Intergenerational mobility across time in five African countries

Thomas Bossuroy[♥]
Denis Cogneau[♠]
Victor Hiller[•]

February 2007

Preliminary Version for Comments

0/ Introduction

This paper proposes a first comparative measurement of the extent of intergenerational mobility in five countries of Sub-Saharan Africa: Côte d'Ivoire, Ghana, Guinea (Guinée-Conakry), Madagascar and Uganda. It also studies the evolution of intergenerational mobility across time, in particular between the colonial era and the post-colonial era, with some consideration for intragenerational occupational mobility. This is made possible by the availability of large-sample surveys built upon a common methodology and providing information on the social origins of the individuals interviewed: parents' education and occupation, and region of birth. We use a set of nine surveys that were implemented during a period ranging from the mid-1980s to the mid-1990s.

The analytical methods used here relate to that of quantitative sociological works dedicated to Western countries, in keeping with the groundbreaking Erickson and Goldthorpe (1992) comparative study. In the case of developing countries, the availability of relevant and reliable data makes the first explanation for the scarcity of similar studies. For this reason, comparisons in social mobility rarely go beyond the set of industrialized countries, most often to include some former-socialist European countries. Low-income, developing or sub-tropical countries enter the comparative databases with unrepresentative surveys, which are often restricted to urban areas or specific regions (see, e.g., Tyree, Semyonov and Hodge, 1979; Grusky and Hauser, 1984; Ganzeboom, Liujkx and Treiman, 1989). Apart from representativeness, comparability of occupational variables is also an issue (Goldthorpe, 1985).

Even today, only few large sample nationally representative surveys ask about the parental background of adult respondents. For the purpose of comparison among Latin American countries, Behrman, Gaviria and Szekely (2001) could only find four countries where this

[♥] EHESS, EEP, DIAL
[♠] IRD, DIAL, Paris
[•] University of Paris-I

kind of data had been collected on a comparable basis: Brazil, Colombia, Peru, and Mexico restricted to six big cities.[1] Asia does not seem much more documented either, with some exceptions for China (Cheng and Dai, 1995; Wu and Treiman, 2006) and India (Kumar, Heath and Heath, 2002a and 2002b). As for Africa, only South Africa has been until recently investigated in that dimension (Lam, 1999; Louw, Van der Berg and Yu, 2006).

We focus on differences in intergenerational mobility to and from the agricultural sector, what we call intergenerational dualism. Using some information on previous occupation, we also construct transition matrixes during the life cycle and analyze intragenerational dualism. Intergenerational dualism comes out as much lower in the two former British colonies, Ghana and Uganda, than in former French Côte d'Ivoire, Guinea and Madagascar. While already settled during the colonial era, the difference linked to the colonial power identity has dramatically increased after independence. For generations born after 1960, intergenerational dualism has increased in Côte d'Ivoire and Guinea, while remaining respectively at a fairly high level in Madagascar and at a relatively low level in Ghana and Uganda. Those conclusions are maintained when correcting for potential bias arising from intragenerational mobility. They also hold and are even reinforced when taking into account the role of education. The education needed to enter non-agricultural occupations has increased over time in the three former French colonies, whereas it has remained stable in the two former British. In contrast, barriers of entry linked to region of birth - north vs. south or else center vs. coast in Madagascar – have remained broadly similar in all countries. Last, intergenerational mobility into or out of "white collars" jobs seems to follow the same patterns as mobility into or out agriculture.

The remainder of the paper is organized as follows. Section 1 presents the survey data and the main variables of analysis. Section 2 provides an overview of occupational structures in the five countries and across time or age groups. Section 3 analyses intergenerational entries into and exits from agriculture and compares the five countries across time in terms of "intergenerational dualism". Section 4 discusses measurement bias linked to inactivity. Section 5 introduces education by examining educational development and educational intergenerational mobility in the five countries over 40 years. Section 6 introduces education and region of birth as additional correlates in the analysis of intergenerational dualism. Section 7 summarizes and concludes.

[1] The case of Brazil has been particularly investigated by sociologists: Pastore, 1982; Pastore and Valle Silva, 2000; Picanço, 2003, and economists: Bourguignon, Ferreira and Menendez, 2005; Dunn, 2003; Cogneau and Gignoux, 2007.

1/ Sample selection and variables construction

We use national household surveys that were carried out between 1985 and 1994 in the five countries we study, covering large representative samples on a national level. The countries and precise periods in question are Côte d'Ivoire from 1985 to 1988, Ghana in 1987 and 1992, Guinea in 1994, Madagascar in 1993 and Uganda in 1992. The Côte d'Ivoire, Ghana and Madagascar surveys are "integrated" Living Standard Measurement Surveys (LSMS) designed by the World Bank in the 1980s; the format of the two other for Guinea and Uganda is more or less inspired from them. In the more recent period and in many countries in Africa, surveys with smaller questionnaires have since been preferred for reasons of cost and feasibility, and unfortunately no longer include information on parental background. To our knowledge, the surveys that we selected are the only large sample nationally representative surveys in Africa that provide information on parental background for adult respondents. Appendix 1 provides further details on the surveys used.

They all provide a good deal of information about the main employment of the person interviewed. Homogenizing classifications proves however difficult. For this reason, we restrict the comparisons to very simple occupational distinctions. We focus on entries and exit from the agricultural sector. In the last section, we analyze access to "higher *salariat*" or "white collar" jobs: non-manual wage jobs in civil service, public or private enterprises. We also introduce education in the analysis and distinguish three levels: no education / primary level / middle or secondary level.

As for father's occupation, the differences between the available items in each survey drove us to retain only the distinction between farmers and non-farmers. Education of the father was also available but is not perfectly comparable between Côte d'Ivoire and the other countries, as the Côte d'Ivoire survey informs about the highest diploma when other surveys give the highest level attained.

In a first step, we restrict our analysis to adult aged between 20 and 69 and cohorts born between 1920 and 1970. In some respect, the old age of these surveys constitutes an advantage as it makes it possible to go back to the colonial era by analyzing cohorts born before the 1960s. We also focus on men, the analysis of intergenerational mobility of women being left for further research.

2/ Occupational structures across age groups, time and countries

The five countries under review have certain characteristics in common: they are of average size, do not have large mining resources and make most of their income from agricultural exports. However, the main features of the five countries' colonial and post-colonial histories are quite different.[2] Three were colonised by the French and two by the British in the late 19th century. However, the three former French colonies took different roads following independence. Côte d'Ivoire remained in the bosom of the franc zone and established itself as the main partner of the former colonial power in Africa. Guinea, on the other hand, chose to break with the past and introduce a form of socialist government. Madagascar, also outside the franc zone and its macroeconomic constraints, displayed a combination of the two ways of doing things: with initially close ties with the former coloniser followed by a break and a socialist-based government from 1975 through to the early 1990s. Ghana and Uganda had turbulent histories with political conflicts and severe macroeconomic crises through to the mid-1980s. Yet they share with Madagascar the fact that they are built on the foundations of the pre-colonial kingdoms (Ashanti, Buganda and Imerina). Côte d'Ivoire in 1988 was by far the wealthiest country with more than 1700 internal dollars per capita, followed by Ghana with around 1000, Madagascar (700), Uganda (600) and Guinea (500) (see Appendix 2).

Table 1 presents some indicators of the occupational structure for each cohort of the adult male population of each country.

The first panel shows employment rates. Not surprisingly, they are all U-curved in age, due respectively to retirement of older cohorts and ongoing education or queuing for first jobs in younger cohorts. Notice however the large variation across countries, and in particular the lower employment rate of Ivorian men at every age. Part of this variation may be attributed to unemployment on the one hand, and participation behaviour on the other.

The second panel shows the weight of agriculture in employment. Not surprisingly again, it is in every case decreasing with the year of birth, due to the process of urbanization. Here again, there is some variation across countries. Côte d'Ivoire and to a least extent Guinea show the widest gaps between the five generations considered: the weight of farmers shrinks from 68 to 40% in Côte d'Ivoire, from 71 to 50% in Guinea. West-African countries appear to have

[2] Appendix 2 provides a chronogram of political regimes, aside with some demographic and economic indicators for each country at the date of the survey.

experienced the most rapid expansion of non-agricultural jobs, whereas Uganda and Madagascar still have a largely predominant agricultural sector. When reaching the younger cohort, the trend of a decreasing weight of agriculture seems to make a pause, except in Uganda. This is of course explained by the higher rates of inactivity in this age group: Some urban young adults are still studying or queuing for non-agricultural jobs.

Table 1 – Occupational structures for each country and cohort

	Born in 1930-39	Born in 1940-49	Born in 1950-59	Born in 1960-69*
% not employed				
Côte d'Ivoire	8.5	6.4	11.8	20.5
Ghana	6.3	2.6	2.5	12.2
Guinea	9.9	2.8	3.7	14.6
Madagascar	4.8	2.0	0.9	4.9
Uganda	6.3	3.1	1.7	8.8
% in agriculture				
Côte d'Ivoire	68.4	53.5	40.7	42.9
Ghana	61.8	53.3	52.8	53.5
Guinea	70.8	63.4	53.5	47.5
Madagascar	82.3	73.0	72.2	75.7
Uganda	77.5	68.6	66.6	60.4
% in white collars jobs (among non-agricultural jobs)**				
Côte d'Ivoire	29.1	40.5	54.0	42.4
Ghana	42.4	39.8	37.9	31.2
Guinea	19.7	25.9	33.7	5.59
Madagascar	54.8	52.9	58.1	32.9
Uganda	31.2	45.0	36.7	36.1

Coverage: Men aged 20-69 born between 1930 and 1970.
*: This last cohort is restricted to men aged 25-28, for the samples to be strictly comparable between the surveys that were conduced at different dates. This leads us to only use the 1988 survey for Côte d'Ivoire, which appeared preferable than using the four Ivorian surveys and thus restricting our age group to the only 25 year-old men.
**: Non-manual wage jobs include all jobs paid with a wage in civil service, public and private enterprise, excepting blue collars and handcraft workers.

Last, the third panel shows the weight of "white collar" jobs among non-agricultural jobs. We defined this category as all jobs paid with a wage in civil service, public and private enterprise, excepting wage-paid blue collars and handcraft workers. Aside with the latter, the

remainder is made of numerous independent and self-employed jobs. In all countries, the younger cohort born after 1960 benefits less from those white collars jobs, despite its higher educational attainment (see section 4). This reflects that access to these jobs is rationed: young applicants queue for these kind of jobs; in the meantime, they are either inactive when they can afford it or else are working as apprentices, family help or self-employed. Furthermore, hiring in civil service and large enterprises was especially restricted in the period of economic crisis that opened in each country during the 1980s, the period at which the youngest cohort entered the labor market.

