/towns is a factor of attraction for migrants. This hypothesis is tested in two parts. First, the effect of the presence of diverse income-generating activities in the settlement is introduced to explain the destination choice of migrants. The second part aims to test the effects of factors reflecting the modernization of agriculture at the destination.

HYPOTHESIS 2A : INCOME-GENERATING ACTIVITIES IN COMMUNITY

For these variables, results differ slightly by type of move. As a tool to complement other sources of household income, gardening in the community helps to retain migrants at the origin, keeping them from making long-distance (inter-provincial) moves. The presence of cash crops at the origin has a similar effect but is not quite statistically significant. On the other hand, the effects of paid employment (agricultural or non-agricultural) at the origin are *positive*, contrary to expectations, though not quite statistically significant at the 10% level. These effects may indicate that households in communities where such work exists are more likely to be engaged in paid employment

[11] Models without return migration have bee tested and the odds ratio for mean annual rainfall variable are not significant without them, unlike the model with return migration. However, the number of migrants by agro-climatic zones is very small here, making difficult to have significant results. More generally, it is a problem of this kind of study. Even with a large database including 10,000 people, we have few migrants by categories.

and hence be able to finance the cost of migration. However, there is probably a better explanation: engagement in paid work, especially non-agricultural work, provides people with not only paid work experience but may also generate greater tastes for wage work instead of farm work.[12]

At the destination, results found for this set of variables are generally symmetrical with those for the origin. Thus localities with gardening have a significant attraction for migrants but for inter-provincial moves only. Also as expected, the presence of cash crops at the destination tends to attract migrants, though the results are not quite statistically significant. In particular, cotton growing, and the cash incomes it generates, is known to attract migrants to the western and south-western parts of the country. And again, contrary to expectations, the presence of paid employment in destination communities (especially agricultural) was associated with *less* of a propensity to choose the locality as a destination. It is difficult to interpret this result, but it may be partly due to the crude way in which the variable is measured, simply as the presence of any non-agricultural employment rather than as a measure of the total number of different types of work or the percentage of the local population engaged in any non-agricultural employment, which would be much better measures. Another explanation could be that agricultural wage work is paid so poorly that it is not likely to attract workers.

HYPOTHESIS 2B: COMMUNITY MODERNIZATION OF AGRICULTURE

The presence of tractors at the origin is linked to less short-distance out-migration (intra-province), while the origin communities with some use of plows and access to irrigation are both statistically significantly linked to out-migration. We interpret this as meaning that these communities are better off so people are more likely to be able to afford to move. The presence of water-conservation techniques in the community of origin has the expected negative effects on out-migration, but the effects are not significant, in contrast to a previous study (Henry et al, 2004b). Such techniques, if they improve yields, may decrease the need for migration.

[12] This was the interpretation in a study of out-migration from rural areas of the Ecuadorian Sierra or highlands, in Bilsborrow et al. (1987).

At the destination, the presence of tractors attracts migrants, as anticipated, with the tractor linked to higher labor incomes and perhaps also seen as a symbol of high technology. The presence of plows has no effect, but irrigation at destination reduces the propensity of men to choose the locality for long distance, inter-provincial moves. Since irrigation is usually associated with higher yields and incomes as well as more intensive use of the land and hence higher demands for labor, the latter result is totally unexpected. Again, it may be partly due to poor measurement of the contextual variable - simply whether there is *any* irrigation in the community, rather than the *proportion* of land or farms irrigated. The results for the presence of a water-conservation technique are also unexpected: having such a technique in the community is associated with less in-migration rather than more, especially for short-distance moves. The latter could be explained by the fact that these techniques are used mainly where most needed, such as in over-crowded areas, such as the Mossi plateau.[13]

