Migration, Self-selection and Returns to Education in the WAEMU

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Abstract

Using data from labour force surveys conducted simultaneously in the capital cities of seven WAEMU countries, we estimate a model of residential location choice in which expected earnings play a role. The model is first estimated in a reduced form. Estimates are then used to correct for the endogeneity of locational choice in the earnings equations estimated for each country. We find that migration behaviour has a significant effect in shaping earnings differentials between education levels and between the seven capital cities. Corrected predicted earnings in each country are then

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used as an independent variable in a structural multinomial logit of residential choice. Results show that individuals tend to reside in countries in which their expected earnings are higher than elsewhere.

Keywords: Migration, Self-selection, West Africa

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1   Introduction

Migration from and to African countries is an extensive phenomenon. According to recent estimates by the United Nations Population Division, the total number of international migrants in Africa rose from nine millions in 1960 to 16 millions in 2000. West Africa in particular has a long history of population mobility, both regionally and internationally. Linked with factors as diverse as long-distance trade, plantation agriculture, urbanisation but also armed conflict, land degradation, drought, etc., migration in the region played and still plays a major part in shaping settlement patterns. At a political level, several initiatives have facilitated labor migration, among which the free movement of persons institutionalized by the Economic Community of West African States (ECOWAS).

With this background in mind, the purpose of this paper is to examine the locational choice of a large sample of Africans originating from the West African Economic and Monetary Union (WAEMU). Historically, in the economic literature the concern with migration emerged with the work of Sjaastad (1962). In the development literature, however, Todaro (1969) and Harris & Todaro (1970) are the first to present a model in which the decision to migrate results from the rational comparison of the expected costs and benefits of migration.

In both models, the difference in average expected earnings between countries or regions of destination and countries or regions of origin plays a key role and is predicted to have a positive effect on migration flows. However this kind of model is unable to explain key stylized facts, such as migration flows from and to particular regions or countries. For instance, in Africa, a sizable number of people living in Benin come from Togo and an equally sizable number of people residing in Togo are natives from Benin. Borjas (1987) and, more recently, Dahl (2002) have adopted a rather different approach, based on the seminal paper of Roy (1951). In Roy's framework, workers select themselves in income earning activities on the basis of their comparative advantage. Applied to residential choice, this model explains migration not by average expected earning differentials, but rather by differences in individual expected returns to skills that are either observed or unobserved by the econometrician. As a result migration flows are not necessarily one-sided. Another conclusion of this literature is that migrants' self selection should be taken into account when estimating the returns to human capital in countries where the flow of migrants is significant. Dahl (2002) for instance, in a study of migration between states of the USA, estimates a Roy model and finds that correcting for selection bias substantially changes the estimated returns to education in a sense that supports the role of comparative advantage in mobility decisions. He also finds that migration flows depend positively on the differences in the corrected returns to education.

Estimation of this kind of model is usually very difficult due to the impossibility to gather data on the origin and destination labour markets at the same time. In this paper we use a unique collection of data originating from

the PARSTAT project sponsored by the WAEMU.[1] Representative household quantitative surveys have been conducted simultaneously in the capital cities of seven member States of the WAEMU (Abidjan, Bamako, Cotonou, Dakar, Lome, Ouagadougou and Niamey) in 2001-2002. The surveys provide detailed information for all individuals aged 10 or more within each sample household, relating to education and training, employment, unemployment and earnings. Furthermore, data on country of birth and last country of residence allow to identify international migrants within each national sample.

Our purpose in the paper is threefold. First, we fill a gap in the knowledge of cross-border migrations within Africa, using our sample data to compare the characteristics of migrants with those of non migrants in their countries of origin and destination. Although the overall picture is drawn using data on capital cities only, some interesting features emerge. Second, we want to evaluate the extent of the bias in the estimated returns to education, when international migration is not accounted for. Third, we want to determine whether or not earnings differentials matter in the choice of the country of residence. In the model that follows we assume that individuals are born randomly in one of the seven countries under review, but then rationally choose the country in which they reside by comparing the utilities associated with each choice. Estimation of this model provides unbiased estimates of the returns to education, together with the effect of expected earnings differentials on the probability of choosing one particular country. Given the data at hand, the universe of destination countries is restricted to those countries that are quite close to each other in

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terms of geographical, legal, cultural and economic distance. They share the same language, have a common currency and, most importantly, they all belong to the WAEMU region within which people are free to move and settle. While this restriction is regrettable and constitutes a clear limitation of our study, it does nevertheless make sense to analyse migrants' choice of destination in the West African context where there are no legal barriers to migrate and where most international migration takes place intra-regionally. We find that migration behaviour plays an important role in determining earnings differentials between countries and between individuals with different education levels. Moreover, our results suggest that earnings differentials matter in locational choice.

2 Data and descriptive statistics

2.1 Overview of migration patterns within the West African region.

Movements of labour in Sub-Saharan Africa are not a new phenomenon. Over the generations people have migrated in response to demographic, economic, political and other related factors, such as population pressure, environmental disasters, poverty and conflicts. In pre-colonial West Africa, migrations were generally circular, seasonal and of short duration, and occurred largely from unsecure or drought-prone regions to more secure and fertile regions (Adepoju 2005). Colonialism significantly altered the motivation and migration patterns in this region by introducing far reaching structural changes. In particular, the development of transportation systems, the monetization of the economy and

the deliberate development of mining enclaves and plantation agriculture together with a series of recruitment policies (compulsory recruitment, contract and forced labour legislation and agreements) stimulated regional labour migration from Mali, Togo and Upper Volta to Gold Coast and Côte d'Ivoire (Adepoju 2005, Adebusoye 2006). These socio-economic and historical factors have shaped contemporary patterns of migration between African countries. However, with the end of colonialism and largely in response to growing disparities in living standards, inter-continental migration in the direction of Northern developed countries has been a growing phenomenon for the last fourty years.

Despite their importance, yet little is known about these migrations. The information provided by census data, immigration and emigration statistics and a small number of *ad hoc* surveys on the number, identity and motivations of both inter- and intra-continental African migrants is indeed far from being complete and reliable. In particular, estimates on the number of African international migrants widely differ between sources: they range from about 16 millions according to the International Organisation for Migration (IOM, 2003) to 50 millions according to the African Union (AU, 2005). Evidence is even more scarce concerning trans-border migrations within the West African sub-region. How many trans-border migrants are there in each West-African country? Who are these migrants? What are their main motivations? Here are some of the questions we want to address in this paper.

2.2   Data sources

Our data come from representative household quantitative surveys (the *1-2-3 Surveys* on Employment, Informal Sector, Consumption and Poverty) conducted

simultaneously in the capital cities of Benin (Cotonou), Burkina Faso (Ouagadougou), Cote d'Ivoire (Abidjan), Mali (Bamako), Niger (Niamey), Senegal (Dakar) and Togo (Lome) in 2001-2002 (see Appendix for details on the sampling frame). These countries are all members of the Economic Community of West African States (ECOWAS).[2] The creation of ECOWAS, in 1975, responded to the recognition by West African leaders that intra-regional integration could be an important step towards the region's collective integration into the global economy. The key objective of the Community was thus to remove obstacles to the free movement of goods, capital and people in the sub-region. In line with this objective, the Protocol on Free Movement of Persons and the Right of Residence and Establishment was signed in May 1979. A transition period followed, during which the rights of entry (in 1980) and residence (in 1986) were established. More recently, in 2000, members of the ECOWAS agreed to introduce a new passport for citizens of the sub-region that will progressively replace national passports. Even though much remains to be done in order to achieve a complete liberalization of labour migration within the community - some countries are still restricting foreigners, including community nationals, from participating in certain kinds of economic activities - all these measures taken to create a borderless West Africa provide a good opportunity to study the residential choice of people within the community. Moreover, amongst the ECOWAS members, the countries of our sample are all French-speaking countries and are all members of another community, namely the West African Eco-

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[2]ECOWAS groups 15 countries: 5 English speaking countries (Gambia, Ghana, Liberia, Nigeria, Sierra Leone), 8 French speaking countries (Benin, Burkina Faso, Guinea, Ivory Coast, Mali, Niger, Senegal, Togo) and 2 countries sharing Portuguese as their official language (Guinea Bissau and Cape Verde).

nomic and Monetary Union (WAEMU).[3] As such they share the CFA franc as a common currency. These common features undoubtedly facilitate labour migration.

Implemented by National Statistical Institutes in conjunction with AFRISTAT and the IRD Research Unit DIAL, the *1-2-3* Surveys provide detailed information for all individuals aged 10 or more within each sample household relating to education and training, employment, unemployment and earnings. Furthermore, data on country of birth and last country of residence allow us to identify migrants within each national sample. More details on the survey can be found in Amegashie et al. (2005).