3/ Intergenerational dualism between agriculture and other occupations

3.1. A first measurement

This central section deals with intergenerational entry into, and exit from, the agricultural sector. In order to measure what we call intergenerational dualism, we construct 2x2 mobility tables crossing occupational origin (father being a farmer or not) and destination (son being a farmer or not). One odds-ratio can be derived from each 2x2 mobility table. It reflects the "pure" association between origin and destination, by expressing the relative probability for two individuals of different origins to reach a specific destination rather than another one. Odds-ratios allow comparing the strength of association between origin and destination across time and space, regardless of the fact that the weight of agriculture varies between countries or periods (see section 2 above). Let 0 and 1 index the two origins and the two destinations of the 2x2 mobility table, and let n_{ij} be the number of individuals of origin *i* and destination *j*. The odds-ratio of this table is defined:

$$OR = \frac{n_{11}/n_{10}}{n_{01}/n_{00}} = \frac{n_{11} \times n_{00}}{n_{01} \times n_{10}}$$

So as to observe the evolution of intergenerational dualism across time, we split our sample into a set of five cohorts built upon the date of birth of individuals.[3] Aggregated outflow tables are in Appendix 3. The odds-ratios for each of these cohorts are presented in Table 2.

Table 2 and Figure 1 separate three groups of country. In Madagascar, if one excepts the oldest cohort for which data is less reliable, intergenerational dualism seems to have remained

[3] Data for the 1920-30 cohort should be taken with caution given sample sizes and differential mortality linked to father's occupation.

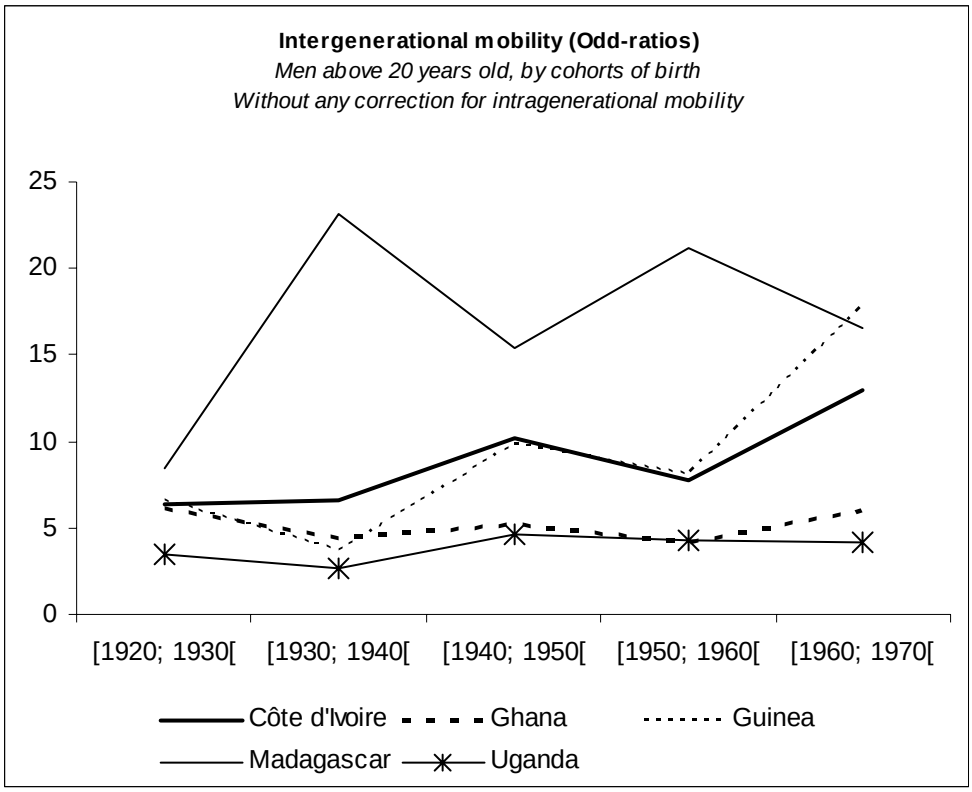
at very high levels throughout the colonial and post-colonial eras, with odds-ratios always above 15. The four remaining countries seem to share close starting points in the 1930-39 cohort. However, in the second group made of the two former British colonies, Ghana and Uganda, intergenerational dualism seems stable across time with relatively low odds-ratios, Whatever the cohort that is considered, the son of a farmer and the son of a non-farmer are 3 to 6 times more likely to reproduce their fathers' positions than to change them. In the third group of countries made the two Western former French colonies, Côte d'Ivoire and Guinea, intergenerational dualism seems to increase across time, bringing the odds-ratios of the 1950-59 cohorts to levels twice as high as in Ghana or Uganda. In the last and youngest cohort, intergenerational dualism is again doubled in both countries and catch-up with the level of Madagascar.

Table 2 – Intergenerational dualism across time: Odds-ratios

	[1920;1930[	[1930; 1940[	[1940; 1950[	[1950;1960[	[1960;1970[
Côte d'Ivoire	6,41 [2,68;15,35]	6,62 [3,64;12,03]	10,21 [5,68;18,35]	7,73 [4,88;12,25]	13,02 [8,32;20,37]
Ghana	6,09 [3,45;10,75]	4,44 [3,04;6,48]	5,26 [3,80;7,28]	4,20 [3,28;5,38]	6,00 [4,82;7,47]
Guinea	6,60 [1,77;24,61]	3,67 [2,15;6,24]	9,86 [6,01;16,16]	8,09 [5,78;11,32]	17,87 [7,48;20,06]
Madagascar	8,42 [2,33;30,49]	23,14 [11,27;47,52]	15,37 [8,96;26,35]	21,22 [14,18;31,77]	16,50 [10,97;24,82]
Ouganda	3,44 [1,57;7,53]	2,62 [1,65;4,16]	4,59 [3,35;6,28]	4,23 [3,31;5,39]	4,19 [3,52;4,97]

Reading: in Ivory Coast, two men born in the 1920's whose fathers were respectively a farmer and a non-farmer are 6 times more likely to reproduce their father's position than to exchange them.

Figure 1



3.2. Potential bias linked to inactivity

The method presented in the previous section provides a first measurement of the historical evolution of intergenerational mobility. It must however be completed on two levels: taking into account the level of inactivity and assessing intragenerational mobility (which will be done in the next section).

First, previous section excluded inactive or unemployed people from the analysis of intergenerational mobility. As Table 1 has shown that employment rates for each cohort vary from one country to another, this exclusion may introduce a bias in the comparisons. This kind of bias might particularly affect the relative position of Côte d'Ivoire where more than 20% of the youngest cohort is out of work.

Indeed, a counterfactual exercise where all inactive would be doomed to become farmers would drastically change the ranks of Côte d'Ivoire in all cohorts, and to a less extent of Guinea in the youngest cohort. Such an extreme counterfactual is of course not very sensible. Conversely, a counterfactual exercise where all inactive people are coded as non-agricultural workers leaves all odds-ratios almost intact (Table 3). At least, these counterfactual exercises

show that the inactive bias should only be a matter of worry for Côte d'Ivoire in the older cohorts, and for Côte d'Ivoire and Guinea in the youngest.

Table 3 – Counterfactual odds-ratios with recoding of inactive people

	Born before 1960		Born after 1960	
	Inactive coded as farmer	Inactive coded as non-farmer	Inactive coded as farmer	Inactive coded as non-farmer
Côte d'Ivoire	**3.7**	**9.2**	**2.2**	**15.9**
Ghana	3.8	4.6	3.7	6.3
Guinea	5.8	6.8	**4.6**	**20.7**
Madagascar	17.5	19.1	12.6	18.3
Uganda	3.6	3.8	3.6	4.0

Coverage: Men aged 20-69 born between 1930 and 1970.

Table 6 shows the father's occupation and education profiles of inactive people and compares them with those of people not working in agriculture. This table reveals that in every country except Côte d'Ivoire, inactive men in older cohorts are significantly less educated than non-agricultural workers. In that respect they are closer to the average population. In Côte d'Ivoire they show the same average education as non-agricultural workers. In Côte d'Ivoire and Ghana, older inactive men also have less often a father farmer. In the case of older cohorts, we thus have no reason to believe that Ivorian inactive men should be considered as "hidden" agricultural workers, so that the selection bias due to retirement or to missing occupations should be rather limited.

3.3. Intragenerational dualism

Comparing the situation of two men born at different periods on the basis of a unique observation (at the time of the survey) leads to mix up two different effects: one is the evolution of intergenerational mobility; the other one is the individuals' occupational mobility along their own career. This simple comparison does not take into account the fact that individuals are not observed at the same point of their life cycle: a 20 years old man may be less likely to have reached a non-agricultural position than a 60 timer, if people tend to move to urban areas during their lives; or a young man may be more likely to be non-farmer than an older man if men come back to land after some age and after having earned their lives in non-agricultural occupation.

Moreover, the relative chance to get out of agriculture during the work career may depend on father's occupation. It might be that the weight of origin decreases with age, in which case odds-ratios of younger cohorts would be biased upward. Conversely, if social origin not only determines the starting point but also the career of individuals, divergence of social origins is underestimated at younger ages. We must therefore take into account intragenerational mobility so as to compare every individual as if he had ended his work career.

Even if we do not observe individual trajectories over time, intragenerational mobility is partially observed in the surveys thanks to an "employment history" section, except in Uganda. In the four other countries, we are able to construct mobility matrixes crossing the current occupation (farmer / non-farmer) of the respondent and the previous one (farmer / non-farmer/inactive), for each decennial age group and each father's occupation (farmer / non-farmer). Including the inactive is crucial as youngest cohorts present high rates of inactivity (see Table 1).

Employment retrospective is however imperfect, as it is both left-censored and right-censored. On the left, only the duration of the current occupation is known; then, for individuals who moved only recently, the previous one is not necessarily occupation ten years ago.[4] On the right and most importantly, as we need a forecast of employment histories for younger cohorts, we are obliged to make the assumption of a constant intragenerational mobility across time, for a given social origin. This latter assumption seems however weaker than that of a "neutral" intragenerational mobility, i.e. intragenerational mobility being independent of father's origin.

Let O (origin) be the occupation of the father, D* (destination) the occupation of the respondent when he enters the job market and D the occupation of the respondent at the end of his work career.