RESULTS FOR ADDITIONAL COMMUNITY VARIABLES

Migrants mostly leave villages to go to larger places, such as medium-sized towns, since this usually provides them with more diverse and higher paying employment opportunities, as well as other amenities, such as better access to schools, health facilities, etc. The results for the size of place of origin and place of destination provide powerful support for this expectation, consistent with the traditional gravity theory of migration, with large communities of origin having much lower out-migration while larger ones of destination attract migrants. The attraction of a town is 14 times that of a village in short-distance moves and 3 times higher for long-distance moves. On the other hand, the distance of the locality of origin or destination to Ouagadougou or Bobo-Dioulasso does not appear to significantly influence migration but odds ratios suggest that closer communities have less out migration since their migration is mainly to Ouagadougou and Bobo-Dioulasso. Similarly, destinations close to these two cities attract migrants because

[13] This is akin to the problem of assessing the effect of family planning facilities on fertility in situations in which the facilities are purposively located in areas of high fertility, making them endogenous (see Angeles, G., D. Guilkey, et al. (1998). "Purposive Program Placement and the Estimation of program Effects: The Impact of Family Planning Programs in Tanzania." Journal of the American Statistical Association **93**(443): 884-899.

the proximity allows people to commute to work. Finally, and as expected, the presence of roads at the origin facilitates out-migration but has little effect on directing migrants to destinations.

DISCUSSION AND CONCLUSIONS

Few studies have addressed the factors determining the destination of internal migrants, particularly in developing countries. This is a fundamental part of the decision-making process of migrants - together with why people leave their places of origin - so it is essential to understand migration movements, and moreover to predict migration movements and develop appropriate policies, for example, to improve conditions or infrastructure in types of communities of origin of out-migrants or not. This is especially important in a country such as Burkina Faso, characterized by low rainfall and recurrent periods of drought as well as widespread poverty and lack of development infrastructure. In this paper, we have explored the extent to which geographic, economic and environmental characteristics determine the destination choice of migrants in Burkina Faso. More precisely, two sets of hypotheses were tested: first, that a favorable natural environment is a major pull factor for migrants; and second, that economic diversification attracts migrants.

Logistical and multinomial logit models were used to test these hypotheses, drawing on detailed household and community survey data for Burkina Faso. By introducing characteristics at the origin and at the destination in the same model, this study compares the relative importance of push vs. pull effects in the same model. The choice of destination is modeled first for *all* moves, and then separately by type of migration: short-distance versus long-distance moves.

Push effects of migration in rural Burkina Faso are found here to include favorable mean rainfall, the presence of plows, irrigation and a road connection in the settlement. Larger size communities (towns), the presence of vegetable gardens, and having one or more tractors tend to retain migrants in places of origin, and attract them to places of destination. This symmetry is a strong indicator of the relevance of these factors in internal migration movements in Burkina Faso. Nevertheless, given the generally high

quality of data, especially for an African setting (fine temporal and spatial resolutions), the modest number of statistically significant findings in support of our main hypotheses is a bit disappointing and probably due to the small numbers of people by categories in the sample.

The use of a random utility estimation model theoretically requires data on *all potential destinations* and not only those actually chosen by migrants. This requirement does not allow us to include certain key variables in migration decision-making, such as the presence of relatives in the settlement, who often provide information prior to migration material support to migrants, such as helping them find work or housing. While the individual survey obtains this information, we do not have the same data for each individual nor of course for non-chosen destinations due to the design of the questionnaire: it only inquired about the presence of relatives or not in the actually chosen destination. While it is possible to collect and code information on the location of all close relatives, this would have been extremely time-consuming and expensive to collect.

The results of this paper should not be considered definitive, as several improvements are desirable. In their study of destination choices of immigrants from Ontario, Canada, Kanaroglou and Ferguson (1998) suggest analysing the behaviour of migrants by category or group, which allows formulating different models for each group to the degree it is thought that migration decision behavioral processes differ by group. As individual characteristics are filters through which information about potential destinations passes, such a study could be pursued by developing a typology of migrant groups according to certain key characteristics (such as main activity, ethnic group, age group, gender). However, the sample size of the survey used here is rather small to be disaggregating by categories.

The choice of destination may also differ according to the motives of migrants. The survey used in this study collected information about the motives for migration, but motives declared by respondents some years after the migration may not correspond to the actual underlying reasons for migration at the time of migration.