2.3 Descriptive statistics

2.3.1 Numbers of migrants

Table 1 reports the composition of each national sample. For ease of computation, we consider as migrants all individuals who meet the following three criteria: (i) they are not citizens of the country they reside in; (ii) they were not born in the capital city of the country they reside in; and (iii) they have not been residing continuously in the capital city since they were born. Individuals who are not migrants are considered as natives. In the empirical analysis that follows, we restrict the sample to all active individuals aged be-

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[3]Created in 1994, the West African Economic and Monetary Union (WAEMU) is composed of eight member States: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Some of the principal objectives of WAEMU are to: (i) strengthen competitiveness of the economic and financial activities of the member States within the context of a free and competitive common market and a rationalised and harmonised legal environment; (ii) achieve convergence of the performance and economic policies of the member countries; and (iii) create a common market among the member countries based on free movement of persons, goods, services, and capital and the right of establishment of persons engaged in an independent or salaried employment, and on a common external tariff and trade policy.

tween 15 and 65, originating from one of the seven countries covered by the *1-2-3* survey and residing in the capital city of one of these countries either as natives or as immigrants. To avoid confusion, all individuals included in the sample appear in bold in Table 1. As suggested by the figures, there is a wide variety of migration configurations within the WAEMU. Figures first suggest that despite the severe sociopolitical crisis that started in 1999 with a military coup d'Etat which has resulted in reverse flows of migrants, Cote d'Ivoire is still, by far, the most important immigration country in the WAEMU region.[4] Extrapolation from the Ivorian sample reveals that 15.9 per cent of Abidjan's inhabitants aged 16 or more are immigrants among which 74 per cent are citizens of a WAEMU country (see Table 2 for extrapolated figures). Even though migration flows from Burkina Faso and Mali have been fluctuating since the beginning of the crisis, these two neighboring countries remain the main providers of migrants to Cote d'Ivoire. By contrast, immigrants from bordering WAEMU countries only account for a marginal share of the population in Dakar, the capital city of Senegal. Extrapolated figures suggest indeed that less than 2 per cent of Dakar's inhabitants are non-Senegalese, among which a large share comes either from Guinea, Guinea Bissau, Gambia, Mauritania or Mali. Last, a quick comparison of row and column totals by country suggests that Malian and Burkinabe expatriates residing in the capital city of a WAEMU country largely outnumber the expatriates from WAEMU countries residing in Bamako or Ouagadougou, suggesting that Mali and Burkina Faso have been and still are major labour-exporting countries. Benin, Niger and Togo, by contrast, combine both emigration and immigration. The question of the representativeness of our

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[4] The civil war in Côte d'Ivoire started in september 2002, a few months after the completion of the 1-2-3 survey.

samples needs to be raised, though. It is indeed likely that our migrants' samples are not representative of the whole population of migrants since we miss all those individuals who moved out of their country to settle in a rural area of another WAEMU country. Those migrants might strongly differ from the ones recorded in our samples, especially with regards to their distribution by country of origin. The share of Togolese among immigrants in Benin, for example, may not be as high as the share of Togolese among immigrants in Cotonou. Or the share of immigrants in Burkina Faso may not be as small as the share of immigrants in Ouagadougou. To complete the picture and compare our figures with those computed at the country level, Table 3 reports statistics on immigrants by country of origin in each one of the seven WAEMU countries under concern, using census data. Overall, the same general migration patterns emerge: national data confirm the position of Cote d'Ivoire as the main labor-importing country of the region, with most migrants coming from Mali or Burkina Faso; they confirm the marginal participation of Senegal in intra-regional migration flows; and they finally confirm that Benin, Niger and Togo both import and export labour. The picture for Burkina Faso, however, strongly differs from the one we drew using data on Ouagadougou only. Rural Burkina Faso is indeed found to host a fairly high number of Malian migrants who are not accounted for in our urban sample. Our inference for Burkina Faso using data on Ouagadougou only should thus certainly be considered with caution. Another issue relating to the representativeness of our samples relates to the fact that immigrants are a relatively small share of the population and may cluster in some given areas. Given the sampling frame of the PARSTAT surveys, it is possible that such areas were missed when the census sectors were selected in the first

stage. Although this possibility cannot be totally ruled out in some cities, we believe in the representativeness of our samples in the cases of Lome, Abidjan and Bamako. In the case of Lome indeed, since 125 census sectors were selected out of 129, the probability that we missed clusters of migrants is quite low. In the two other cases, our estimates on immigration rate at the level of the city and on the composition of migrants' stocks by country of origin are quite similar to the ones obtained using census data. In addition, we used our representative samples of census sectors in each capital city to test the null hypothesis of random allocation of migrants across neighbourhoods and could reject it in none of our samples.

2.3.2 Migrants' main characteristics

Table 4 provides some descriptive statistics on the main characteristics of natives and immigrants by country of residence. Figures first suggest that compared to natives, females are under-represented in the immigrant population of Ouagadougou, Abidjan and Lome while they are slightly over-represented in that of Cotonou and Niamey. Traditional male-dominated short-to-long distance migratory streams in West Africa are thus increasingly feminised, suggesting a turn-around in traditional sex roles. Second, no clear pattern emerges with regard to age. Immigrants are significantly older on average than natives in Abidjan, Niamey and Lome but are roughly of the same age in all the other capital cities. Third, immigrants appear to be less educated on average than natives in four capital cities out of seven (Cotonou, Abidjan, Niamey and Lome). As a result, the percentage of non graduate individuals among immigrants in these four cities is much higher than among natives. The education gap is par-

ticularly pronounced in Abidjan where immigrants have two years of schooling on average against 6.6 for natives. In reading Table 4, however, one should not forget that statistics for natives are computed using data collected in capital cities only. Some of them are thus likely to be bad proxies for the situation prevailing at the national level (mean education levels, for example, are generally much higher in urban areas than in rural ones). It should consequently come as no surprise that immigrants in Cotonou, Abidjan, Niamey and Lome (a majority of which might come from rural areas) are on average less educated than Beninois in Cotonou, Ivorians in Abidjan, Nigeriens in Niamey and Togolese in Lome. The cases of Bamako, Ouagadougou and Dakar, where immigrants appear to be more educated on average than natives, suggest that those capital cities mainly attract educated people (this could be the case for Dakar) and/or people coming from urban areas. Due to small sample size, however, the figure for Dakar should be taken with caution.[5]

As a complement to Table 4, Table 5 provides some descriptive statistics on the main characteristics of non-migrant natives and emigrants, or "stayers" and "movers", by WAEMU country. In most countries, males are over-represented in the emigrant population except in Togo and, to a lesser extent, in Benin. Intra-regional migratory flows from these two countries are mostly motivated by commercial purposes and have traditionally been female-dominated. In terms of education, emigrants appear much less educated than non-migrant natives in all countries, suggesting that migration flows within the WAEMU region mainly concern low-qualified workers.

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[5]People may have migrated to Dakar to get educated, so that the decision to reside in Dakar may be an endogenous one with respect to education. Our sample of immigrants in Senegal, however, is only composed of individuals who arrived in Dakar after the age of 25. It is thus likely that the choice of residing in Dakar was made after final graduation.

To further learn on migration patterns within the WAEMU region, Tables 6a, 6b and 6c provide more disaggregated figures on the main characteristics of migrants (in terms of education and gender) by origin and destination countries. Interesting features emerge. First, whatever their country of origin, immigrants in Abidjan and, to a lesser extent, in Niamey are much less educated on average than their nonmigrant compatriots or than their compatriots who migrated to some other West African countries. As an illustration, Nigeriens in Abidjan have only one year of schooling on average while Nigeriens in Niamey, Cotonou and Lome have respectively 5.0, 2.6 and 3.1 years of schooling; Burkinabe in Abidjan have 1.5 year of education on average while Burkinabe in Bamako, Niamey and Lome have respectively 4.6, 2.6 and 3.8 years of schooling; etc. Abidjan is thus found to attract the least educated among the migrants (Table 6a). The education gap between movers and stayers could be due to age cohort effects, however. To test for the existence of such effects, we run separate regressions (one per country) in which the level of education is explained by a set of variables including age, sex, religion, father's education and migration status. Migration status is either non-significant or with a negative sign in all regressions, bringing support to the idea that migrants are less educated on average than non-movers in both host and origin countries, even after controlling for their age. Another interesting feature is related to the sex composition of immigrant populations (Table 6b). Here again, Abidjan stands apart: whatever their country of origin, immigrants in the capital city of Côte d'Ivoire are mostly males. By contrast, the proportion of males is much lower on average among their compatriots who migrated to another capital city. The cases of Togo and Benin are very illustrative: Togolese and Beninois emigration to neighboring

WAEMU countries is female-dominated except for Abidjan. To sum up, Abidjan is found to attract low-educated males from everywhere in the region; both Niamey and Cotonou attract low-educated females from Togo; Niamey also attracts low-educated females from Cotonou; in the mean time, Nigeriens males are sent to Lome and Cotonou.

2.3.3 Migrants' employment status

To complete this overview, Table 7 provides descriptive statistics on the employment situation of natives and immigrants by country of residence. On average, labour force participation is higher for immigrants than for natives. The difference is particularly strong in the cases of Abidjan and Niamey, suggesting that migration streams to these two capital cities are mainly motivated by labour market considerations. Given the individual characteristics of immigrants, particularly with respect to their level of education, one would expect their employment situation to be less favourable than that of natives in Cotonou, Abidjan, Niamey and Lome and more favourable in Dakar. In the context of labour markets in developing economies, a favourable situation is that of formal wage workers in the public or private sector, in contrast to the situation of informal workers. Formal wage workers usually enjoy higher wages, more job security and more benefits than informal workers. Figures indicate that this is indeed the case. The percentage of immigrants working in the informal sector is much higher than that of natives in Cotonou, Abidjan, Bamako, Niamey and Lome while it is lower in Dakar and in Ouagadougou. Average hourly earnings roughly follow the same pattern. Compared to natives, immigrants are indeed found to enjoy much lower hourly wages on average in Cotonou (-29%), Abidjan

(-41%) and Niamey (-30%) while they enjoy much higher hourly wages in Dakar (+91%), Lome (+33%) and Bamako (+67%). Figures for Dakar and Bamako should however be considered with great care given small sample size. Lome stands as an exception since its immigrants are less educated on average, are more concentrated in the informal sector, but enjoy significantly higher hourly wages than natives.

3   Model specification and estimation strategy

We study the locational choice of individuals originating from one of the seven countries of the PARSTAT project. Given the data at hand, we do not aim at estimating a complete model of locational choice covering the whole universe of destination countries. We have a large sample of individuals who reside in the capital city of a given WAEMU country and our objective is to investigate whether they are rational to do so or not, at least from the point of view of their monetary utility, *i.e.* whether residing in the capital city of another WAEMU country would allow them to get higher earnings given their observed and unobserved characteristics or not. Each individual has the choice to settle in any of these seven countries. We assume that individuals behave as if they maximize a stochastic utility function, where utility is a function of the distribution of earnings in the chosen location. The question is whether differences in individual specific mean earnings determine locational choice. The difficulty is that, since we observe earnings at only one location for each individual, potential earnings at other locations must be imputed and, in doing so, it is necessary to hold account of the fact that location choice is not random, but partly commanded

by earnings differences. Thus our estimation strategy proceeds in three steps. In the first step a multinomial logit model of locational choice is estimated using a reduced form specification. The results from this estimation are then used to compute appropriate correction terms that are added as independent variables in Mincer-type earnings equations. Results from this second step are then used to identify the effect of expected earnings differentials in locational choice.