Let V_O be the vector of origins, i.e. the vector of the father's occupation. In our specific case, V_o is a (2,1) vector composed of two possible occupations: farmer and non-farmer, except for the youngest cohorts where it is a (3,1) vector composed of three possible occupation: farmer, non-farmer and inactive. V_D and V_{D*} are defined the same way. These vectors are related as follows:

[4] The ten years ago occupation is derived from the answer to the following questions: "What job did you do before the one you have today?" and "For how long do you do your current occupation?" The occupation exerted ten years ago is taken as agricultural (resp. non-agricultural) if the respondent exerts his current occupation for more than ten years AND this current occupation is agricultural (resp. non-agricultural), or if the respondent exerts his current occupation for less than ten years AND the previous occupation is agricultural (resp. non-agricultural).

$$V_{D*} = V_O \,.\, M_{O*}$$

$$V_D = V_{D*} \,.\, M_{*D}$$

where M_{O*} is the "pure" intergenerational transition matrix that crosses the father's occupation and the son's occupation *at the time he enters the job* market, and M_{*D} is the intragenerational transition matrix, that crosses the son's occupation when he enters the job market and his occupation *at the time he retires*. The problem is that we do not observe the occupation of the respondent at the time he begins or ends his work career, but at a given age *j* within his life. We only measure:

$$V_{Dj} = V_O \,.\, M_{Oj}$$

$$V_D = V_{Dj} \,.\, M_{jD}$$

where V_{Dj} is the vector of occupations observed at the time *j*.

In this case, M_{Oj} is the matrix that crosses the father's occupation and the son's occupation at the time of the survey, and M_{jD} is the transition matrix between the occupation observed at the time of the survey and the occupation at the end of the professional life. We call it the "residual transition matrix" and propose an estimate for it in what follows.

We infer from the previous equations:

$$V_D = V_O \,.\, M_{inter}$$

Where:

$$M_{inter} = M_{Oj}\, M_{jD}$$

and we call M_{inter} the "corrected intergenerational matrix". This is the matrix we would like to measure for every cohort of individuals: by comparing every individual at the end of his work career, it would take into account both the direct effect of origin, that affects the son's occupation has at the time he enters the labour market, and its indirect effect, that affects the occupational mobility experienced by the son during his lifetime. We therefore need an assessment of intragenerational mobility, so as to explore the sensitivity of comparisons between cohorts.

If we could build yearly intragenerational mobility matrixes, we would write:

$$M_{jD} = \prod_{t=j}^{D-1} M_{t,t+1}$$

But the sample sizes forbid this solution.

Another solution could be to constrain the different $M_{t,t+1}$ to be uniform: $M_{t,t+1} = \frac{M_{OD}}{n}$ where M_{OD} is the total intragenerational matrix and *n* the number of years of activity. We would then obtain: $M_{\text{int}er} = M_{Oj}.(n-j)M_{t,t+1}$. But making intragenerational matrixes be uniform along the life cycle is too strong an assumption. That mobility evolves across time is the most likely: the transition from an agricultural occupation to a non-agricultural occupation may be more frequent at the beginning of the professional life when young people are eager to try their luck in urban areas than during the last years of their career.

We therefore build transition matrixes for decennial age groups, that cross the current respondent's occupation and the occupation he had ten years earlier. We can then construct five decennial intragenerational matrixes for each country. Thus M_1 gives the mobility between [20-29[years old and [30-39[years old, M_2 between [30-39[years old and [40-49[years old, M_3 between [30-39[years old and [40-49[years old and the last one M_4 provides the mobility from [50-59[years old and [60-69[years old.

Under the assumption of constant intragenerational mobility over time, the residual intragenerational transition matrix reads:

$$M_{iD} = \prod_{t=i}^{4} M_t$$

where *i* is the decennial age group to which the individual belongs at the time of the survey. The M_{iD} are presented in Appendix 4.

These intragenerational matrixes represent the probability for an individual of any decennial age group to reach a given position within a period of ten years. They reveal interesting features that deserve some comments.

For a farmer, the reconstructed probability to switch to a non-agricultural occupation within ten years decreases over the life cycle. This probability is very low all along the life cycle when the father is himself a farmer (see Figure 2). When the father is not a farmer (see Figure 3), the probability is high at the beginning of the work career, and decreases progressively. Young workers are therefore the most likely to switch from an agricultural occupation to a non-agricultural occupation, but that opportunity strongly depends on the father's occupation. For that specific social transition, the weight of origins increases over time. Intragenerational dualism is large, and few people actually bridge the gap. Ghana surely is dualistic, but the

son's intragenerational opportunities are less determined by the father's occupation than in Guinea, Côte d'Ivoire and Madagascar. In Guinea and Côte d'Ivoire, the probability seems very high that a young farmer leaves agriculture when his father himself is not a farmer.

Figure 2

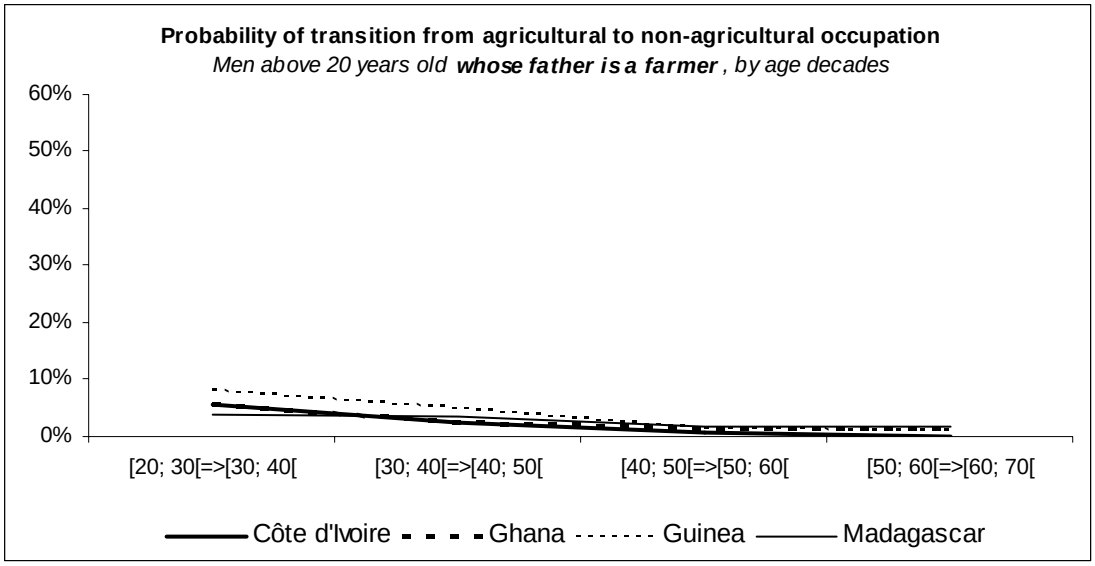
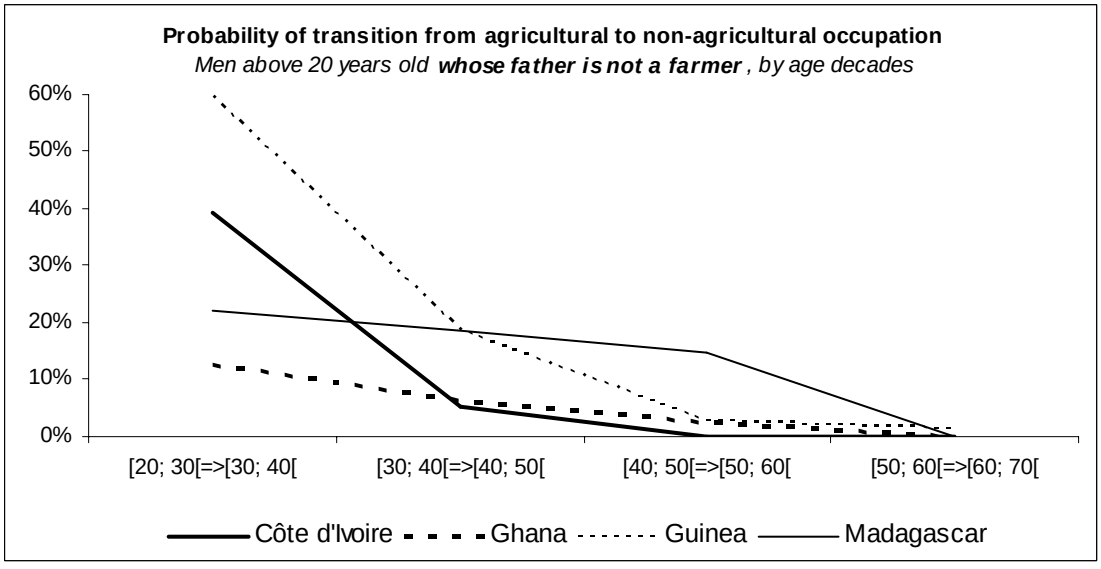


Figure 3



Let's turn to the reciprocal transitions towards agriculture. Results show that they happen more often at the beginning and at the end of the work career (Figure 4). The need to go back to one's village to inherit land or to take care of one's goods and household might explain this increasing frequency with age. Having a father farmer indeed increases the probability to come back to the same position at old ages (compare Figure 4 and Figure 5). Ghana is again the country where the father's occupation weighs the less on the son's trajectory. In

Madagascar, a large proportion of non-farmers go back to agriculture between the ages of 50 and 70 years old, with a probability ranging from 22 (father non-farmer) to 47% (father farmer).