Another suggestion is given by Svart (1976): "not one of these studies clearly addresses the problem of separating the actual characteristics of places from the stated reasons for place evaluation" (Svart, 1976, p.317). The analysis of the differences between objective and subjective characteristics of potential places of destination calls for a survey focusing on perceptions, drawing more on the field of psychology.

Finally, there has been very little empirical research on the contextual determinants of migrants' choice of destination, leaving open many broad issues. For example, contextual effects likely do not act independently but rather together in some synergistic fashion. But it is hard to advance on the synergisms without having some clear results for particular contextual factors, as we have attempted to do here. In addition, Rudolph (1992, p.133) views economic and ecological factors "not as causal, but as delimiting factors which act as parameters within which there still remains a large area of play for other variables". Thus, in addition to the economic and environmental factors focused upon here, other variables should be taken into account, especially those related to the social context. Previous research on migration in Africa has shown that the migration decision process involves community groups and not only individuals and households (Guilmoto 1998; De Bruijn and Van Dijk 2003). It is possible that social networks, for instance, are even more important than the economic and geographic factors studied here in determining migrant's choice of destination. All these social, economic and ecological factors operate and interact at different levels (individual, household and community). To better understand migration decision-making processes, questions addressing these additional factors should be included in future migration surveys.

ACKNOWLEDGEMENTS

Research for this paper was supported by the Andrew Mellon foundation and by the Agence Universitaire de la Francophonie. The paper was written while the first author was at the University of North Carolina at Chapel Hill as a visiting Postdoctoral Fellow and completed at the Facultés Universitaires Notre-Dame de la Paix, in Namur (Belgium).

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Figure 1. The 600 Settlements in the Community Survey in Burkina Faso.