We assume that individual i, born in country j, and living in country k has a utility $u_i(j, k)$ given by :

$$u_i(j, k) = \alpha. \ln y_{ik} + z_i' \gamma_k + v_i(j, k) \tag{1}$$

with $\ln y_{ik}$ the logarithm of the individual's hourly earnings in country k and z_i a vector of individual characteristics. We assume that $v_i(j, k)$ is independent of $v_i(j, l)$ for all k and l. An increase in labour market earnings provides identical gains in utility, independently of the country of residence. This might be too strong an assumption if large differences exist between countries in the set of available goods and their price. For instance health services could be free of charge in one country and very costly in another. This would impact on the living standards of people with identical incomes but not living in the same country. In the present case, the data we use come from very similar countries: all of them are former French colonies and they share a common currency. Moreover, all surveyed individuals live in capital cities, between which differences in markets are likely to be smaller than between urban and rural areas. In addition to earnings, we assume that utilities are impacted by individual characteristics, z_i, with the size and sign of the impact depending upon the country of residence. For instance, countries in the WAEMU largely differ by

their population's religious composition: more than 90% of the population living in Dakar (Senegal), Bamako (Mali) and Niamey (Niger) is muslim, against about 10% in Lome (Togo) or Cotonou (Benin). *Ceteris paribus*, individuals of a given confession might prefer to live in countries where this confession is well represented. As a result, being a Muslim should have a positive impact on utility for people living in Dakar, Bamako and Niamey, but a zero or even a negative impact for people living in Lome or Cotonou.

Individual i decides to live in country k if this choice provides more utility than living in any other country net of moving costs, that is:

$$u_i(j,k) - c(j,k) \geq u_i(j,l) - c(j,l) \qquad \text{for any } l. \tag{2}$$

where $c(j,k)$ (respectively $c(j,l)$) is the cost of settling in country k (respectively l) when born in country j. These costs cannot be observed. In the econometric estimation of the model we shall use nationality dummies in order to account for them, assuming that individuals originating from the same country face the same level of costs. Individual variations in the z variables will also help in accounting for psychic and other non monetary costs.

We are particularly interested in estimating α in equation (1). Since $\ln y_{ik}$ is only observed for individuals living in country k, estimation has to proceed in several steps. First, we assume that each individual living in country k faces a Mincer-type earnings equation:

$$\ln y_{ik} = x'_{ik}.\beta_k + u_{ik} \tag{3}$$

where x_{ik} is a vector of individual characteristics such as sex, education or

labour market potential experience. Second, we substitute $\ln y_{ik}$ in equation (1) and get utility in a reduced form:

$$u_i(j,k) = \alpha.(x'_{ik}.\beta_k) + z'_i.\gamma_k + \varepsilon_i(j,k)$$

where $\varepsilon_i(j,k) = \alpha.u_{ik} + v_i(j,k)$.

Under the assumption that $\varepsilon_i(j,k)$ has a generalized extreme value distribution, it can be shown that:

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\begin{aligned}
P(i \text{ born in country } j \text{ lives in } k) &= P(M_i(j) = k) \\
&= \frac{\exp(\alpha.(x'_{ik}.\beta_k) + z'_i.\gamma_k - c(j,k))}{\sum_{l=1}^{P} \exp(\alpha.(x'_{il}.\beta_l) + z'_i.\gamma_l - c(j,l))} \\
&= \frac{\exp(x'_{ik}.\beta_k^\alpha + z'_i.\gamma_k - c(j,k))}{\sum_{l=1}^{P} \exp(x'_{il}.\beta_l^\alpha + z'_i.\gamma_l - c(j,l))} \quad (4)
\end{aligned}
$$

with P the total number of locations and $\beta_k^\alpha = \alpha.\beta_k$. This is known as the multinomial logit model and is well documented in standard reference textbooks.

Results from this reduced form estimation can then be used to correct for endogenous selection in the earnings equations. The multinomial logit suffers from the Independance of Irrelevant Alternatives assumption, which in this case is unlikely to hold. Indeed, since the error term, $\varepsilon_i(j,k)$, is a composite of equations (1) and (3) perturbations, one can expect $cov(\varepsilon_i(j,k), \varepsilon_i(j,l)) \neq 0$, if unobserved heterogeneity subsists in u_{ik}. However, based on Monte-Carlo simulations, Bourguignon et al (2004) conclude that *"selection bias correction based on the multinomial logit model seems a reasonable alternative to multinomial models when the focus is on estimating an outcome over selected populations*

rather than on estimating the selection process itself. This seems even true when the IIA hypothesis is severely at odds." We are then confident that our choice of the multinomial logit should not bias our results at this stage.

As shown by Lee (1983), to correct for the endogenous selection in the earnings equations, it is possible to adapt the two steps method suggested by Heckman (1979) to the case of polychotomous choice models. His intuition is that the dimension of the problem can be reduced by substituting the P selection equations in (2) by the single condition that:

$$\max_l(u_i(j, l) - u_i(j, k)) \leq 0$$

in which costs are omitted for ease of exposition.

Then, transforming to normal the cumulative distribution function of the maximum order statistic achieves the transformation of the P-dimensional joint distribution of the earnings and selection equations error terms to one of a bivariate normal distribution, in which the Heckman procedure can be applied. However, as shown by Schmertmann (1994) and more recently by Dahl (2002) and Bourguignon, Fournier & Gurgand (2004), Lee's method implies very strong restrictions on the correlation structure of the earnings and selection equations disturbances and is only adapted to very small samples. Dahl (2002) suggests a non parametric method that is less demanding and better adapted when a large number of observations is available. The idea is to use the results of the polychotomous choice model to compute, for each observation, a set of choice probabilities, then to correct the earnings equation of endogenous selection by adding a polynomial of these probabilities in the list of explanatory variables.

In this paper we thus use Dahl's correction method and Bourguignon et al. (2004)'s Stata program to estimate our model and to get unbiased estimates of the Mincer equations coefficients, β_k.

In order to recover the value of α in the structural model a final step is needed. Following Gourieroux and Monfort (1995), one possibility could be to use a Minimum Distance Estimator, based on the set of constraints that have to be satisfied by coefficients of equations (1), (3) and (4) under the assumptions of the structural model, that is:

$$\widehat{\beta_k^\alpha} - \alpha.(\widehat{\beta}_k - \widehat{\beta}_0) = 0 \text{ for } k = 1 \text{ to } 6. \tag{5}$$

where index $'0'$ refers to the reference country in the reduced form multinomial logit equation.[6] Let $\theta = (\widehat{\beta_1^\alpha}', .., \widehat{\beta_6^\alpha}', \widehat{\beta}_0', .., \widehat{\beta}_6')'$ be the vector of estimated coefficients in the first and second steps of the estimation. The constraints system of equation can be written:

$$g(\widehat{\theta}, \alpha) = 0$$

and the Minimum Distance Estimator of α, $\widehat{\alpha}$, verifies:

$$\widehat{\alpha} = \arg\min(g(\widehat{\theta}, \widehat{\alpha})'.S_n.g(\widehat{\theta}, \widehat{\alpha}))$$

with S_n an appropriately chosen weighting matrix. Unfortunately, this estimator of α is likely to be biased if, because of the violation of the IIA assumption in the reduced form model, the $\widehat{\beta_k^\alpha}$ are themselves biased.

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[6] In the multinomial logit model, only the differences $\beta_k^\alpha - \beta_0^\alpha$, where 0 is the index of a reference country, can be identified.

The second possibility is to compute unconditional average earnings predictions, for each individual in each possible location, using unbiased estimates of β_k and proceed to the estimation of the following structural conditional logit model:

$$P(i \text{ lives in } k) = P(M_i(j) = k) = \frac{\exp(\alpha.(x'_{ik}.\widehat{\beta}_k) + z'_i.\gamma_k)}{\sum_{l=1}^{P} \exp(\alpha.(x'_{il}.\widehat{\beta}_l) + z'_i.\gamma_l)} \tag{6}$$

This will yield unbiased estimates of α under the assumptions of the structural model.