Figure 4

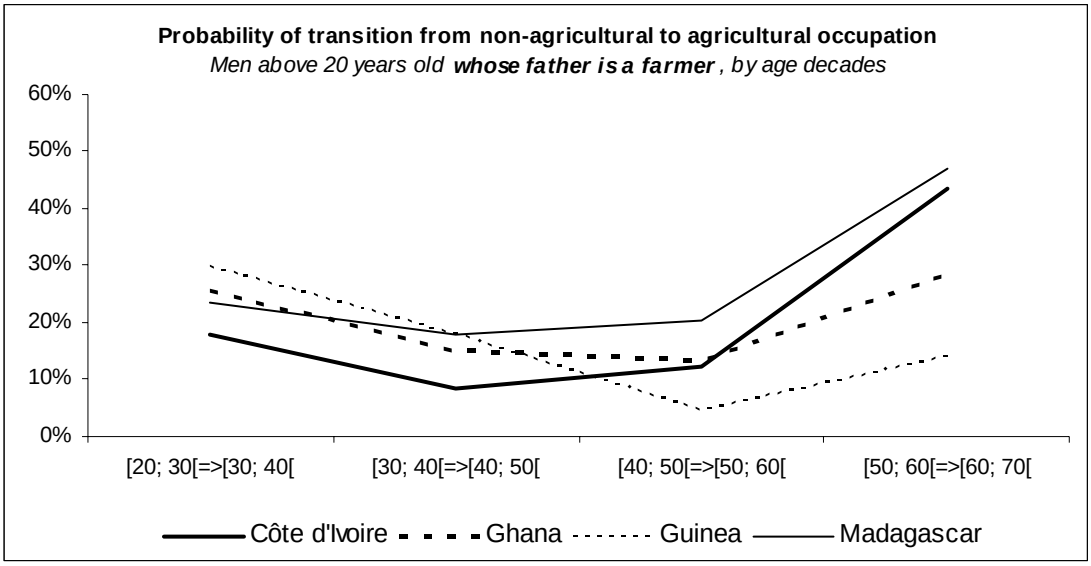
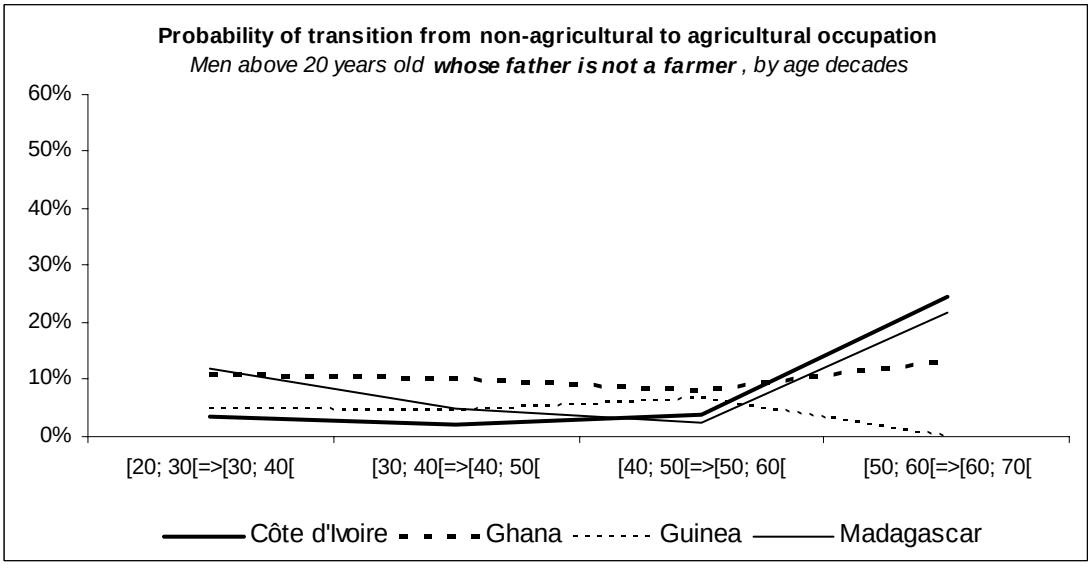


Figure 5



When the four decennial transition matrixes are cumulated, we obtain a hypothetical intragenerational matrix for the entire work career. The inequality of opportunity between individuals of different origins appears clearly (Figures 6 and 7).

Figure 6

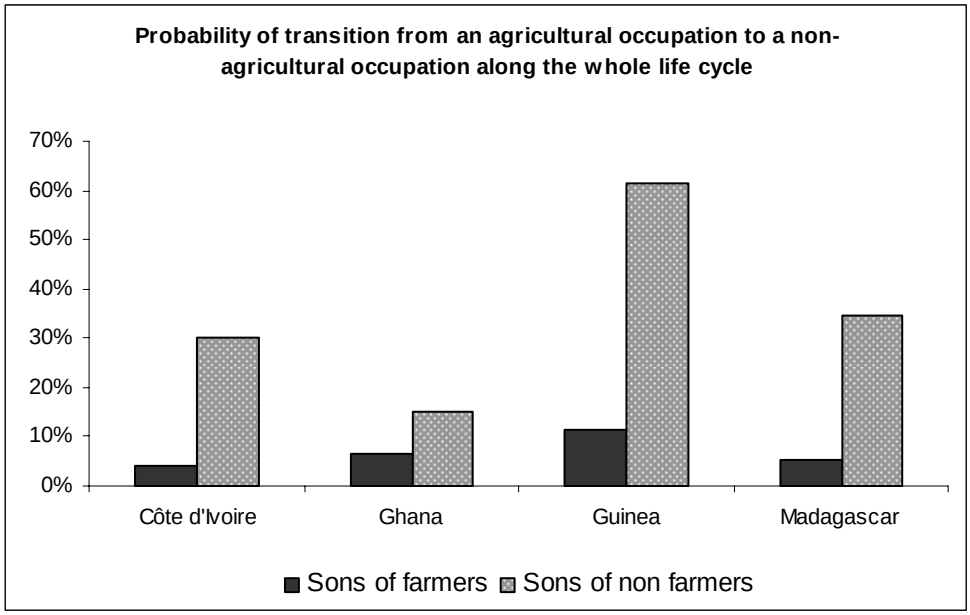
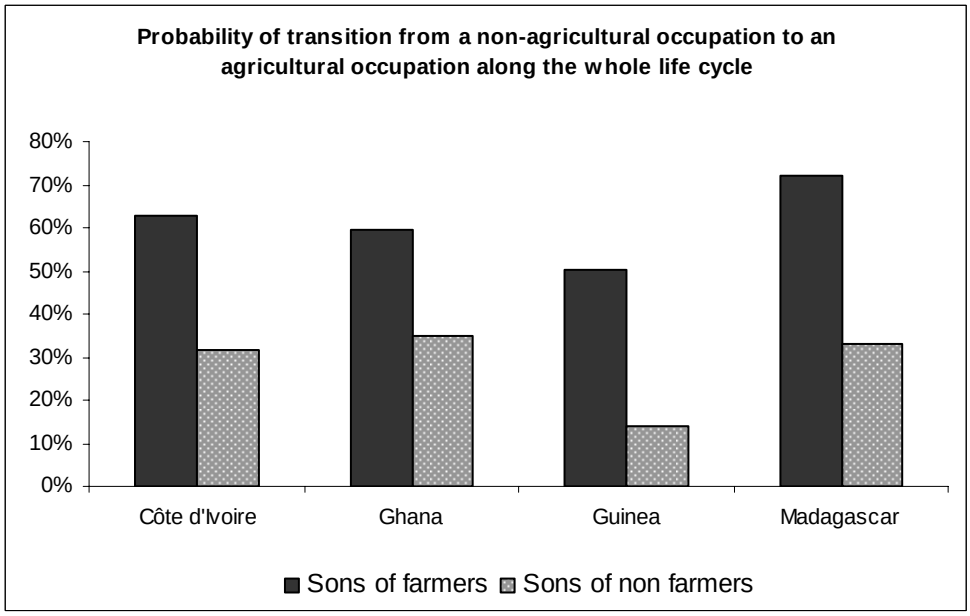


Figure 7



Concerning the access to non-agricultural occupations, the widest gap between social origins is observed in Guinea, followed by Madagascar and Côte d'Ivoire.

3.3. The impact of intragenerational mobility on intergenerational dualism

The intragenerational mobility matrixes we constructed allow correcting for the impact of occupational transitions along the life cycle upon our intergenerational dualism comparisons. Remember that the Uganda's survey did not allow us to build the same procedure.

The introduction of intragenerational mobility makes our results more reliable but does not modify them much. The ratios of uncorrected and corrected odds-ratios are most often close to 1 (see Table 4). In general the correction slightly increases the estimation of intragenerational mobility: mobility along the life cycle makes the weight of origins lower when people are observed at the age of 60-69 years. The frequency of entries into agriculture at dusk of work career explains the major part of this phenomenon.

Table 4 – Intergenerational dualism across time and impact of intragenerational mobility

	[1920; 1930[	[1930; 1940[	[1940; 1950[	[1950; 1960[	[1960; 1970[	[1960; 1970[*
Côte d'Ivoire	7,91	6,91	6,98	6,05	8,30	8,30
	1,23	**1,04**	**0,68**	**0,79**	**0,65**	**0,81**
Ghana	6,10	4,45	4,82	3,95	5,40	5,40
	1,00	**1,00**	**0,92**	**0,94**	**0,90**	**1,03**
Guinea	6,60	4,01	10,06	7,71	15,14	15,14
	1,00	**1,09**	**1,02**	**0,95**	**0,87**	**0,95**
Madagascar	8,42	18,98	14,13	17,19	16,62	16,62
	1,00	**0,82**	**0,92**	**0,81**	**0,97**	**1,05**

Reading: in Côte d'Ivoire, two men born in the 1950's whose fathers were respectively a farmer and a non-farmer are 6.05 times more likely to reproduce their father's position than to exchange them. Once corrected for intragenerational mobility according to our procedure, the odds-ratio shrinks to 0.79 times the level of the uncorrected odds-ratio.
*: This column represents the influence of taking inactivity into account: it displays the ratio of the odds-ratio that was corrected including exits from inactivity by the youngest cohort to the odds-ratio that was corrected excluding it. For example, including the possibility for young men to exit from inactivity lowers the intergenerational odds-ratio by a factor of 0.95 in Guinea

The correction is exceptionally visible in Côte d'Ivoire for the 1940-1950 cohort (0.68) and for the 1960-1970 one (0.65). First, the low level of intragenerational mobility towards the father's activity between 30 and 50 years old (see Figures 3 and 4) accounts for this result. Second, as far as the youngest cohort is concerned, the extent of the correction is linked to the exits from inactivity that we take into account. Assessing these exits lowers the observed intergenerational odds-ratio by a factor of 0.81, as shown in the last column of Table 4. The impact is lower in other countries. This comes from the specificity of not employed young men in Côte d'Ivoire (see Table 5).

Table 5 – Compared profiles of non-employed and non-agricultural workers

	Born before 1960		Born after 1960	
	Not employed	Working out of agriculture	Not employed	Working out of agriculture
% Father farmer				
Côte d'Ivoire	**69.5**	**77.1**	**57.5**	**62.6**
Ghana	57.1	62.4	36.5	42.2
Guinea	74.3	65.6	**35.2**	**53.2**
Madagascar	71.9	53.6	33.3	38.4
Uganda	72.7	66.9	64.9	58.8
Average number of years of education				
Côte d'Ivoire	**5.6**	**5.7**	**8.5**	**5.6**
Ghana	6.9	8.4	10.4	9.9
Guinea	3.1	5.1	**8.9**	**4.9**
Madagascar	5.0	8.0	10.7	8.8
Uganda	4.1	7.5	8.2	8.0

Coverage: Men aged 20-69 born between 1930 and 1970.