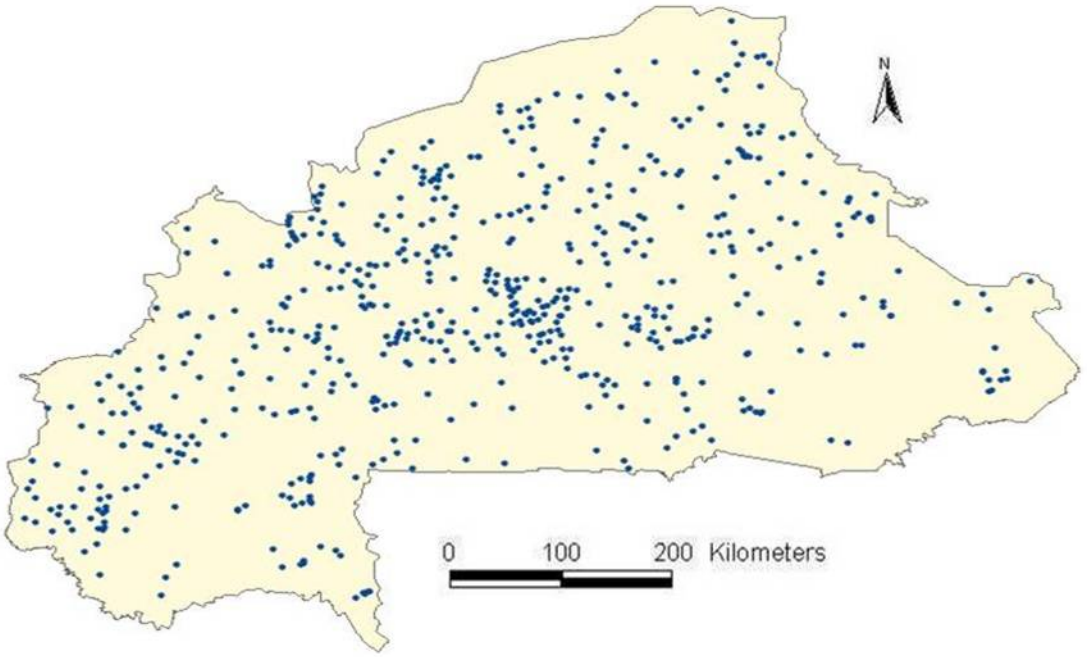
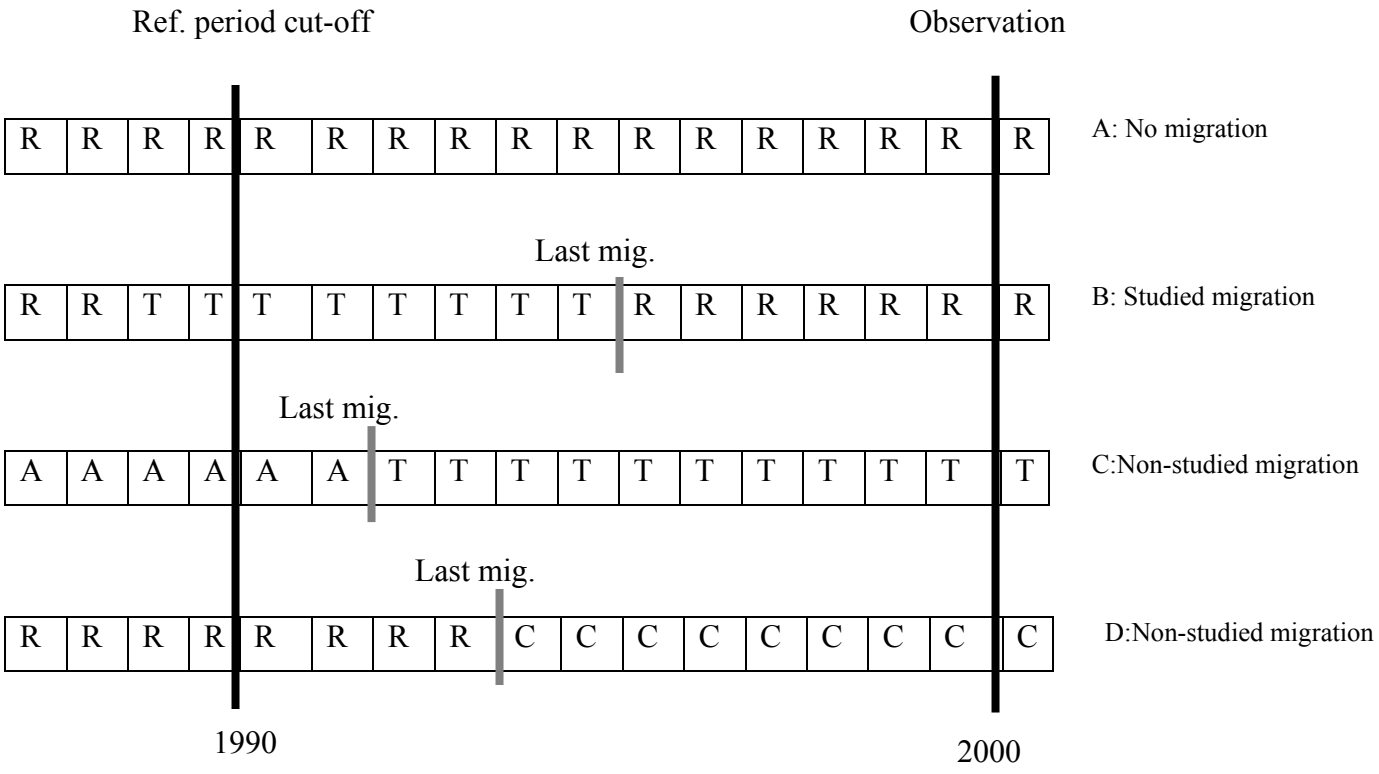


Figure 2. Residence Periods Included in the Database



R for a three-month residence in rural area
C for a three-month residence in Ouagadougou or Bobo-Dioulasso
A for a three-month residence abroad
T for a three-month residence in a medium-sized town

Figure 3. Map of Burkina Faso Showing Mean Annual Rainfall at the Department Level, 1960-98