4   Model identification and choice of variables

In order to be identified, our model relies on various assumptions that need to be properly tested. In particular, in the second step of our procedure in which we correct for individuals' self-selection, it is important to have one or more variables that explain locational choice (i.e. that enter the first stage equation) but do not influence earnings. In what follows, we use dummies indicating whether the individual's father did not go to school or was absent when she was 15, together with dummies for the individual's religion and nationality as identifying variables.[7] Religion is indeed likely to have an influence on destination choice given that large differences exist between countries in their population's dominant religions. Nationality dummies are also included to account for macro-level variables, such as average GDP per capita, mortality rates or the shares of immigrants from ECOWAS countries in the country's population. These vari-

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[7] For some observations the father's education is unobserved. In order to keep our sample as large as possible, we chose to put 0 for the father's education when it was missing and to add a dummy that equals 1 in that case and 0 otherwise.

ables also capture migration costs between the origin and destination countries. There are of course reasons why any one of these exclusion restrictions could be violated. For example, if there is discrimination against people of a particular nationality or religion in a particular destination country, then these variables would influence earnings. They could also influence earnings through affecting schooling differences, if people from different countries with the same education level receive different quality of schooling. However, we believe discrimination on the basis of nationality or religion to be second-order concerns within these similar countries, and there is evidence suggesting that the quality of schooling does not differ dramatically across these countries. Indeed, according to Unesco *Education for All* 2005 Monitoring Report which provides various indicators measuring the quality of education, none of the seven countries under concern stands out of the crowd. For instance, Benin ranks first when the quality of education is measured by the probability of being literate after 6 years of primary school, but ranks fourth and seventh when quality is measured by test scores and the average teacher wage respectively. It could also be argued that father's education and father's presence in household at age 15 are correlated with household wealth, which affects occupational choice and earnings. However, we run overidentification tests that do not reject the null hypothesis of zero correlation between our instruments and the principal equation error terms in five out of seven countries.[8]

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[8] Identification then rests upon non linearity as the list of covariates in the selection equation is the same as in the earnings equation. Under the null hypothesis, however, the coefficients of our instrumental variables are zero in the earnings equation, thus providing the necessary exclusion restrictions to identify the model. Moreover, it is not absolutely necessary that the list of covariates in the selection equation includes variables that do not appear in the earnings equation (Wooldridge, 2000) . The difficulty comes from the fact that the control functions in the selectivity corrected earnings function could be approximated by linear functions of the explanatory variables, thus creating potential multicollinearity. In our case, neither the estimated coefficients, nor their standard errors, were significantly modified when we added

In the third stage of our procedure, identification of the log-earnings coefficient, α, in the structural model of residential choice depends upon the exclusion from equation (1) of at least one variable that enters in the log-earnings equation (3). Here we assume that sex, education and employment sector explain log-hourly earnings but not residential choice, once earnings are accounted for. There are some good reasons for which education could determine residential choice, apart from its impact on potential earnings. One possibility is that well educated individuals might prefer countries where the average level of education is high, not only because their own wages are going to be higher, but also because they will benefit from positive externalities related to this high average level of education (such as a higher supply of cultural goods for instance). In our case, however, movers appear much less educated on average than stayers both in origin and destination countries, so we believe this incentive to be low. It could also be argued that people moving abroad experience a loss in utility due to the remoteness of their home country, extended family and friends. This could induce a direct effect of the sex variable on locational choice, besides its indirect effect through earnings, if males (resp. females) experience a greater loss than females (resp. males). However, it is not clear whether the difference between sexes in this utility loss should be large, since both men and women rely on family and friends networks. They may, as such, have quite similar preferences to stay in their home country. Last, excluding the employment sector from the locational choice decision does not seem too heroic an assumption given the strong similarities in the structure of urban labour markets (and in the share of public vs. private and formal vs. informal jobs in particular) that

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the father's characteristics in the earnings equation.

exist between the seven countries.

In the earnings equation our dependent variable is the logarithm of total hourly earnings in CFA francs. All earnings are expressed in purchasing power parity (PPP). The conversion to PPP CFA francs is necessary in the third step of our estimation, where the individual's expected earnings in the seven countries are allowed to influence the probability of choice. The PPP conversion factors we use have been computed in 1998 by ASECNA and have been actualized through 2001 using national inflation rates.[9] Independent variables in the earnings equations are sex, education (as measured by the last diploma obtained), potential labour market experience and its square, the abilities to speak french and another foreign language, two dummies for the public or private formal sectors and a series of dummies for the father's activity when the individual was 15. This last set of variables is included both as a determinant of migration behaviour and as a proxy for the individual's sector choice, to account for the earnings differentials between the different sectors of the economy. The reduced form multinomial logit model includes these variables, together with dummies for the individual's religion and nationality.

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[9] ASECNA is the Agence pour la Sécurité de la Navigation Aérienne en Afrique et à Madagascar. This agency computed its own PPP conversion factors, based on prices observed in the African capital cities, in order to give the same wage to its agents in terms of purchasing power. Another possibility is to use the conversion factors published by the World Bank in its World Development Indicators (World Bank 2003). However, we think ASECNA PPP is preferable for our purpose, since it has been specifically designed to make comparisons between capital cities.

5 Estimation Results

5.1 Reduced form multinomial logit of residential choice

Estimation results are presented in Tables 8, 9 and 10. Table 8 shows the results of the reduced form multinomial logit estimation. These are uneasy to comment because only the differences $\beta_k^\alpha - \beta_0^\alpha$ can be identified, where 0 is the index of a reference country (Senegal in our case). Thus, for instance, the positive coefficient of the sex variable in the equation for Benin tells that being a male increases *relatively* more the utility resulting from choosing Benin than the utility resulting from choosing Senegal. However it does not mean that being a male increases the utility associated with Benin in absolute terms, as it could happen that $0 > \beta_k^\alpha > \beta_0^\alpha$. The results suggest that, among the seven countries under review, holding a post-graduate degree increases more (or decreases less) the utility to reside in Senegal than that of residing in any other country. By contrast, holding a baccalaureate degree increase the utility of residing in Burkina Faso, Côte d'Ivoire, Niger or Togo much more than that of residing in Senegal. The same holds true for people of muslim or catholic confession. Unsurprisingly, we also find that being of Senegalese nationality increases much more the utility to reside in Senegal than that of residing in any other country, with the exception of Mali, but the coefficient is unsignificant (results not shown).

5.2 Earnings equations

Following Dahl (2002), the estimated coefficients of the reduced form multinomial logit have been used to compute, for each observation of the sample, a

polynomial of choice probabilities that has been added to the set of explanatory variables in the earnings equation. Several specifications have been tried. Theoretically, all but one destination probabilities could enter the correction functions. However, in our sample, this led to multicollinearity problems in the earnings equations so we had finally to retain a more restricted set of choice probabilities, that includes: the first best choice probability, that is the probability to reside in the actual residence country ; the retention probability, that is the probability to reside in the country of citizenship and finally the highest predicted probability, excluding the retention probability.[10] We complete this set of selection correction terms by adding the interactions between these probabilities as explanatory variables. The resulting equations have been estimated by OLS. Since our estimation strategy is a multi-step procedure, the entire process has been bootstrapped with 50 replications and bootstrapped standard errors have been used for hypothesis testing. Results are presented in Table 9. As the coefficients of the polynomials of the selection probabilities have no interpretation and because of space limitations, we limit the presentation to the coefficients of the variables that have a direct interpretation. The first column shows the estimated coefficients when no correction for endogenous selection is applied while the second column presents the corrected coefficients. The results of a series of Wald tests are also shown at the bottom of Table 9. Several test statistics were computed. First, we test whether the selection correction terms enter the earnings equation significantly. Second, we test the hypothesis that our excluded variables, that is the father, religion and nationality dummies,

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[10]This follows a strategy suggested by Dahl (2002). In his application to USA data, after testing several specifications, he ended up in using an even more restricted set of probabilities, keeping just the first best choice and the retention probabilities in the correction function.

have no significant contribution to the explanation of the dependent variable, namely log-earnings.[11]

Looking first at the overidentification tests, the results allow us to conclude to the correct identification of our model: albeit in the cases of Mali and Togo and for the father dummies only, the Wald tests statistics are found to be insignificant, indicating that the vector of variables used to instrument residential choice does not contribute to the determination of earnings, once the correction terms are included. For Mali and Togo, we re-run the earnings regressions including the father dummies as explanatory variables and checked that this did not change significantly the results.

As for the correction functions, we find that for four countries, namely Benin, Cote d'Ivoire, Mali and Togo, we can reject the hypothesis that the coefficients of the polynomials included to correct for endogenous selection are all zero, suggesting that in these countries, holding account of migrants self selection impacts the estimation of earnings equations in the capital. In none of the cases, however, does adjusting for self-selection change the returns to education enough that the adjusted coefficients lie outside the confidence intervals for the unadjusted ones. This result suggests either that, given the relatively small number of migrants in our samples, selection does not strongly bias the estimated returns to education, or that our control functions do not do much to correct for the type of selectivity that matters.

In Benin, Côte d'Ivoire and Niger, corrected coefficients are found lower than uncorrected ones, suggesting that migrants to these countries share unobserved characteristics that make their earnings higher than the host country average.

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[11] All tests are based on bootstrapped standard errors.

The opposite is found in Mali and Togo. Notice that this has no implication in terms of migrants positive or negative selection. Indeed, even though migrants to Mali appear to have lower than average earnings in their host country, it could still be the case that their earnings in the host country are higher than what it would be in their origin country. In order to check whether or not earnings differentials matter in locational choice we need to estimate the model in its structural form.

Comparing returns to education shows large differences between countries. In Bamako, and to a lesser extent in Dakar, returns to education seem much lower than in other capitals. The progression in returns between grades does not appear very steep either (see figure 1). In Bamako, having completed primary school yields an estimated increase in hourly earnings of only 23% compared to uneducated individuals, a much lower estimate than what is found in Abidjan, where the increase is estimated around 55%. In all countries, the highest returns are found for the bachelor degree. The lowest value is found in Bamako (+114% when compared to uneducated individuals) and the highest in Lome (+227%).

5.3   Structural model of residential choice

The last question we examine in this paper is whether earnings differentials matter in locational choice. Results of the conditional logit estimation (equation (6)) appear in Table 10a. We present the results obtained when no correction for endogenous selection is applied, together with the corrected results. Obviously, correcting for endogenous selection significantly changes the coefficient estimates of log earnings in the structural model: with no correction, the coefficient is found small and weakly significant. Its size more than doubles and becomes very

significant when we correct for endogenous selection, bringing support to the idea that individuals tend to locate in countries where their expected earnings are higher.

A second assessment of this is given by the results of simulations that we run to compare wages between origin and destination countries. Here is how we proceed:

- Step 1: compute for each individual, the predicted value of its average hourly income in each country: $x'_{ik}.\widehat{\beta}_k$.

- Step 2: for each individual, draw a value in the standard normal distribution: $\widehat{u}_i^s$

- Step 3: for each individual, i, and for each country, k, compute the predited value of individual's hourly income: $x'_{ik}.\widehat{\beta}_k + \widehat{\sigma}_k.\widehat{u}_i^s$, where $\widehat{\sigma}_k$ is the estimated value of u_{ik} standard deviation in equation (3).