Younger inactive in Côte d'Ivoire and Guinea actually appear as very significantly more educated than non-agricultural workers, with a large difference of more than 3 years between the two groups. They have also much less often a father farmer in Guinea. In those two countries, most of inactive men either carry on their studies or are unemployed and queue for a skilled job. It is now well-known that the economic crisis has particularly hit the employment of young skilled men, mainly because hiring in the public sector has brutally stopped. More recent data however does show that the vast majority of these skilled unemployed did not choose to come back to the village and rather stayed in towns, either in prolonged unemployment or in the informal sector.

Correcting the results by including exits from inactivity for the youngest also decreases the odds-ratio in Guinea, but to a lesser extent than in Côte d'Ivoire, although these two countries present comparable characteristics concerning the not employed young men (Table 5). This is due to the date of the survey: in 1994, men born between 1960 and 1969 were at least 25 years old. Few people are observed in ongoing studies. The rate of inactivity for the cohort is thus much lower than in Côte d'Ivoire, and the impact of the correction appears weaker.

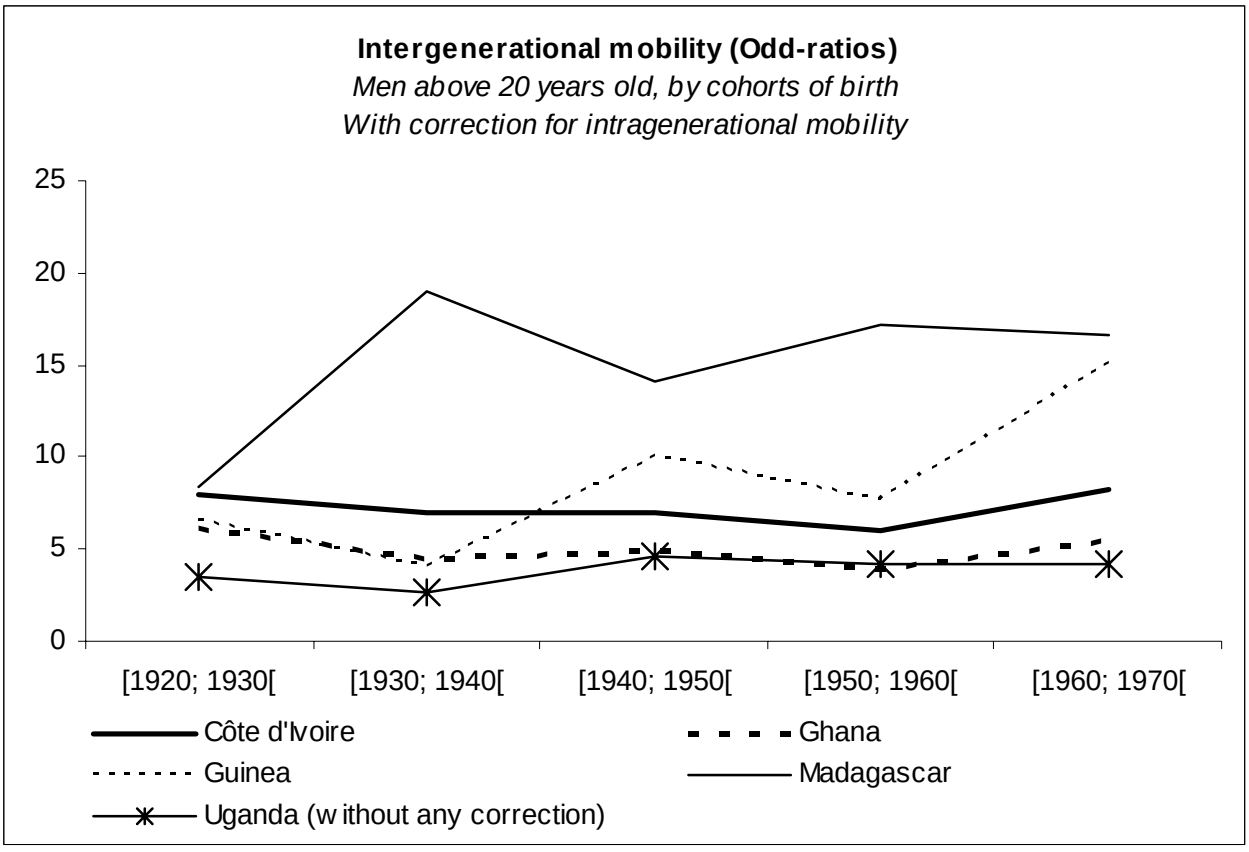
We finally obtain the following pattern of intergenerational mobility across time in our five countries:

Table 6: Intergenerational mobility across time

	[1920; 1930[	[1930; 1940[	[1940; 1950[	[1950; 1960[	[1960; 1970[
Côte d'Ivoire	7,91	6,91	6,98	6,05	8,30
	[3,21 ; 19,45]	[3,86 ; 12,37]	[4,49 ; 10,84]	[4,41 ; 8,3]	[6,38 ; 10,79]
Ghana	6,10	4,45	4,82	3,95	5,40
	[3,45 ; 10,77]	[3,05 ; 6,48]	[3,56 ; 6,51]	[3,11 ; 5,02]	[4,37 ; 6,67]
Guinea	6,60	4,01	10,06	7,71	15,14
	[1,76 ; 24,6]	[2,35 ; 6,84]	[6,23 ; 16,22]	[5,63 ; 10,55]	[11,17 ; 20,5]
Madagascar	8,42	18,98	14,13	17,19	16,62
	[2,32 ; 30,48]	[9,32 ; 38,61]	[8,36 ; 23,86]	[11,94 ; 24,72]	[11,2 ; 24,65]
Uganda*	3,44	2,62	4,59	4,23	4,19
	[1,57 ; 7,53]	[1,65 ; 4,15]	[3,35 ; 6,28]	[3,31 ; 5,38]	[3,52 ; 4,97]

Coverage: Men aged 20-69 born between 1930 and 1970.
*: series is not corrected for intragenerational mobility in Uganda, because of the lack of data.
Note: confidence intervals are calculated under the assumption that intragenerational matrixes are not stochastic.

Figure 8



5/ Educational development and educational intergenerational mobility

Before introducing education in the analysis of intergenerational dualism, we examine here the educational development experience of each country and the intergenerational mobility matrixes linking father's education and son's education.

Table 7 shows that Madagascar and Uganda developed occasional primary schooling the earliest; in Madagascar, the Merina kingdom is known to have had a schooling policy before French colonization in the late nineteenth century. Yet this advantage does give rise to a high proportion of individuals completing primary school and disappears completely at the secondary level when compared with Ghana. At the other extreme, Côte d'Ivoire and even more so, Guinea, stand out as countries where primary education was reserved to a small minority during the 1930s. These historical microeconomic statistics are in perfect keeping with the number of pupils recorded by historical statistics (Mitchell, 2001). In fact, Madagascar makes an exception among French colonies: A continental overview confirms the British colonies' advantage in terms of school extension before 1960. The computation of international databases also shows that the British advance has been maintained up to the 1990s (Cogneau, 2003), after thirty years of continued educational expansion.

Table 7 – Educational developments across time in the five countries

	Born in 1930-39	Born in 1940-49	Born in 1950-59	Born in 1960-69
% Never attended school (or never achieved any level with success)				
Côte d'Ivoire	81.3	63.1	40.1	31.7
Ghana	60.3	41.1	28.8	21.3
Guinea	93.9	85.2	62.2	52.2
Madagascar	48.5	33.5	23.3	18.0
Uganda	41.5	26.1	18.5	15.9
% Middle or secondary level				
Côte d'Ivoire	3.2	16.7	36.0	40.6
Ghana	32.0	49.7	62.3	68.4
Guinea	3.2	9.8	26.0	27.2
Madagascar	6.9	16.3	20.8	36.8
Uganda	10.3	23.6	24.3	27.4

Coverage: Men aged 20-69 born between 1930 and 1970.

Table 7 is again in line with this latter point, as the countries' ranks are unchanged when comparing the youngest cohorts educated after independence with the oldest, educated during the 1940s. The main change comes from Côte d'Ivoire which got further and further from Guinea while catching up with the other countries. While being still behind in terms of access to school in the 1970s, Côte d'Ivoire had overrun Madagascar and Uganda at the middle ("*collège*" in the French-origin systems) and secondary levels (see also Cogneau et al., 2006 for a comparison of Côte d'Ivoire with its neighbours: Burkina-Faso, Guinea and Mali). Besides, it seems that expansion of the secondary level has lagged behind in Uganda since independence in 1958.[5]

Of course, any educational expansion does not necessarily translates into higher equality of opportunity in favour of unprivileged children whose parents are poor or uneducated (see, e.g. Goux and Maurin, 1997, on the example of France; Cogneau and Gignoux, 2007 on Brazil; Pasquier-Doumer, 2004, on Peru). For our five countries, Tables 8a and 8b present some indicators of educational intergenerational mobility, in the form of odds-ratios drawn from the tables crossing the education of fathers and of sons.[6] These coefficients compare the probabilities of access to the same level of education for two sons with different educational origins (see also the note in Table 8a).

The first column of Tables 8a and 8b shows that the intergenerational educational mobility for schooling alone is low in Côte d'Ivoire and in Guinea, in keeping with the low extension of primary schooling in those two countries. The other three countries, where primary education is much more widespread, display less discrimination in access to schooling. Nevertheless, it

[5] In Ghana, middle school level is more like an upper primary level. In fact, for the generations concerned, the Ghanaian education system offered much longer schooling than elsewhere based on the "6-4-5-2" format: six years in primary school, four in middle school, five years in secondary school and two pre-university years (lower sixth and upper sixth). Individuals could pass an exam to go directly from primary to secondary school, cutting out middle school. However, since primary school had no system of repeating a failed year, half of the individuals (those who had at least reached middle school) had at least completed these six years of schooling. Most of the other half had never attended school, with only a small minority having left school at primary level. This system was reformed in 1987 and changed to the "6-3-3" format. In Madagascar and Uganda, however, two-thirds of individuals aged 20 and over had successfully completed one year of primary education, but very few had completed all five (Madagascar, "5-4-3") or seven (Uganda, "7-4-2") years of this level.