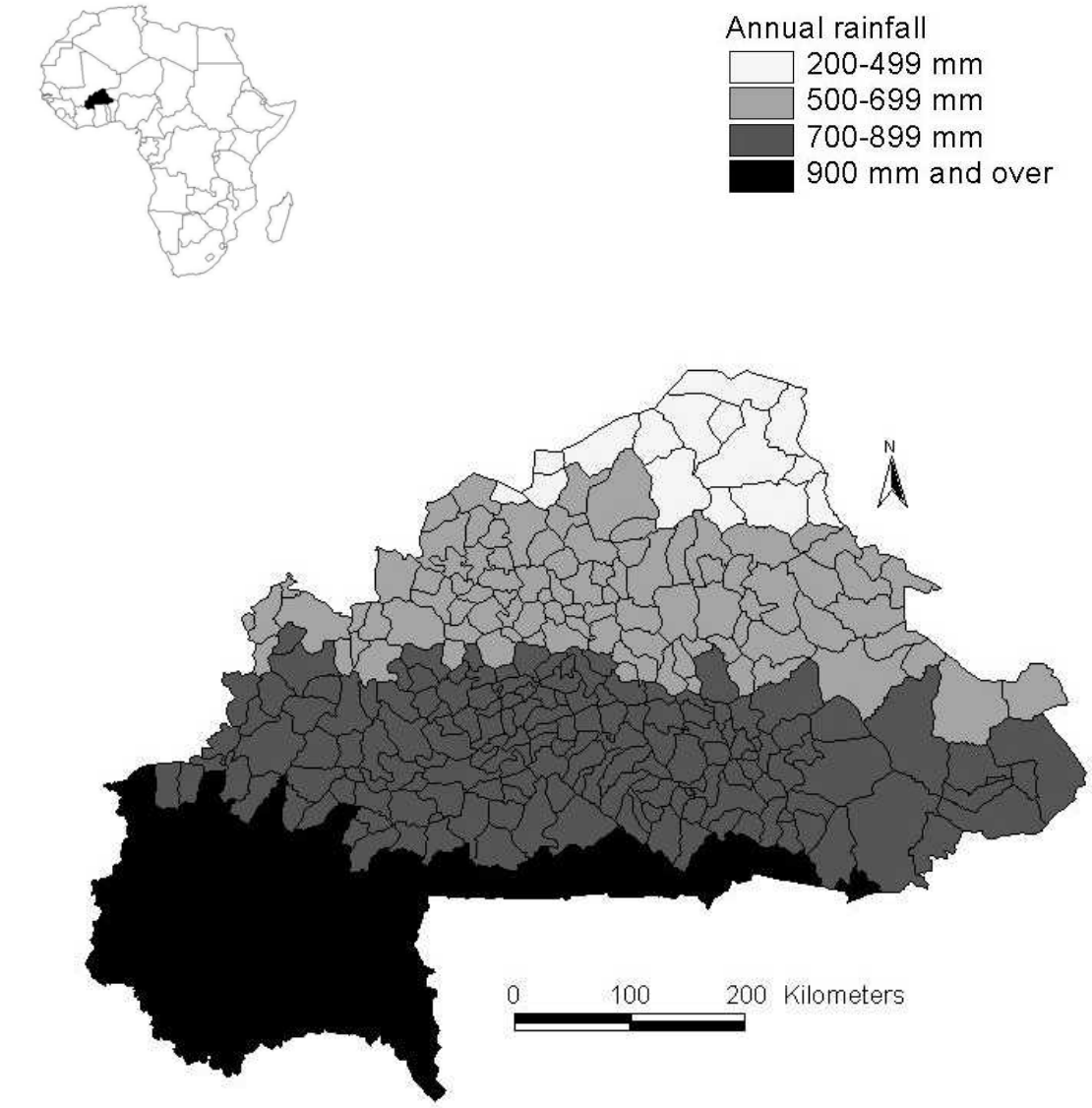


Table 1. Migratory Matrix of the Last Male Migration that Occurred from 1990 to 2000, expressed as percentages[14]