- Repeat steps 2 and 3 one hundred times.

- For "movers", compute the number of times the individual is found to live in a country, r, where its predicted hourly income is higher than what it is in its country of citizenship, c:

$$\sum_{s=1}^{100} 1_{\left\{ x'_{ir}.\widehat{\beta}_r + \widehat{\sigma}_r.\widehat{u}_i^s > x'_{ic}.\widehat{\beta}_c + \widehat{\sigma}_c.\widehat{u}_i^s \right\}} = m_{ic}$$

- For "stayers", compute the average value of predicted hourly incomes in the countries where the individual did not choose to reside, then compute the number of times the predicted value of hourly income in the country of citizenship if found higher than this average:

$$\sum_{s=1}^{100} 1_{\left\{ x'_{ic}.\widehat{\beta}_c + \widehat{\sigma}_c.\widehat{u}_i^s > \frac{1}{6} \sum_r x'_{ir}.\widehat{\beta}_r + \widehat{\sigma}_r.\widehat{u}_i^s \right\}} = s_{ic}$$

Table 10b shows the results of this exercise. For movers (resp. stayers) of each country we report the proportion of individuals for which m_{ic} (resp. s_{ic}) is larger than 50. As we can see, for Benin, Burkina Faso and Mali our model does a good job in predicting that movers live in a country where their hourly income is higher than in their country of citizenship. Stayers are also well predicted in Ivory Coast, Mali, Niger and Senegal. However it fails to predict the destination of movers from Senegal and Togo and of stayers in Benin. That the model fails to predict the behavior of workers in some countries should not be surprising, since potential income differentials are certainly not the only motive for migration. In a sense the model's relative ability to predict workers' choice based on potential income differentials is a surprisingly good result. In Mali in particular, incomes differentials seem to play an important role.

In the same vein, we computed, for movers, the difference between the predicted value of hourly earnings in the origin country and that of hourly earnings in the destination country and, for stayers, the difference between the predicted value of hourly earnings in the origin country and an average of the predicted value of hourly earnings that could be obtained in the six potential destination countries. Then, separately for movers and stayers, we computed the average value of these differences. The difference is close to zero for stayers (-0.36), suggesting that for these people there is no real gain of moving abroad whereas, for movers, the gain appears substantial and significant (-3.99), meaning much higher hourly earnings abroad than in the origin country.

5.4 Robustness checks.

Several robustness checks have been done. First, in the second stage of our estimation procedure we run a Heckman selection model using data on participants and non-participants to the labour market, instead of running an OLS regression on participants only. Indeed, in the foregoing estimations, due to the difficulty of controlling both for the endogenous selection of locational choice and for labour force participation, our sample was restricted to labour market participants. This limitation is naturally a potential source of bias in our estimates. The identifying variable in the Heckman selection model is marital status (i.e. whether the individual is married or not), which is assumed to influence labor market participation but not earnings. Results obtained in the third stage were not affected by this change, suggesting negligible biases.

Second, we checked whether self-selected *internal* migration affected the observed returns to education but found no evidence of a selection bias.

Last, since our results might depend upon the set of conversion factors used to convert current CFA francs to PPP, we re-run our model using the World Bank set of conversion factors (World Bank 2003). Once again, this modification did not change our results significantly.

6 Conclusion

In this paper we use a unique set of identical labour force surveys that allow to observe at the same time migrants in seven WAEMU countries and their country of origin's labour market. We use these data first to document the patterns of migration flows in the sub-region, second to estimate the determinants of

migration behaviour across these countries and to correct the estimated returns
to education for the endogeneity of locational choice. We finally estimate a
structural model to evaluate the impact of expected earnings differentials on
the probability of selecting a particular country to reside in.

Our results show that, despite the severe political crisis that started in
1999, Cote d'Ivoire remains the most important immigration country in the
sub-region. Our data also suggests that Mali and Burkina Faso have been and
still are major labour-exporting countries, largely towards Cote d'Ivoire. Benin
and Togo, by contrast, combine both emigration and immigration. Looking at
migrants characteristics we find that migrants tend to be less educated than
non migrants in both their origin and destination country. Thus cross-border
migration within the sub-region seems to concern mainly low educated individ-
uals. They are more likely than natives to work in the informal sector and they
receive lower wages.

Our econometric results suggest that not holding account of international
migration in estimating returns to education yields upward biased estimates in
three countries out of seven and downward biased estimates in two others. How-
ever, disparities in returns to education between capital cities do not vanish,
suggesting that country-specific amenities and other unmeasurable non-wage
variables play important roles in the locational choice of individuals with differ-
ent levels of education. We also find that expected earnings differentials have a
very significant effect on the choice probabilities of our sample individuals: all
else equal, they tend to live in cities in which their expected earnings are higher
than elsewhere. Of course, the sample we use is not a random sample of indi-
viduals from the WAEMU region as a whole and the destinations we consider

are not the whole universe of potential destinations. Still, while development economics is full of examples of apparently irrational behavior, our results on the locational choice of a large sample of West Africans suggest that individuals in developing countries do not always deviate from the standard economic model.

Acknowledgments

References

Adebusoye, P. M. (2006), 'Geographic Labour Mobility in Sub-Saharan Africa'. IDRC Working Papers on Globalization, Growth and Poverty.

Adepoju, A. (2005), 'Migration in West Africa'. Paper prepared for the Policy Analysis and Research Programme of the Global Commision on International Migration.

African Union (2005), Draft Strategic Framework for a Policy on Migration in Africa, Third ordinary session of the Labour and Social Affairs Commission, 18-23 April, 2005. Pretoria, South Africa.

Amegashie, F., Brilleau, A., Coulibaly, S., Koriko, O., Ouedraogo, E., Roubaud, F. & Torelli, C. (2005), 'La conception et la mise en oeuvre des enquêtes 1-2-3 en UEMOA. Les enseignements méthodologiques.', *Stateco* **99**.

Borjas, G. (1987), 'Self selection and the earnings of migrants', *American Economic Review* **77**(4), 531–553.

Bourguignon, F., Fournier, M. & Gurgand, M. (2004), 'Selection bias corrections based on the multinomial logit model: Monte-carlo comparisons'. mimeo.

Brilleau, A., Roubaud, F. & Torelli, C. (2005), 'L'emploi, le chômage et les conditions d'activité: l'enquête 1-2-3, phase 1', *Stateco* **99**.

Dahl, G. (2002), 'Mobility and the returns to education: testing a Roy model with multiple markets', *Econometrica* **70**, 2367–2420.

Gourieroux, C. & Monfort, A. (1995), Statistics and econometric models, Cambridge University Press.

Harris, J. & Todaro, M. (1970), 'Migration, unemployment and development : a two-sector analysis', *American Economic Review* **60**, 126–142.

Heckman, J. (1979), 'Sample selection bias as a specification error', *Econometrica* **47**, 153–161.

International Organisation for Migration (2003), World Migration 2003: Challenges and Responses for People on the Move, IOM, Geneva.

Lee, L. (1983), 'Generalized econometric models with selectivity', *Econometrica* **51**, 507–512.

Roy, A. (1951), 'Some thoughts on the distribution of earnings', *Oxford Economic Papers* **3**, 135–146.

Schmertmann, C. (1994), 'Selectivity bias correction methods in polychotomous sample selection models', *Journal of Econometrics* **60**, 101–132.

Sjaastad, L. A. (1962), 'The costs and returns of human migration', *Journal of Political Economy* **70**, 80–93.

Todaro, M. (1969), 'A model of labor migration and urban unemployment in less developed countries', *American Economic Review* **59**, 138–148.

Wooldridge, J. M. (2000), Introductory econometrics. a modern approach 2e, Thomson South Western.

World Bank (2003), World Development Indicators cd-rom, World Bank, Washington DC.

Appendix: 1-2-3 Surveys Sampling Method

The sample of surveyed households in each capital city is a stratified one. Census sectors were first randomly selected based on last population censuses and households were then randomly selected from a door-to-door listing within each census block. In each capital city, 125 census sectors and 20 households in each census sector were selected (except for Cotonou were 24 households instead of 20 were selected). The total number of census sectors varies between capital cities: 464 in Cotonou, 713 in Ouagadougou, 2,483 in Abidjan, 993 in Bamako, 368 in Niamey, 2,041 in Dakar and 129 in Lome.

Table 1 - Composition of national samples

	Number of sample individuals coming from:									Total number of immigrants	Total number of natives	Total sample size
	Benin	Burkina Faso	Cote d'Ivoire	Mali	Niger	Senegal	Togo	Other	n.d.			
Benin (Cotonou)	-	3	6	15	58	3	102	138	18	343	**6 994**	7 337
of which WAEMU nationals [*]	-	**3**	**6**	**15**	**55**	**2**	**100**	38	16	235		
Burkina Faso (Ouagadougou)	11	-	7	8	2	1	16	18	11	74	**8 198**	8 251
of which WAEMU nationals	**6**	-	**7**	**7**	**0**	**1**	**16**	5	7	49		
Cote d'Ivoire (Abidjan)	53	446	-	256	90	72	87	310	133	1447	**5 974**	7 416
of which WAEMU nationals	**52**	**428**	-	**231**	**85**	**65**	**79**	120	124	1184		
Mali (Bamako)	8	14	11	-	8	12	0	62	8	123	**7 148**	7 272
of which WAEMU nationals	**3**	**13**	**10**	-	**6**	**11**	**0**	36	6	85		
Niger (Niamey)	76	49	4	122	-	5	59	52	26	393	**7 710**	8 106
of which WAEMU nationals	**67**	**49**	**4**	**119**	-	**5**	**48**	27	23	342		
Senegal (Dakar)	11	0	2	9	0	-	4	130	53	209	**11 773**	11 977
of which WAEMU nationals	**7**	**0**	**2**	**9**	0	-	**1**	74	35	128		
Togo (Lome)	88	9	9	11	50	3	-	113	23	306	**5 927**	6 254
of which WAEMU nationals	**87**	**9**	**8**	**11**	**44**	**3**	-	24	21	207		
Total	247	521	39	421	208	96	268	823	272			
of which WAEMU nationals	222	502	37	392	190	87	244	324	232			

Source: 1-2-3 Surveys, 1st round, 2001-2003, National Statistical Institutes, AFRISTAT and DIAL. Authors' computations.