[6] Aggregate educational mobility tables are given in Appendix 5. In all that follows, the accuracy of comparisons involving Côte d'Ivoire should be taken with caution as father's education is not measured like in the other countries (by the last degree obtained rather than by the higher level attained, see Section 1 and footnote in Appendix 5).

is worth noting that Ghana does not show much more inequality from this point of view than Madagascar in older cohorts, even though primary schooling in this country was less frequent: with an odds-ratio of 13.4 at this level against 9.0 in Madagascar, Ghana was not significantly more selective, given the large overlapping of statistical confidence intervals. For younger cohort, equality of opportunity had even improved a lot more in Ghana – with an odds-ratio around 4, while staying at a very high level in Madagascar. This evolution has put Ghana at the level of Uganda. In the 1970s, the two former British colonies were showing the most advanced level of "democratisation" of access to school, although a ratio of 1 to 4 or 5 still separates the sons of educated fathers from the sons of uneducated fathers, for access to school alone. In 1992, there were still 23% of Ugandan men born before 1970 who had never been to school, and 70% of these had a father who had never attended school either.

The second column of Tables 8a and 8b presents the odds ratios observed for sons who received primary schooling and the odds of reaching "*collège*", as middle school is known in French, in the former French colonies and middle school in the former British colonies. To make the odds ratios studied more pertinent, and improve their statistical accuracy, the odds for the son of a father who went to school were compared with the odds for the son of a father who did not attend school. Similarly, the third column compares the odds of attending secondary school for the son of a father who attended at least middle school with the son of a father who did not go any further than primary school. This second series of odds ratios establishes that, in the case whereby some sort of schooling was received, Madagascar presents the most discriminating educational heritage inequalities. The influence of these inequalities carries through to both middle school and secondary school. In the other two former French colonies, where schooling is less developed, the majority of the inequality of opportunity for education is concentrated in initial schooling factors.

Lastly, the education systems in the two former British colonies are clearly less selective than the education system in former French colonies, at all levels of schooling. This latter result is strikingly in line with our previous results regarding occupational intergenerational mobility.[7]

[7] A deeper analysis of educational mobility matrixes with the log-linear model confirms those country rankings and evolutions (see, Hiller, 2005).

Table 8a – Educational intergenerational mobility: odds-ratios for cohorts born before 1960

	Unschooled / Schooled	At least primary / At least middle school*	At least middle school / At least secondary school**
Côte d'Ivoire	**30.4**	**6.2**	3.3
	[14.8; 62.6]	**[3.7; 10.4]**	[1.8; 6.4]
Ghana	13.4	2.8	2.7
	[9.4; 19.2]	[1.9; 4.1]	[2.1; 3.5]
Guinea	**25.3**	3.5	3.3
	[16.2; 39.4]	[2.1; 5.7]	[1.6; 7.1]
Madagascar	9.3	**5.7**	3.9
	[7.1; 12.1]	**[4.2; 7.7]**	[2.7; 5.7]
Uganda	5.2	3.3	1.7
	[4.1; 6.6]	[2.8; 3.9]	[1.2; 2.4]

Coverage: Men aged 20-69 born between 1930 and 1970 and whose father's education is known.
Confidence intervals at 5% between brackets
*: The coverage is limited to sons who attended school and the father's education is coded one level below: unschooled/schooled. The fathers' and sons' positions are therefore not symmetrical.
**: The coverage is limited to sons who attended middle school or secondary school and the father's education is coded one level below: unschooled or at least primary/middle school. The fathers' and sons' positions are therefore not symmetrical.
Interpretation: In Côte d'Ivoire, an individual whose father never went to school and an individual whose father attended school have nearly a 50% higher probability of reproducing their father's position than of changing it. Among the individuals who received schooling, an individual whose father never attended school is over four times more likely to go no further than primary school and an individual whose father attended school is over four times more likely to attend at least middle school, compared with the alternative. Among the individuals who attended middle school, an individual whose father did not go further than primary school is more than twice as likely to go no further than primary school and an individual whose father attended middle school is over twice as likely to go at least to secondary school, compared with the alternative.

Table 8b – Educational intergenerational mobility: odds-ratios for cohorts born after 1960

	Unschooled / Schooled	At least primary / At least middle school*	At least middle school / At least secondary school**
Côte d'Ivoire	**33.1**	2.2	1.5
	[10.5; 104.4]	[1.5; 3.2]	[0.9; 2.4]
Ghana	4.4	3.1	2.5
	[3.2; 5.9]	[2.1; 4.4]	[1.9 ; 3.2]
Guinea	**20.4**	2.8	1.6
	[12.6; 32.9]	[1.9; 4.1]	[1.1; 2.3]
Madagascar	**11.9**	3.1	**4.2**
	[7.9; 17.9]	[2.3; 4.1]	**[2.9; 6.1]**
Uganda	4.6	3.2	1.7
	[3.6; 5.7]	[2.6; 3.8]	[1.3; 2.2]

Coverage: Men aged 20-69 born between 1930 and 1970 and whose father's education is known.
Confidence intervals at 5% between brackets
Notes: see table 8a above

6/ Intergenerational dualism: interactions with education and region of birth

This last section confronts our main results regarding intergenerational dualism (section 3) with the educational developments that have just been examined in the previous section.
We estimate logit models in which the individuals' education level enter as another explanatory variable for the individuals' occupation, aside with the "father farmer" variable. We additionally introduce another potential correlate of occupation: the region of birth of the individual.

This last variable is of outmost importance in the African context of State consolidation and ethnic conflicts. We distinguish individuals born in the Northern part of Côte d'Ivoire, Ghana and Guinea, and in the costal regions of Madagascar (as opposed to highlands in the centre of the country). Since 2002, Côte d'Ivoire is plagued by a civil war which induced a partition of the country between North and South. Northern Ghana carries on being discriminated against in public expenditures allocation, in particular in terms of education and health (Shepherd and Gyimah-Boadi, 2005).[8] This kind of regional inequalities can be traced back to pre-colonial and colonial times: they involve the domination of pre-colonial kingdoms on peripheral regions (Asante and Merina kingdoms in Ghana and Madagascar) and the long-lasting impact of the European intrusion and of colonial powers' policies (see Huillery, 2006, for an investigation of the historical origins of spatial inequalities within the former French West Africa; see Shepherd and Gyimah-Boadi, 2005, on Ghana). Unfortunately, region of birth is not available in the Ugandan survey, where we would have also liked to make a distinction between Northerners and Southerners.[9]

Table 9 presents the estimation results of two models for each country and two cohorts (born before or after 1960). Both models explain the probability of working in agriculture as main occupation. In the left part of the table (Model I), the "father farmer" dummy is introduced alone, while in the right part (Model II) education and region of birth are added.
Model I purely reproduces the "uncorrected" occupational odds-ratios described in section 3, excepting the fact that the cohorts born before 1960 are now aggregated into a single one.

[8] For cohorts born before 1960 as well as for cohorts born after 1960, a huge average difference of 6 years of education separates Ghanaian Southerners from Ghanaian Northerners, among men aged 20-69.

[9] In Northern Uganda, a rebellion based in Sudan has been fighting the central government led by Yoweri Museveni since twenty years.

Results plainly confirm the countries' rankings obtained here above, as well as the large increase of intergenerational dualism in Guinea.

Table 9 – Intergenerational dualism and correlates: logit models for working in agriculture

	Model I					Model II				
	Born before 1960		Born after 1960		Change	Born before 1960		Born after 1960		Change
	Odds-ratio	Rank	Odds-ratio	Rank		Odds-ratio	Rank	Odds-ratio	Rank	
Father farmer										
Côte d'Iv.	8.48	2	14.13	3		6.00	3	14.08	3	++
Ghana	4.52	1	5.95	2		3.74	1	5.08	1	+
Guinea	7.12	2	17.55	3	++	4.69	2	11.52	3	++
Madagascar	20.25	3	17.72	3		8.58	3	11.29	3	
Uganda	3.91	1	4.15	1		2.76	1	3.21	1	
Primary level										
Côte d'Iv.						0.64	1	0.51	2	
Ghana						0.75	1	0.99	1	
Guinea						0.32	2	0.37	3	
Madagascar						0.18	3	0.32	3	
Uganda						0.48	2	0.49	2	
Middle or Secondary level										
Côte d'Iv.						0.30	1	0.06	3	++
Ghana						0.35	1	0.32	1	
Guinea						0.20	1	0.07	2	++
Madagascar						0.08	2	0.04	3	
Uganda						0.11	3	0.10	3	
Region of birth										
N. C.d'Iv.						1.43		1.42		
N. Ghana						1.23		1.39		
N. Guinea						4.76		2.89		-
Coast Mad.						2.33		1.30		-
N	21961									
Log. Likelihood	-12596					-11329				
Pseudo-R^2	0.12					0.21				

Coverage: Men aged 20-69 born between 1930 and 1970 and whose occupation is known (employed).
Unless noticed, all odds-ratios are significantly different from one at 5%
( ): not significantly different from one at 5%
++, +, - or -- : significant change at 5%

Model II significantly improves Model I in terms of likelihood, by introducing education and region of birth as additional correlates of working in agriculture. When the impact of father being a farmer on the individual's education is cancelled out, the coefficient of the father farmer dummy is significantly diminished in the cases of Guinea and Madagascar. In other cases, it roughly stays the same. For the 1960-70 cohort, the tightening of intergenerational dualism in Côte d'Ivoire is even reinforced and more significant.

As expected, the influence of education on occupational selection is large. For cohorts born before 1960, the two countries where education determines the most entries and exits from agriculture are Madagascar and Uganda, where primary education was the most widespread. Ghana stands out as the country where education has the less influence. For generations born after 1960 and 1970, the selective power of education strongly increases in Côte d'Ivoire and Guinea, the same countries where the impact of a father farmer also dampens. In contrast, Ghana maintains its rank as the less selective country. Finally and consistently, the three former French colonies come out not only as the countries where intergenerational dualism is the hardest, but also where the educational barriers of entry in the non-agricultural sector are the highest.

Region of birth also shows a significant influence: in peripheral regions remote from the capital town, exits from agriculture are less frequent. In Guinea and Madagascar however, time has brought about a decrease in this influence of the region of origin, maybe thanks to infrastructure improvements.

Table 10 tentatively applies the same two logit models to explaining the entry into the higher "*salariat"* or white collar jobs, conditionally to being out of the agricultural sector. Estimation results show that the father farmer dummy plays a negligible role in the occupation selection outside of agriculture, and even less so when education is controlled for (Model II). Model II estimates show that middle or high school education is the required passport to enter this domain of skilled, protected and relatively well-paid jobs. The strength of this prerequisite has again strongly increased in Côte d'Ivoire and Guinea for generations born after 1960 and having entered the labour market during the 1980s. The three former French colonies again come out as the countries where education is the most selective, this time at the secondary level. In Côte d'Ivoire, Ghana and Madagascar, being born in a peripheral region of birth here compensates for lack of education: especially in the public sector, regional or ethnic balance calls for some affirmative action in favour of individuals coming from the unprivileged parts of the country.