	Non-migrants	Destination			
Origin		Village	Medium-sized town	Ouagadougou/ Bobo-Dioulasso	Total
Village	48.6	16.6	4.9	5.5	27.0
Medium-sized town	10.6	2.4	1.2	3.3	6.9
Ouagadougou/Bobo-Dioulasso	40.8	5.1	2.6	2.3	10.0
Abroad	0.0	46.7	4.5	4.9	56.1
Total	100 % *(n=2676)*	70.8	13.2	16.0	100% *(n=1272)*

[14] Note that this migratory matrix is not representative of the Burkina Faso as this national survey was not designed to be representative of our four classes of residence but of eight strata chosen according to geographic, climatic and ethnic criteria and respecting provincial divisions.

Table 2. Characteristics of Last Male Migration

	% of sample
Origin and destination of migration	
Rural to rural	65.58
Rural to medium-sized towns	19.85
Medium-sized towns to rural	9.87
Medium-sized towns to medium-sized towns	4.69
Proximity	
Intra-provincial move	41.92
Inter-provincial move	58.08
Return migration	
No-return migration	66.82
Return migration	33.18
Sample size of migrants	217[15]

[15] Sample size of nonmigrants: 1584

Table3: Descriptive Statistics of the Sample

	Sample (1)	Migrants (2)
Age at migration		
15-19		14.6
20-24		14.8
25-29		14.3
30-34		17.4
35-39		17.5
40-44		5.0
45-49		3.2
50 and over		13.2
Education		
No education	84.5	79.3
Primary and over	15.5	20.7
Ethnic group		
Mossi	43.6	47.9
Fulani	12.1	16.4
Other	44.3	35.7
Activity (TV)		
Agriculture	80.6	59.5
Cattle-raising	8.1	5.9
Other	11.3	34.6
Sample size	1801	217

1. Descriptive statistics of the sample at the arrival in the next to last residence, when people began to be at risk.

2. Descriptive statistics of the sample at the time of the last migration (migrants).

TV means time-varying variable

Table 4. Characteristics of the Localities at the Origin and at the Destination (at the time of migration), Compared to all Localities in Burkina Faso (1990-2000), by Size of the Locality

	Villages[2]			Medium-sized towns[3]		
	Origin	Destination	Reference	Origin	Destination	Reference
H1: Rainfall variable						
Mean annual rainfall						
200-499 mm	3.5	7.1	4.3	3.7	0.0	0.3
500-699 mm	14.4	23.7	25.9	23.7	0.0	8.9
700-899 mm	64.4	43.8	43.9	53.5	92.7	60.6
900 mm and over	17.8	25.5	25.9	19.1	7.3	30.2
	100.0	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
Recent rainfall (TV)						
<85% of mean annual rainfall	0.7	1.0	0.9	0.0	1.7	2.4
85-94% of mean annual rainfall	25.0	36.4	32.4	48.8	11.5	31.3
95% and over of mean annual rainfall	74.4	62.6	66.8	51.2	86.9	66.3
	100.0	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*
H2: Economic diversification						
Income-generating variables						
Gardening[1](TV)	39.0	45.5	34.5	88.1	100.0	96.4
Cash crop[1](TV)	35.3	26.4	17.6	17.1	76.1	10.3
Paid agricultural employment[1](TV)	57.1	34.7	54.4	74.0	83.3	74.0
Paid non-agricultural employment[1](TV)	23.2	15.0	17.6	92.3	25.8	45.0
Modernization of agriculture						
Tractor[1](TV)	26.2	20.9	12.0	72.8	93.8	43.7
Plow[1] (TV)	93.6	84.2	74.4	98.3	100.0	99.7
Irrigation[1](TV)	21.9	0.0	6.8	66.8	85.9	21.8
Water cons. Techniques[1] (TV)	29.3	34.6	41.0	43.7	19.6	28.3
Sample	179	146	540	38	71[4]	55

[1] The figure indicates the proportion (expressed in percentage) of places with the presence of the activity or the tool.

[2] Villages are defined as a locality with less than 10,000h.