Note: All individuals aged 15-65. Are considered as natives of country *i* all individuals who have always been residing in country *i*, whether they declare having the country's citizenship or not. In bold are all sample individuals who will be considered in the analysis.

(*) Within the sample of immigrants coming from one of the six WAEMU countries, some individuals are not WAEMU nationals (*Exemple*: A French national who spent 10 years in Burkina Faso before moving to Benin is recorded as an immigrant coming from Burkina Faso but is not Burkinabe).

Table 2 - (Weighted) share of immigrants among urban residents by WAEMU country (%)

	Bénin	Burkina	Côte d'Ivoire	Mali	Niger	Sénégal	Togo
Natives	96,4	99,3	84,1	98,4	95,6	98,5	95,5
Immigrants	3,6	0,7	15,9	1,6	4,4	1,6	4,5
of which:							
coming from WAEMU	60,6	70,7	73,5	43,8	85,7	13,0	60,7
coming from other developing countries	36,4	23,9	25,2	43,4	12,2	83,9	38,8
coming from developed countries	3,1	6,2	1,3	12,6	2,2	3,1	0,8

Source: 1-2-3 Surveys, 1st round, 2001-2003, National Statistical Institutes, AFRISTAT and DIAL. Authors' computations.

Table 3 - Composition of migrants' stocks at the national level, by WAEMU country

	Number of individuals coming from… as a share of total								Total number of immigrants
	Benin	Burkina Faso	Cote d'Ivoire	Mali	Niger	Senegal	Togo	Total	
Benin	-	4,7	20,0	5,1	25,3	0,4	44,5	100,0	57 971
Burkina Faso	10,2	-	4,9	61,1	19,3	1,9	2,7	100,0	717 271
Cote d'Ivoire	3,7	58,8	-	29,3	7,8	0,2	0,1	100,0	1 661 157
Mali	18,8	49,4	3,2	-	17,8	4,5	6,3	100,0	22 529
Niger	15,9	17,1	7,8	55,3	-	1,3	2,5	100,0	60 922
Senegal	4,8	12,2	1,0	76,1	4,4	-	1,5	100,0	31 077
Togo	77,8	0,8	0,1	2,9	18,1	0,3	-	100,0	92 234
Total number of emigrants	221 362	1 006 194	52 335	987 480	305 471	20 198	50 121	2 643 161	

Source: Census data, circ. 2000.

Table 4 - Mean characteristics of natives and immigrants by country of residence

	Benin Natives	Benin Immigrants		Burkina Faso Natives	Burkina Faso Immigrants		Cote d'Ivoire Natives	Cote d'Ivoire Immigrants		Mali Natives	Mali Immigrants		Niger Natives	Niger Immigrants		Senegal Natives	Senegal Immigrants		Togo Natives	Togo Immigrants	
% of males	48,2	42,5		50,7	54,1		47,6	61,5	*	49,1	51,1		48,6	43,5		47,1	47,4		47,6	56,2	*
Age in years	31,1	30,8		30,2	30,4		29,0	34,6	*	31,2	30,4		30,7	33,9	*	30,9	33,9		30,4	30,9	
Education and experience																					
Experience in years	18,5	21,3		19,1	18,7		16,4	26,6	*	20,3	18,1		19,6	25,5	*	19,5	19,4		17,7	20,4	*
Years of schooling	6,6	3,6	*	5,1	5,7		6,6	2,0	*	4,8	5,8		5,1	2,3	*	5,3	8,6	*	6,6	4,5	*
% with no diploma	45,8	72,4	*	54,3	54,1		44,7	83,5	*	58,4	55,8		60,9	81,5	*	60,2	31,6	*	42,8	63,0	*
% with completed primary education	26,7	14,9	*	24,6	13,5		27,6	10,2	*	19,2	16,3		20,3	11,6	*	18,5	15,8		31,9	24,7	*
% with BEPC	13,2	6,1	*	11,3	18,9		10,4	2,7	*	8,1	4,7		7,2	2,4	*	11,0	21,1		14,7	5,6	*
% with baccalaureat	4,0	3,9		1,6	0,0		4,8	0,6	*	2,2	7,0	*	2,6	0,0	*	3,8	5,3		3,2	1,2	
Can read&write in French	71,6	37,0	*	59,6	64,9		73,8	28,5	*	49,2	51,2		56,5	29,8	*	60,4	73,7		73,7	53,7	*
Can read&write in a foreign language	24,5	26,5		13,3	24,3	*	25,0	10,9	*	12,2	34,9	*	21,6	18,2		19,3	47,4	*	27,1	22,2	
Religion																					
% of muslim	9,9	47,0	*	55,8	37,8	*	31,2	73,3	*	97,2	79,1	*	98,2	76,4	*	93,3	57,9	*	9,6	45,7	*
% of catholic	67,2	31,5	*	36,2	18,9	*	35,9	17,8	*	1,8	18,6	*	1,2	19,5	*	6,6	42,1	*	47,6	24,7	*
% of protestant	5,2	3,9		6,5	27,0	*	10,7	3,4	*	0,5	2,3		0,4	3,4	*	0,1	0,0		10,2	0,6	*
Number of observations	6 994	181		8 198	37		5 974	940		7 148	43		7 710	292		11 773	19		5 927	162	

Source: 1-2-3 Surveys, 1st round, 2001-2003, National Statistical Institutes, AFRISTAT and DIAL. Authors' computations.

A "*" means that the difference is statistically significant

Table 5 - Mean characteristics of natives and emigrants by country of residence

	Benin Natives	Benin Emigrants		Burkina Faso Natives	Burkina Faso Emigrants		Cote d'Ivoire Natives	Cote d'Ivoire Emigrants		Mali Natives	Mali Emigrants		Niger Natives	Niger Emigrants		Senegal Natives	Senegal Emigrants		Togo Natives	Togo Emigrants	
% of males	48,2	44,6		50,7	58,4	*	47,6	54,1		49,1	57,4	*	48,6	67,9	*	47,1	71,2	*	47,6	38,5	*
Age in years	31,1	32,8	*	30,2	34,7	*	29,0	27,9		31,2	34,9	*	30,7	31,7		30,9	37,4	*	30,4	30,2	
Education and experience																					
Experience in years	18,5	21,5	*	19,1	27,0	*	16,4	15,4		20,3	27,7	*	19,6	23,4	*	19,5	26,9	*	17,7	20,0	*
Years of schooling	6,6	5,3	*	5,1	1,8	*	6,6	6,5		4,8	1,2	*	5,1	2,3	*	5,3	4,1	*	6,6	4,2	*
% with no diploma	45,8	55,9	*	54,3	86,5	*	44,7	43,2		58,4	90,3	*	60,9	81,6	*	60,2	65,5		42,8	67,2	*
% with completed primary education	26,7	23,4		24,6	9,0	*	27,6	21,6		19,2	6,4	*	20,3	11,6	*	18,5	14,9		31,9	19,3	*
% with BEPC	13,2	8,6	*	11,3	2,2	*	10,4	8,1		8,1	1,0	*	7,2	2,6	*	11,0	6,9		14,7	7,0	*
% with baccalaureat	4,0	0,9	*	1,6	0,4	*	4,8	8,1		2,2	0,3	*	2,6	1,1		3,8	6,9		3,2	0,8	*
Can read&write in French	71,6	57,2	*	59,6	27,9	*	73,8	64,9		49,2	16,1	*	56,5	27,9	*	60,4	51,7		73,7	48,0	*
Can read&write in a foreign language	24,5	18,9		13,3	8,2	*	25,0	37,8	*	12,2	13,3		21,6	31,9	*	19,3	21,8		27,1	18	*
Religion																					
% of muslim	9,9	25,2	*	55,8	69,5	*	31,2	51,4	*	97,2	99,2	*	98,2	96,3		93,3	86,2	*	9,6	24,2	*
% of catholic	67,2	38,7	*	36,2	26,1	*	35,9	16,2	*	1,8	0,3	*	1,2	1,6		6,6	10,3		47,6	44,3	
% of protestant	5,2	6,8		6,5	2,2	*	10,7	2,7		0,5	0,5		0,4	0,5		0,1	1,1	*	10,2	12,3	
Number of observations	6 994	222		8 198	502		5 974	37		7 148	392		7 710	190		11 773	87		5 927	244	

Source: 1-2-3 Surveys, 1st round, 2001-2003, National Statistical Institutes, AFRISTAT and DIAL. Authors' computations.

A "*" means that the difference is statistically significant

Table 6a - Mean education level of migrants by origin and destination countries (in years)

	Mean education level (in years) of individuals coming from:							All immigrants
	Benin	Burkina Faso	Cote d'Ivoire	Mali	Niger	Senegal	Togo	
Benin (Cotonou)	**6,6**	4,7	10,8	1,9	**2,6**	13,0	**3,8**	**3,6**
Burkina Faso (Ouagadougou)	8,7	**5,0**	5,6	2,4	na	10,0	5,9	**5,7**
Côte d'Ivoire (Abidjan)	**6,5**	**1,5**	**6,6**	**1,1**	**1,0**	3,6	**4,2**	**2,0**
Mali (Bamako)	13,0	4,6	1,5	**4,7**	13,0	5,3	na	**5,8**
Niger (Niamey)	**3,5**	**2,6**	4,0	**0,8**	**5,0**	1,5	**4,2**	**2,3**
Senegal (Dakar)	11,7	na	15,5	3,9	na	**5,2**	15,0	8,6
Togo (Lome)	**5,0**	3,8	9,5	2,5	**3,1**	7,7	**6,6**	**4,5**
All emigrants	**5,3**	**1,8**	**6,5**	**1,2**	**2,3**	**4,1**	**4,2**	

Notes: in bold are figures computed on samples exceeding 30 observations.
In grey are figures computed on nonmigrant natives.