Table 10 – Intergenerational dualism and correlates: logit models for being a "white collar"

	Model I					Model II				
	Born before 1960		Born after 1960		Change	Born before 1960		Born after 1960		Change
	Odds-ratio	Rank	Odds-ratio	Rank		Odds-ratio	Rank	Odds-ratio	Rank	
Father farmer										
Côte d'Iv.	0.71	3	(1.2)	1		(1.1)	1	(1.2)	1	
Ghana	(1.2)	1	(1.0)	1		(1.2)	1	(1.0)	1	
Guinea	0.57	3	(0.8)	1		(1.2)	1	(1.1)	1	
Madagascar	(0.9)	1	(0.7)	1		(1.5)	1	(1.0)	1	
Uganda	(1.3)	1	(0.9)	1		1.61	1	(1.2)	1	
Primary level of education										
Côte d'Iv.						(2.0)	1	2.49	3	
Ghana						(0.5)	1	(0.6)	1	
Guinea						(1.0)	1	(1.3)	2	
						(2.0)	1	(1.7)	2	
Madagascar										
Uganda						(1.6)	1	(1.0)	1	
Middle or Secondary level of education										
Côte d'Iv.						8.56	3	36.28	3	++
Ghana						2.12	1	4.22	1	
Guinea						4.39	2	16.29	2	++
Madagascar						(5.5)	2	8.69	2	
Uganda						7.11	3	3.94	1	
Region of birth										
N. C.d'Iv.						(1.2)		1.64		
N. Ghana						(1.9)		1.74		
N. Guinea						(0.6)		(1.0)		
Coast Mad.						(0.8)		1.64		
N	10214									
Log. Likelihood	-6430					-5522				
Pseudo-R^2	0.04					0.17				

Coverage: Men aged 20-69 born between 1930 and 1970, whose occupation is known (employed) and is not in agriculture.
( ): not significantly different from one at 5%
++, +, - or -- : significant change at 5%

7/ Conclusion

This paper sets down a first comparative measurement of the features and of the evolution across time of the intergenerational mobility of men in five countries of Sub-Saharan Africa. It focuses on intergenerational entries into and exists from agriculture, which is most important in countries where more than half of the population still today works in farms. Intragenerational entries and exits flows are also considered, as well as the link with educational developments and educational intergenerational mobility.

The comparison establishes a large divide between two groups of countries, whether in terms of occupational or educational mobility.

The two former British colonies, Ghana and Uganda, stand out by far with the lowest degree of intergenerational dualism. In those two countries, the education system seems less selective; the sorting power of education on the labour market is also more limited, especially in Ghana.

In contrast, in the three former French colonies, the opportunity structure of the society seems much less opened in all respects.

As Table 11 shows, Brazil, a country well-known for his record in inequality, and China, where labour migration is still strictly regulated, stand in-between those two groups.

Table 11 – Out of Africa: The five countries compared with Brazil, China and India

	Odds-ratio
Uganda 1992	4.2
Ghana 1988-92	4.8
Brazil 1996	**8.0**
China 1996	**8.6**
Côte d'Ivoire 1985-88	9.3
Guinea 1994	10.0
Madagascar 1993	16.9
India 1996	**32.4**

Coverage: Men aged 20-69, except for India: representative sample of male electorate.
Sources: Brazil: authors' computation from PNAD 1996 survey (see also Cogneau and Gignoux, 2006); China: authors' computation from Table 3 in Wu and Treiman 2006; India: authors' computation from Tables 2 and 3 in Kumar, Heath and Heath, 2002a and 2002b.

This large divide can be related to long-term historical developments. While in former British colonies intergenerational dualism seems to have remained stable throughout the colonial and post-colonial eras, it has strongly increased in Côte d'Ivoire and Guinea after the countries' independence. In contrast, Madagascar exhibits a high and long-lasting social rigidity which can probably be traced back to pre-colonial times, and partly attributed to the caste structure of this society, like in India which stands out in Table 11 as the world record of intergenerational dualism.

Intergenerational dualism and educational reproduction have strong consequences in terms of distributive justice. The social rigidity of the three former French colonies also translates in higher inequality of opportunity for income and living standards, and goes together with high cross-sectional inequalities in welfare (Cogneau et al., 2006).[10]

Further research is warranted to understand the sources of such a big divergence between the two groups of countries. Differences in modernisation and economic development give no clue: Côte d'Ivoire and Ghana are the most developed countries. The length of the socialist period gives no clue either: Guinea has been the most socialist country and Côte d'Ivoire the most economically liberal. The process of State construction and consolidation is probably a better track, when connected with economic dualism and the status of education. On one side, like all British colonies on average, Ghana and Uganda have benefited from higher educational investments during the colonial period, and have inherited a more decentralized State structure and a more competitive political field. On the other side, francophone States' policies have set high levels of income dualism and monetary returns to education, regardless of their respective level of industrial and educational development, and following the interests of the small educated class.

Obviously, putting together the pieces of the puzzle requires a better understanding of the interaction between pre-colonial conditions, colonial powers' policies and consecutive or disruptive post-colonial State trajectories.

[10] It has also probable consequences in the political field, through a less opened access to "voice" and a higher social reproduction of elites. The early extension of political voice and of elite competition in the two former British colonies could have been at the expense of post-colonial political stability. See also Cogneau, 2006.

References

Behrman J.R., A. Gaviria and M. Székely, 2004. Intergenerational Mobility in Latin America *Economia*, 2(1): 1-43.

Bourguignon F., F. Ferreira and M. Menendez, 2005. Inequality of Opportunity in Brazil, Ibero-America Institute for Economic Research, Discussion Paper No. 133, University of Göttingen, 45 pp.

Cheng Y. and J. Dai J, 1995. Intergenerational Mobility in Modern China, *European Sociological Review*, 11(1):17-35.

Cogneau D., 2003. Colonisation, School and Development in Africa – An Empirical Analysis, *DIAL* Working paper DIAL, DT 2003/01.

Cogneau D., 2006. *L'Afrique des inégalités: où conduit l'histoire*. Opuscule CEPREMAP n°4, Paris : Editions de l'Ecole Normale Supérieure.

Cogneau D., T. Bossuroy, P. De Vreyer, C. Guénard, V. Hiller, P. Leite, S. Mesplé-Somps, L. Pasquier-Doumer, and C. Torelli, 2006. Inequality and Equity in Africa, Working paper DIAL DT 2006/11 and AFD Notes et Documents 31.

Cogneau D. and Gignoux J., 2007. Earnings Inequalities and Educational Mobility in Brazil over Two Decades, forthcoming in Klasen S. (ed.), *Poverty, Inequality and Policy in Latin America*, CESifo Series, Harvard, Mass.: MIT Press.

Dunn C., 2003. Intergenerational Earnings Mobility in Brazil and its Determinants, Working Paper, University of Michigan.

Erikson R. and J. Goldthorpe, 1992. *The Constant Flux: A Study of Class Mobility in Industrial Societies*, Oxford: Clarendon Press.

Ganzeboom H. B. G., R. Liujkx and D. J. Treiman, 1989. International Class Mobility in Comparative Perspective, *Research in Social Stratification and Mobility*, 8: 3-84.

Goldthorpe J., 1985. On Economic Development and Social Mobility, The *British Journal of Sociology*, 36(4): 549-573.

Goux D. and E. Maurin, 1997. Meritocracy and Social Heredity in France: Some Aspects and Trends, *European Sociological Review*, 13(2): 159-178.

Grusky D. B. and R.M. Hauser, 1984. Gaps Comparative Social Mobility Revisited: Models of Convergence and Divergence in 16 Countries, *American Sociological Review*, 49(1): 19-38.

Hiller V., 2005. Comparaisons de mobilité intergénérationnelle, rapport de stage ENSAE, mimeo, 52 pp.

Huillery E., 2006. Colonisation and Development in the Former West Africa: the Long-Term Impact of the Colonial Public Policy, Working Paper DIAL, 2006/12.

Kumar S., A. Heath and O. Heath, 2002a. Determinants of Social Mobility in India, *Economic and Political Weekly*, July 20.

Kumar S., A. Heath and O. Heath, 2002b. Changing Patterns of Social Mobility, Some Trends Over Time, *Economic and Political Weekly*, October 5.

Lam D., 1999. Generating Extreme Inequality: Schooling, Earnings and Intergenerational Transmission of Human Capital in South Africa and Brazil, Research Report, Population Studies Center, University of Michigan.

Louw M., S. Van Der Berg and D. Yu, 2006. Educational Attainment and Intergenerational Social Mobility in South Africa, Stellenbosch Economic Working Paper 09/06.

Mitchell B.R., 2001, International Historical Statistics, 1750-1993: Africa, Asia, Oceania, Mac Millan Reference Ltd.

Pasquier-Doumer L., 2004. Vers plus d'opportunités scolaires ? Evolution de la mobilité scolaire intergénérationnelle au Pérou depuis un siècle, *Revue d'Economie du Développement*, 2004/1 : 101-135.

Pastore J., 1982. *Inequality and Social Mobility in Brazil*, Chicago: University of Wisconsin Press.

Pastore J. and Valle Silva N., 2000. Mobilidade Social no Brasil, Makron, Sao Paulo.

Picanço F., 2004. Economic Modernization and Socio-Occupational Mobility in Brazil, Communication at the International Sociological Association, RC28, 21 pp.

Shepherd A. and E. Gyimah-Boadi, 2005. Bridging the north-south divide in Ghana? Background paper for the 2005 World Development Report, mimeo, World Bank, Washington DC.

Tyree A., M. Semyonov and R.W. Hodge, 1979. Gaps and Glissandos: Inequality, Economic Development and Social Mobility in 24 countries, *American Sociological Review*, 44(3): 410-424.

Wu X. and D. J. Treiman, 2006. Inequality and Equality Under Socialism: Occupational Mobility in Contemporary China, California Center for Population Resaerch, On-Line Working Paper Series, CCPR-09-06.

Appendix 1: Description of the surveys used

The surveys used in this paper were based on the World Bank's methodology for the comprehensive LSMS surveys. They were conducted by the national statistics institutes with the assistance of this institution. They cover a wide range of subjects including education, health, housing, employment, migration, income and consumption. They constitute rare examples of this type of survey in Africa and include information on the parents of the respondents, giving rise to a measurement and analysis of intergenerational mobility.