[3] Medium-sized towns include all settlements with more than 10,000h, except Ouagadougou and Bobo-Dioulasso.

[4] See p.12 in the text for further explanations.

(TV) means time-varying variable.

Table 5: Event History Models of Individual and Rainfall and Economic Contextual Effects on the Risk of Migrating (results expressed as odds-ratios)

	Explanatory variables (reference category)	Model 1 All moves	Model 2a Intra-prov. moves	Model 2b Inter-prov. moves
Individual variables	*Baseline hazard*			
	Age	0.86*	0.84	0.88*
	Log age	150.65*	334.79	66.43**
	*Education (*no education)			
	Primary and over	0.91	1.52	0.70
	*Ethnic group (*Mossi)			
	Fulani	2.35*	3.66*	1.76
	Other	0.68	0.76	0.63
	*Activity (*agriculture)			
	Cattle-raising	0.51	0.17	1.17
	Other	6.69***	4.74***	8.75***
Contextual environmental variables	**H1: Rainfall variables**			
	*Mean annual rainfall at the origin (*900 mm and over)			
	200-499 mm	0.12**	1.11	0.06***
	500-699 mm	0.20**	1.09	0.14***
	700-899 mm	0.39	3.17	0.17***
	*Recent rainfall at the origin (*95 and over)			
	< 85 % of mean annual rainfall	0.01	7.72	0.01
	85 – 94 % of mean annual rainfall	0.05	10.93	0.05
	*Mean annual rainfall at the destination (*900 mm and over)			
	200-499 mm	2.73*	5.49**	1.37
	500-699 mm	1.76	2.43	1.15
	700-899 mm	1.39	2.93**	0.94
	*Recent rainfall at the destination (*95 and over)			
	< 85 % of mean annual rainfall	20.98	0.06**	36.70
	85 – 94 % of mean annual rainfall	16.04	0.05	18.12

	Explanatory variables	Model 1 All moves	Model 2a Intra-prov. moves	Model 2b Inter-prov. moves
Contextual community variables	**H2a: Income-generating activities**[1]			
	Gardening at the origin	0.24***	0.63	0.15***
	Cash crops at the origin	0.60	0.85	0.72
	Paid agricultural employment at the origin	1.82	1.57	1.41
	Paid non-agricultural employment at the origin	2.35	1.51	1.77
	Gardening at the destination	2.19*	0.95	2.21**
	Cash crops at the destination	1.72	1.66	1.53
	Paid agricultural employment at the destination	0.39**	0.61	0.33**
	Paid non-agricultural employment at the destination	0.37	0.19*	0.59
	H2b: Modernization of agriculture[1]			
	Tractor at the origin	0.65	0.18*	1.28
	Plow at the origin	4.60***	2.67**	8.08***
	Irrigation at the origin	5.99**	9.02***	5.35
	Water-conservation technique at the origin	0.96	0.98	0.70
	Tractor at the destination	2.42***	1.56	2.53**
	Plow at the destination	1.00	1.03	1.29
	Irrigation at the destination	0.35**	1.47	0.21***
	Water-conservation technique at the destination	0.66*	0.40**	0.89
	Additional control variables			
	Size of the settlement at the origin (< 10,000 h)			
	>= 10,000 h	0.17*	0.05***	0.66
	Distance to Ouagadougou or Bobo-Dioulasso at the origin (> 200 Kms)			
	<100 Kms	0.04	0.05	0.05
	100-199 Kms	0.14	0.70	0.13
	Presence of road at the origin	4.57***	4.15**	3.65***
	Size of the settlement at the destination (< 10,000 h)			
	>= 10,000 h	6.12*	14.45***	3.00**
	Distance to Ouagadougou or Bobo-Dioulasso at the destination (> 200 Kms)			
	<100 Kms	11.58	18.69	5.25
	100-199 Kms	7.38	1.35	7.03
	Presence of road at the destination	0.55	0.72	0.63

*** : p<0.01; ** : p<0.05 ; * : p<0.10 (two-tailed tests)

[1] Reference category= absence of the activity or the tool in the settlement