Table 6b - Share of males among migrants by origin and destination countries

	Percentage of males among individuals coming from:							All immigrants
	Benin	Burkina Faso	Cote d'Ivoire	Mali	Niger	Senegal	Togo	
Benin (Cotonou)	**48,4**	33,3	66,7	53,3	**65,5**	50,0	**27,0**	**42,5**
Burkina Faso (Ouagadougou)	66,7	**51,0**	42,9	42,9	na	100,0	56,3	**54,1**
Côte d'Ivoire (Abidjan)	**53,8**	**59,8**	**48,1**	**60,2**	**72,9**	73,8	**54,4**	**61,3**
Mali (Bamako)	66,7	38,5	60,0	**49,7**	50,0	54,5	na	**51,2**
Niger (Niamey)	**29,8**	**53,1**	25,0	**52,1**	**48,8**	60,0	**31,3**	**43,5**
Senegal (Dakar)	42,9	na	50,0	55,6	na	**47,3**	0,0	47,4
Togo (Lome)	**48,3**	55,6	62,5	72,7	**63,6**	100,0	**47,7**	**56,2**
All emigrants	**44,6**	**58,4**	**54,1**	**57,4**	**67,9**	**71,3**	**38,5**	

Notes: in bold are figures computed on samples exceeding 30 observations.
In grey are figures computed on nonmigrant natives.

Table 6c - Share of uneducated females among migrants by origin and destination countries

	Percentage of uneducated females among individuals coming							All immigrants
	Benin	Burkina Faso	Cote d'Ivoire	Mali	Niger	Senegal	Togo	
Benin (Cotonou)	**30,2**	33,3	0,0	46,7	**23,6**	0,0	**62,0**	**45,9**
Burkina Faso (Ouagadougou)	0,0	**31,2**	42,9	57,1	na	0,0	37,5	**35,1**
Côte d'Ivoire (Abidjan)	**26,9**	**37,6**	**30,0**	**39,0**	**25,9**	16,9	**32,9**	**34,5**
Mali (Bamako)	0,0	38,5	30,0	**34,3**	0,0	18,2	na	**23,3**
Niger (Niamey)	**64,2**	**38,8**	75,0	**45,4**	**34,2**	20,0	**58,3**	**50,7**
Senegal (Dakar)	0,0	na	0,0	33,3	na	**35,7**	0,0	15,8
Togo (Lome)	**37,9**	33,3	0,0	27,3	**27,3**	0,0	**30,7**	**31,5**
All emigrants	**40,5**	**37,6**	**24,3**	**41,1**	**24,7**	**16,1**	**50,0**	

Notes: in bold are figures computed on samples exceeding 30 observations.
In grey are figures computed on nonmigrant natives.

Table 7 - Employment situation of natives and immigrants, by country of residence

	Benin Natives	Benin Immigrants	Burkina Faso Natives	Burkina Faso Immigrants	Cote d'Ivoire Natives	Cote d'Ivoire Immigrants	Mali Natives	Mali Immigrants	Niger Natives	Niger Immigrants	Senegal Natives	Senegal Immigrants	Togo Natives	Togo Immigrants
Employment situation														
% of employed	68,0	71,3	56,6	56,8	59,7	77,9	57,5	58,1	47,5	65,7	50,4	57,9	70,6	74,7
% of unemployed	4,1	2,2	11,0	16,2	11,4	4,7	4,2	2,3	7,9	3,8	7,5	0,0	6,7	3,7
% of inactive	27,9	26,5	32,3	27,0	28,8	17,5	38,4	39,5	44,6	30,5	42,1	42,1	22,6	21,6
Number of observations	6 994	181	8 198	37	5 974	940	7 148	43	7 710	292	11 773	19	5 927	162
Sector of activity & wage of the employed														
% in the public sector	8,8	0,0	13,9	9,5	8,4	1,0	11,5	4,0	17,9	1,0	9,0	0,0	8,1	1,7
% in the formal private sector	11,6	10,9	9,0	19,1	21,4	12,7	11,7	8,0	13,6	10,4	17,6	36,4	8,2	12,4
% in the informal private sector	79,5	89,1	77,1	71,4	70,2	86,3	76,8	88,0	68,5	88,6	73,4	63,6	83,8	86,0
Hourly wage in PPP CFA Francs	255	182	271	240	467	276	347	578	337	234	417	754	192	255
Number of observations	4 759	129	4 642	21	3 569	732	4 107	25	3 664	192	5 935	11	4 186	121

Source: 1-2-3 Surveys, 1st round, 2001-2003, National Statistical Institutes, AFRISTAT and DIAL. Authors' computations.

Table 8 - Individual residential choice: reduced form multinomial logit estimates

	Cotonou (Benin)	Ouagadougou (Burkina Faso)	Abidjan (Côte d'Ivoire)	Bamako (Mali)	Niamey (Niger)	Lome (Togo)
Sex (1: Male)	0.97***	0.76**	1.35***	0.20	0.34	1.14***
	(0.33)	(0.31)	(0.29)	(0.32)	(0.32)	(0.33)
CEP (Primary school completed)	-0.67	0.43	-0.20	-0.04	-0.35	-0.12
	(0.50)	(0.49)	(0.45)	(0.51)	(0.50)	(0.49)
BEPC (GCSE)	-1.06	0.87	-0.25	0.01	-0.79	-0.49
	(0.65)	(0.67)	(0.58)	(0.71)	(0.67)	(0.65)
CAP	-1.03	1.73	0.60	1.77	0.08	-1.04
	(1.17)	(1.19)	(1.07)	(1.19)	(1.19)	(1.16)
BEP	-3.20	1.09	-1.05	0.52	-0.81	-0.24
	(2.06)	(2.09)	(1.95)	(1.91)	(1.99)	(2.00)
Baccalaureate	1.24	2.32***	1.10*	1.35	1.37*	1.60**
	(0.80)	(0.89)	(0.60)	(0.88)	(0.79)	(0.77)
Foundation degree	-2.62	1.07	-0.43	0.21	-0.86	-1.49
	(1.82)	(1.91)	(1.77)	(1.84)	(1.85)	(1.84)
Bachelor's degree	-1.53	0.84	-0.43	0.51	-0.07	-1.20
	(1.00)	(1.03)	(0.92)	(1.00)	(0.99)	(1.00)
Postgraduate degree	-5.51***	-4.01***	-4.88***	-3.85***	-3.99***	-5.45***
	(1.02)	(1.17)	(1.06)	(1.07)	(1.06)	(1.07)
Marital status (1: Married)	-0.34	-0.65**	-0.83***	-0.08	-0.42	-0.45
	(0.35)	(0.33)	(0.30)	(0.33)	(0.34)	(0.34)
Speaks French (1=Yes)	-0.16	-0.08	-0.29	-0.05	0.22	0.22
	(0.40)	(0.37)	(0.34)	(0.39)	(0.39)	(0.39)
Speaks another Foreign Language (1=Yes)	1.19***	0.07	0.20	-0.08	0.23	1.06***
	(0.41)	(0.41)	(0.35)	(0.39)	(0.40)	(0.41)
Experience (in years)	0.04	0.03	0.16***	-0.04	0.08*	0.04
	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Experience Squared	-0.00	-0.00	-0.002***	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Public sector	-0.18	0.52	-1.60***	0.26	-0.16	-0.29
	(0.63)	(0.66)	(0.59)	(0.63)	(0.62)	(0.62)
Private sector	0.14	-0.84**	-0.17	0.28	0.19	-0.24
	(0.42)	(0.38)	(0.35)	(0.39)	(0.40)	(0.41)
Father in the agricultural sector	0.12	-0.07	0.72**	-0.41	-0.02	0.20
	(0.39)	(0.38)	(0.35)	(0.38)	(0.38)	(0.39)
Father in the industrial sector	-0.85	-0.80	-0.05	-0.52	-0.40	-0.68
	(0.60)	(0.62)	(0.52)	(0.60)	(0.60)	(0.60)
Father in the commercial sector	0.81	1.20***	1.38***	0.97**	0.63	1.15**
	(0.43)	(0.41)	(0.35)	(0.42)	(0.41)	(0.43)
Father was a top executive	0.34	1.99**	1.20**	1.27*	1.07	0.67
	(0.72)	(0.79)	(0.59)	(0.73)	(0.73)	(0.72)
Father was a middle executive	0.48	0.22	0.02	0.61	0.61	-0.08
	(0.64)	(0.66)	(0.58)	(0.65)	(0.64)	(0.63)
Father was absent at age 15	1.47***	0.35	1.01**	0.69	0.63	1.14**
	(0.54)	(0.53)	(0.48)	(0.53)	(0.53)	(0.54)
Father never went to school	-0.56	0.31	-0.59*	-0.69*	0.10	-0.91**
	(0.37)	(0.37)	(0.34)	(0.38)	(0.38)	(0.37)
Father schooling is missing	-7.09***	-3.72***	-4.62***	-2.79***	-3.05***	-3.75***
	(0.77)	(0.69)	(0.65)	(0.65)	(0.68)	(0.70)
Muslim	-6.00***	-5.55***	-5.74***	-5.72***	-3.18*	-6.88***
	(1.80)	(1.82)	(1.78)	(1.84)	(1.84)	(1.79)
Catholic	-4.15**	-4.57**	-4.97***	-4.97**	-3.20*	-5.37***
	(1.82)	(1.84)	(1.80)	(1.88)	(1.86)	(1.81)
Protestant	-2.47	-0.92	-1.93	-2.65	-0.83	-3.39
	(2.17)	(2.19)	(2.15)	(2.25)	(2.22)	(2.16)
Nationality dummies	*Included but not shown*					
Intercept	-3.98***	-4.83**	-1.62	-0.92	-6.01***	-2.35***
	(2.21)	(2.23)	(1.94)	(2.03)	(2.10)	(2.03)
Observations	31 647	31 647	31 647	31 647	31 647	31 647

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
Dependent variable takes value 1 (Benin) to 7 (Togo), with category 6 (Senegal) used as the comparison category.