Côte d'Ivoire

The data come from the four *Enquêtes Permanentes auprès des Ménages* (EPAM) conducted by the Côte d'Ivoire National Institute of Statistics (INS). The first survey (1985) was fielded from February 1985 to January 1986, the second (1986) was carried out from February 1986 to January 1987, the third (1987) was conducted from March 1987 to February 1988, and the fourth (1988) from May 1988 to April 1989. These four surveys were stacked to obtain a database of 3,964 households. As regards the first three years, half of the sample was again interviewed the following year in the form of a panel. We kept only the most recent information on the panel households, such that the final sample contains approximately 800 households observed in 1985, 800 in 1986, 800 in 1987 and 1,600 in 1988.

Ghana

The first wave of the *Ghana Living Standards Survey* (GLSS1) was conducted by the Ghana Statistical Service (GSS) from September 1987 to July 1988. The database obtained covers around 3,000 households. The third wave of the *Ghana Living Standards Survey* (GLSS3) was conducted by the Ghana Statistical Service (GSS) from September 1991 to September 1992. The database obtained covers around 4,500 households.

Guinea

The *Enquête Intégrale Budget et Consommation* (EIBC) was carried out by the Republic of Guinea's National Statistics Directorate (DNS) from January 1994 to February 1995. The database obtained comprises around 4,500 households.

Madagascar

The *Enquête Permanente auprès des Ménages* (EPM) was fielded by the National Institute of Statistics (INSTAT) from April 1993 to April 1994. The database obtained contains 4,500 households.

Uganda

The *Uganda National Integrated Household Survey* (IHS) was conducted by the Statistics Department of the Ministry of Finance and Economic Planning from March 1992 to March 1993. The database obtained covers around 9,800 households.

Appendix 2: Political regimes and economic development in the five countries

The Socialist experiences during the post-independence eras.

	1960	1970	1980	1990
Côte Ivoire (60)	Liberal (P)			
Ghana (57)	Social.(A) Lib.(P)	Military(A)	Military (P)	
Guinea (58)	Socialism (A)		Military (P)	
Madagascar(60)	Liberal (P)	Socialism (A)		
Uganda (62)	Socialism (A)	Military (A)	Instability	

Reading: Ivory Coast never experienced socialism. It only experienced (P=Pro-western) liberalism. Guinea experienced (A=Anti-western) socialism until the mid-eighties and the death of Sekou Toure. The number between parenthesis is the date of independence: Madagascar became independent in 1960.

Development indicators

	1985-88 Côte d'Ivoire	**1988 Ghana**	**1994 Guinea**	**1993 Madagascar**	**1992 Uganda**
Population	10	14	6	12	12
Population density	31	59	17	20	75
GDP per capita in international $	1724*	1035	514	709	574
Gini index (income inequality)	0.56	0.46	0.59	0.53	0.49

Source: World Development Indicators 2006 for population; Maddison (2003) for GDP per capita in Purchasing Power Parity. Own estimates from surveys for the Gini index: see Cogneau et al. (2006).
**: 4 years average*

Appendix 3: Outflow tables of intergenerational occupational mobility

Côte d'Ivoire

Father's occupation	Son's occupation: Agricultural	Non-Agricultural	
Agricultural	2554	1205	3759
	67,9	32,1	100,0
	96,4	73,5	87,6
Non-Agricultural	96	435	531
	18,17	81,83	100
	3,64	26,5	12,38
Total	2650	1640	4290
	61,8	38,2	100,0
	100,0	100,0	100,0

Madagascar

Father's occupation	Son's occupation: Agricultural	Non-Agricultural	
Agricultural	2634	414	3048
	86,4	13,6	100,0
	93,9	47,6	82,9
Non-Agricultural	172	456	628
	27,4	72,6	100,0
	6,1	52,4	17,1
Total	2806	870	3676
	76,3	23,7	100,0
	100,0	100,0	100,0

Ghana

Father's occupation	Son's occupation: Agricultural	Non-Agricultural	
Agricultural	2845	1238	4083
	69,7	30,3	100,0
	86,0	55,9	73,9
Non-Agricultural	464	977	1441
	32,2	67,8	100,0
	14,0	44,1	26,1
Total	3309	2215	5524
	59,9	40,1	100,0
	100,0	100,0	100,0

Uganda

Father's occupation	Son's occupation: Agricultural	Non-Agricultural	
Agricultural	4247	1363	5609
	75,7	24,3	100,0
	87,4	62,2	79,6
Non-Agricultural	610	830	1440
	42,4	57,6	100,0
	12,6	37,9	20,4
Total	4857	2192	7049
	68,9	31,1	100,0
	100,0	100,0	100,0

Guinea

Father's occupation	Son's occupation: Agricultural	Non-Agricultural	
Agricultural	2352	897	3249
	72,4	27,6	100,0
	93,9	61,8	82,1
Non-Agricultural	153	554	707
	21,6	78,4	100,0
	6,1	38,2	17,9
Total	2505	1451	3956
	63,3	36,7	100,0
	100,0	100,0	100,0

Coverage: Men aged 20-69 born between 1930 and 1970, whose occupation is known (employed)

Appendix 4: Reconstructed tables of intragenerational occupational mobility

Côte d'Ivoire

[20-30[=> [30-40[

	Father A		Father NA	
	A	NA	A	NA
A	99%	1%	100%	0%
NA	3%	97%	1%	99%

[30-40[=> [40-50[

	Father A		Father NA	
	A	NA	A	NA
A	99%	1%	100%	0%
NA	1%	99%	0%	100%

[40-50[=> [50-60[

	Father A		Father NA	
	A	NA	A	NA
A	100%	0%	100%	0%
NA	2%	98%	0%	100%

[50-60[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	100%	0%	100%	0%
NA	16%	84%	0%	100%

Cumulated for the entire work career

[20-30[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	98%	2%	100%	0%
NA	21%	79%	1%	99%

Ghana

[20-30[=> [30-40[

	Father A		Father NA	
	A	NA	A	NA
A	94%	6%	88%	13%
NA	26%	74%	11%	89%

[30-40[=> [40-50[

	Father A		Father NA	
	A	NA	A	NA
A	97%	3%	94%	6%
NA	15%	85%	10%	90%

[40-50[=> [50-60[

	Father A		Father NA	
	A	NA	A	NA
A	99%	2%	98%	2%
NA	14%	87%	8%	92%

[50-60[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	99%	1%	100%	0%
NA	28%	72%	13%	87%

Cumulated for the entire work career

[20-30[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	93%	7%	85%	15%
NA	60%	40%	35%	65%

Guinea

[20-30[=> [30-40[

	Father A		Father NA	
	A	NA	A	NA
A	92%	8%	40%	60%
NA	29%	71%	7%	93%

[30-40[=> [40-50[

	Father A		Father NA	
	A	NA	A	NA
A	95%	5%	82%	18%
NA	19%	82%	4%	96%

[40-50[=> [50-60[

	Father A		Father NA	
	A	NA	A	NA
A	99%	1%	97%	3%
NA	5%	95%	6%	94%

[50-60[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	99%	1%	99%	2%
NA	14%	86%	0%	100%

Cumulated for the entire work career

[20-30[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	89%	11%	38%	62%
NA	51%	49%	14%	86%

Madagascar

[20-30[=> [30-40[

	Father A		Father NA	
	A	NA	A	NA
A	96%	4%	78%	22%
NA	24%	76%	12%	88%

[30-40[=> [40-50[

	Father A		Father NA	
	A	NA	A	NA
A	96%	4%	81%	19%
NA	18%	82%	5%	95%

[40-50[=> [50-60[

	Father A		Father NA	
	A	NA	A	NA
A	98%	2%	85%	15%
NA	21%	79%	3%	97%

[50-60[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	98%	2%	100%	0%
NA	47%	53%	22%	78%

Cumulated for the entire work career

[20-30[=> [60-70[

	Father A		Father NA	
	A	NA	A	NA
A	95%	5%	66%	34%
NA	72%	28%	33%	67%

Appendix 5: Matrices of intergenerational educational mobility

Côte d'Ivoire

	0	1	2	total
0	3032.07 62.65%	930.81 19.23%	876.53 18.11%	4839.42 100%
1	7.59 5.05%	33.79 22.46%	109.1 72.5%	150.49 100%
2	1.72 2.6%	8.56 12.95%	55.52 84.46%	66.09 100%
total	3041.39 60.15%	973.16 19.25%	1041.45 20.6%	5056 100%

Ghana

	0	1	2	total
0	2370 47,42%	486 9,72%	2142 42,86%	4998 100%
1	33 11,70%	21 7,45%	220 80,85%	244,52 100%
2	65 6,57%	60 6,06%	865 87,37%	244,52 100%
total	2468 39,36%	567 9,04%	3235 51,59%	6270 100%

Guinée

	0	1	2	total
0	4001,54 76,58%	477,79 9,14%	745,71 14,27%	5225,04 100%
1	23,35 17,67%	30,4 23%	78,41 59,33%	132,17 100%
2	18,67 9,03%	31,06 15,02%	157,05 75,95%	206,79 100%
total	4043,56 72,67%	539,26 9,69%	981,18 17,63%	5564 100%

Madagascar

	0	1	2	total
0	944,29 47,55%	893,4 44,98%	148,38 7,47%	1986,08 100%
1	162,92 9,71%	995,29 59,33%	519,41 30,96%	1677,62 100%
2	7,11 1,95%	71,44 19,56%	286,76 78,5%	365,31 100%
total	1114,31 27,66%	1960,13 48,65%	954,56 23,69%	4029 100%

Ouganda

	0	1	2	total
0	1624,24 35,03%	2472,57 53,33%	539,67 11,64%	4636,48 100%
1	201,42 8,26%	1481,48 60,73%	756,53 31,01%	2439,43 100%
2	30,63 3,46%	306,78 34,66%	547,69 61,88%	244,52 100%
total	1856,28 23,32%	4260,83 53,52%	1843,88 23,16%	7961 100%

Rows: Father's education
Columns: Son's education

0: Did not attend school*

1: Attended primary school*

2: Attended secondary school*

Coverage: Men aged 20 and over whose father's occupation is known.

*: To be more precise, the last year successfully completed was at this level. In the case of Côte d'Ivoire, only the last qualification obtained is known for the fathers. We therefore had to code as 0 the fathers who had not passed the basic exam sat at the end of primary education, as 1 those who had passed it, as 2 those who had passed the school certificate at middle school, and 3 those with the *baccalauréat* or a higher qualification. Technical qualifications were coded as 2. This classification underestimates the level of education of fathers from Côte d'Ivoire compared with the other countries and also compared with their sons.