Table 9 - OLS Log-earnings Regression: uncorrected (1st column) and corrected (2nd column) estimates (selected results)

	Cotonou (Benin)		Ouagadougou (B. Faso)		Abidjan (Côte d'Ivoire)		Bamako (Mali)		Niamey (Niger)		Dakar (Senegal)		Lome (Togo)	
Sex (1: Male)	0.46***	0.45***	0.41***	0.31***	0.40***	0.44***	0.33***	0.30***	0.23***	0.28***	-0.15***	-0.18***	0.31***	0.28***
	(0.04)	(0.04)	(0.05)	(0.08)	(0.05)	(0.05)	(0.04)	(0.06)	(0.05)	(0.07)	(0.05)	(0.05)	(0.05)	(0.07)
CEP (Primary school completed)	0.54***	0.50***	0.44***	0.45***	0.55***	0.55***	0.21***	0.23**	0.52***	0.53***	0.36***	0.36***	0.52***	0.52***
	(0.06)	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.07)	(0.10)	(0.09)	(0.13)	(0.07)	(0.08)	(0.07)	(0.08)
BEPC (GCSE)	1.00***	0.94***	1.31***	1.30***	1.17***	1.19***	0.53***	0.56***	1.07***	1.08***	0.58***	0.57***	1.11***	1.13***
	(0.09)	(0.09)	(0.11)	(0.12)	(0.10)	(0.08)	(0.11)	(0.13)	(0.14)	(0.13)	(0.09)	(0.09)	(0.10)	(0.10)
CAP	1.17***	1.07***	1.18***	1.19***	1.21***	1.19***	0.48***	0.54***	1.48***	1.42***	0.72***	0.74***	1.10***	1.24***
	(0.15)	(0.16)	(0.18)	(0.16)	(0.20)	(0.16)	(0.12)	(0.13)	(0.23)	(0.18)	(0.25)	(0.14)	(0.23)	(0.21)
BEP	0.95**	0.74**	1.74***	1.76***	1.13***	1.03***	0.98***	1.03***	1.30***	1.22***	0.86***	0.85***	1.34***	1.31***
	(0.47)	(0.35)	(0.25)	(0.25)	(0.20)	(0.14)	(0.11)	(0.12)	(0.20)	(0.20)	(0.26)	(0.20)	(0.24)	(0.18)
Baccalaureate	1.37***	1.35***	1.85***	1.86***	1.71***	1.66***	0.81***	0.81***	1.90***	1.90***	0.97***	1.05***	1.64***	1.63***
	(0.15)	(0.14)	(0.19)	(0.16)	(0.15)	(0.11)	(0.20)	(0.24)	(0.19)	(0.19)	(0.14)	(0.16)	(0.18)	(0.16)
Foundation degree[a]	2.14***	1.94***	2.14***	2.10***	2.08***	2.08***	1.00***	1.06***	1.90***	1.82***	1.17***	1.14***	2.72***	2.74***
	(0.20)	(0.21)	(0.22)	(0.24)	(0.15)	(0.12)	(0.16)	(0.14)	(0.25)	(0.22)	(0.26)	(0.22)	(0.28)	(0.19)
Bachelor's degree	1.98***	1.89***	2.41***	2.41***	2.30***	2.26***	1.42***	1.49***	2.26***	2.16***	1.40***	1.39***	2.53***	2.58***
	(0.13)	(0.13)	(0.16)	(0.12)	(0.13)	(0.10)	(0.12)	(0.13)	(0.14)	(0.11)	(0.14)	(0.12)	(0.16)	(0.13)
Postgraduate degree	1.74***	1.61***	1.62***	1.65***	1.81***	1.73***	1.15***	1.14***	1.98***	1.89***	1.39***	1.36***	2.20***	2.27***
	(0.18)	(0.17)	(0.23)	(0.22)	(0.21)	(0.18)	(0.23)	(0.22)	(0.18)	(0.15)	(0.18)	(0.13)	(0.27)	(0.21)
Marital status (1: Married)	0.65***	0.63***	0.36***	0.41***	0.28***	0.25***	0.43***	0.47***	0.45***	0.45***	0.36***	0.38***	0.48***	0.49***
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.04)	(0.05)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Speaks French (1: Yes)	0.14**	0.15*	0.40***	0.45***	0.06	0.06	0.21***	0.21**	0.24***	0.24***	0.30***	0.32***	0.08	0.07
	(0.06)	(0.09)	(0.07)	(0.08)	(0.06)	(0.07)	(0.06)	(0.08)	(0.07)	(0.08)	(0.06)	(0.07)	(0.07)	(0.07)
Speaks a foreign language (1: Yes)	0.36***	0.41***	0.32***	0.34***	0.19**	0.17***	0.13**	0.08	0.09	0.17*	0.34***	0.35***	0.04	0.01
	(0.07)	(0.07)	(0.08)	(0.09)	(0.07)	(0.06)	(0.06)	(0.09)	(0.08)	(0.09)	(0.07)	(0.07)	(0.07)	(0.08)
Experience (in years)	0.16***	0.15***	0.16***	0.14***	0.12***	0.13***	0.09***	0.08***	0.15***	0.15***	0.14***	0.14***	0.14***	0.15***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Experience squared	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.001***	-0.001***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Public sector	0.27***	0.32***	0.66***	0.76***	0.69***	0.50***	0.33***	0.38***	0.49***	0.46***	0.78***	0.84***	0.64***	0.65***
	(0.09)	(0.06)	(0.08)	(0.10)	(0.10)	(0.08)	(0.07)	(0.07)	(0.08)	(0.08)	(0.09)	(0.07)	(0.10)	(0.06)
Private sector	0.32***	0.34***	0.42***	0.47***	0.67***	0.65***	0.17***	0.20***	0.31***	0.30***	0.81***	0.83***	0.33***	0.33***
	(0.07)	(0.07)	(0.09)	(0.10)	(0.06)	(0.06)	(0.06)	(0.07)	(0.08)	(0.09)	(0.06)	(0.06)	(0.09)	(0.11)
Father in the agricultural sector	-0.02	-0.06	-0.21***	-0.29***	-0.08	-0.05	-0.11**	-0.18***	-0.01	-0.02	0.05	0.01	0.02	0.03
	(0.05)	(0.06)	(0.05)	(0.07)	(0.05)	(0.06)	(0.05)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Father in the industrial sector	0.15	0.10	-0.32**	-0.37*	-0.22**	-0.19**	-0.06	-0.06	-0.19	-0.21	-0.11	-0.12	-0.04	-0.02
	(0.09)	(0.12)	(0.16)	(0.19)	(0.09)	(0.10)	(0.09)	(0.12)	(0.14)	(0.21)	(0.07)	(0.08)	(0.10)	(0.13)
Father in the commercial sector	0.06	0.01	0.01	-0.03	-0.05	-0.02	0.10*	0.11*	-0.13	-0.11	0.01	-0.02	0.10	0.08
	(0.07)	(0.08)	(0.08)	(0.11)	(0.07)	(0.07)	(0.05)	(0.07)	(0.08)	(0.12)	(0.06)	(0.07)	(0.09)	(0.12)
Father was a top executive	0.28**	0.19	0.24	0.21	0.35**	0.35**	0.41***	0.43***	-0.20	-0.23	0.26**	0.27**	0.17	0.18
	(0.12)	(0.16)	(0.15)	(0.16)	(0.14)	(0.13)	(0.10)	(0.11)	(0.16)	(0.24)	(0.13)	(0.13)	(0.16)	(0.18)
Father was a middle executive	0.23***	0.25***	0.09	0.12	-0.12	-0.18*	0.15**	0.17***	-0.05	-0.07	0.09	0.10	-0.01	-0.01
	(0.07)	(0.07)	(0.12)	(0.13)	(0.09)	(0.10)	(0.07)	(0.06)	(0.11)	(0.10)	(0.09)	(0.09)	(0.09)	(0.11)
Observations	4 736	4 736	4 471	4 471	4 239	4 239	4 052	4 052	3 701	3 701	5 430	5 430	4 245	4 245
R-squared	0.44	0.44	0.39	0.40	0.41	0.41	0.32	0.32	0.39	0.40	0.34	0.34	0.34	0.35
Wald test for selection correction terms		17.3***		6.02		10.6*		11.0*		6.49		5.54		28.0***
Over-identification Wald Tests														
-Father dummies[b]		1.64		1.63		3.86		8.07**		2.03		1.05		10.1**
- Religion dummies		3.41		0.59		3.22		0.33		1.70		0.90		3.44
- Nationality dummies		4.61		7.72		5.48		2.45		7.60		0.02		7.17

Standard errors in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%
(a) These countries' university system derives from the French system, in which, until recently, second-year students could get a diploma. We refer to it as the "foundation" degree.
(b): Father was absent when individual was 15 ; father has no schooling ; father schooling is missing.

Table 10a – Individual residential choice: structural model estimates

	Estimated value of α
Uncorrected model	0.31* (0.16)
Corrected model	0.78*** (0.15)

Table 10b - Model simulation results

	% of movers with $m_{ic} > 50$	% of stayers with $s_{ic} > 50$
Country		
Benin	85	1
Burkina Faso	90	24
Ivory Coast	50	59
Mali	81	63
Niger	23	83
Senegal	7	68
Togo	6	31