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Poverty and Inequality in Algeria**

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## **ABSTRACT**

### **“To Have and Have Not”: Migration, Remittances, Poverty and Inequality in Algeria**

This article analyses the distributional impact of remittances across two regions of Algerian emigration (Nedroma and Idjeur) using an original survey we conducted of 1,200 households in 2011. Remittances and especially the role played by foreign pensions decrease the Gini index by nearly 4 % for the two Algerian regions, with the effect in Idjeur being twice as large as Nedroma. At the same time, they help reduce poverty by nearly 13 percentage points. Remittances have a strong positive impact on very poor families in Idjeur but much less in Nedroma, where poor families suffer from a “double loss” due to the absence of their migrants and the fact that the latter do not send money home.

JEL Classification: F24, O15, O55

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# 1. Introduction

Migrants from poor countries seek to improve their living conditions and those of their families. Many of them send some of the money they earn in the host country to their families in their home country. These remittances are quantitatively very important: in 2012, remittances to developing countries amounted to \$401 billion<sup>1</sup>. Remittances are far higher than official development assistance to Asia, Latin America or the Middle East and North Africa. Remittances are also a type of external income which is directly paid to households. They have a very important impact on recipient families' welfare in countries still mired in poverty.

The scale of the sums involved has recently revived the literature on the impact these transfers have on migrants' countries of origin. The issues examined are many, but one question which is especially analysed and debated concerns the impact of such transfers on poverty and the distribution of income in countries of origin. The literature has addressed this subject for several years and seeks to know if the money, which is paid directly to households, allows families to exit poverty and/or reduce inequality.

The studies already conducted show that the impact is consistent with a reduction in poverty, but differs according to recipient countries as far as inequality is concerned. Remittances tend to reduce inequality in the poorest countries, but have a different impact on middle income countries. It is therefore relevant to re-situate the effects of remittances in their context and the history of migrations. By cutting the costs of migration, thanks to the constitution of networks and the dissemination of information, migration and subsequent remittances do help reduce inequality by allowing the poorest households to send migrants abroad or to other towns. McKenzie and Rapoport (2007) show, both theoretically and empirically, that wealth has a nonlinear effect on migration and examine the empirical evidence for an inverse U-

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<sup>1</sup> World Bank, Migration and Development Brief, 20, April 2013.

shaped relationship between emigration and inequality. At the first stage of emigration, only rich families can send migrants abroad because of their ability to face high migration costs. The result is an increase in inequality as they are the households who receive money from abroad. In a second stage, inequality tends to decrease because the presence of a much larger diaspora reduces migration costs for the poorer households, who can now afford to send migrants and can receive money as a result. In the last stage inequality decreases.

This article seeks to look at the effects of emigration on poverty and inequality drawing an original survey conducted in Algeria. It is the first household survey in Algeria addressing the issue of impact of remittances on poverty and inequality. The officially recorded remittances received by Algeria are much less than in other countries, as in 2010 they only represented 1% of GDP (\$2 billion)<sup>2</sup>. This compares with an average for the MENA region of 3.1% of GDP. But, informal remittances on the black market exchange rate are much higher. According to some estimates more than 90 % of remittances received in Algeria are informal. This suggests that using household level data with direct measures of remittances received is more likely to give an accurate picture than relying on official data on remittances.

Algerian emigration is largely concentrated in the former colonial country. In 2010, some 1.211 million Algerian immigrants<sup>3</sup> (excluding illegal immigrants) accounted for 3.4% of its population, with 96 % of them being identified as living in France. The history of migration between Algeria and France has led to the emergence of an important and diversified diaspora, comprising migrants of all ages and all socio-professional categories. Kabylia (more precisely in the commune of Idjeur) in the North-East and Tlemcen (more precisely the commune of Nedroma) in the North-West are the two regions we investigate in this paper. They both have a high expatriation rate and are similar in terms of the anteriority of migration. Nevertheless, these regions differ in the organisation of their diaspora. In

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<sup>2</sup> World Bank, annual remittances database.

<sup>3</sup> ONS (Office National des Statistiques), Algeria.

particular, emigration from Kabylia to France began at the end of the XIXth century and these overseas communities strongly replicate the organisation of the villages in the home region, with a very strict social control of the members.

### **Historical Context**

In order to understand the differences and importance of migration for these regions, a brief historical retrospective can be useful. French colonization met strong resistance in the Algerian countryside, and especially in the mountainous areas of Kabylia. Between 1830 and 1872, the French colonists waged a continuous war against the natives<sup>4</sup>. Kabylia was defeated in July 1857, but rose again between 1870 and 1871. Punishment was fierce and the insurgents were deported. The colonial power adopted a "scorched earth" policy by dismantling the early industrial structure (ceramics, watches ... ) which abounded in Kabylia. The result was a drop in the native Algerian population from 3 million to about a little over 2 million and the impoverishment of the region, leading to significant internal migration, as well as international migration to France. Ever since this time, Kabylia's economy has been heavily dependent on remittances from migrants, especially from France.

During the period of French colonization, the region of Tlemcen (along with Kabylia, the Dahra and Aures) was also a major source of Algerian emigration. Migration accelerated after World War I, and especially after World War II, driven by France's labour needs. However, emigration from Tlemcen decreased significantly after independence, whereas it continued substantially for Kabylia. The region of Tlemcen is more integrated to the Algerian economy and much more connected to the networks of political power of the Algerian state<sup>5</sup>. Kabylia, on the other hand, remained isolated and its (limited) development was fuelled by its diaspora. The rise in unemployment in France in 1974 pushed the government to close its borders, which considerably increased the costs of migration and changed its nature. More recent

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<sup>4</sup> Bouchène A., Peyroulou J.-P., Tengour O. S. ; Thénault S. (editors) (2012) *Histoire de l'Algérie à la période coloniale*, La Découverte, Paris et Stora B.(2004) *Histoire de l'Algérie Coloniale*, La Découverte, Paris.

<sup>5</sup> For example, the current Algerian President is originally from Tlemcen.

waves of migration have striven to cut some costs, such as those associated with installation and information. The reduction of costs of migration has likely allowed poorer classes of the population to emigrate.

Many older Algerian emigrants spent all their working lives in France, receiving their (French) pensions on returning home. As a result, income from migration exists not just in the form of earnings sent from France, but also includes pensions. Such pensions are clearly much more important in countries participating in the oldest waves of migration, such as countries with colonial ties to their ex-colonizing countries. Previous studies have rarely considered pensions as a component of foreign revenues due to the lack of information in most surveys. However, these pensions represent a huge part of their income for migrant-sending households in countries like Algeria, which have a long history of migration.

### **Objectives**

The aim of this paper is to analyse the impact of migration on poverty and inequality in two regions with different characteristics in terms of diaspora organisation and regional insertion. The impact should differ according to the theoretical and empirical literature, which suggests a non linear relationship between the age of emigration on the one hand and the level of inequality in the families left behind on the other hand. Migration should have a stronger impact on reducing poverty in the poorest households in regions where the proportion of migrants who remit money is higher due to the intensity of links with their diaspora.

To estimate the impact of remittances on poverty and inequality, we compare current household income to several counterfactual scenarios. In addition, our original data allow us to examine separately the impacts of remittances and retired migrants' pensions. A comparison of the results for the two regions is also carried out taking into account their historical features and their differences in terms of diaspora organisation.

Section 2 of the article sums up the literature dealing with the effects of remittances on poverty and inequality, in particular that based on household survey data. Section 3 describes the methodology used to formulate different counterfactual scenarios. Section 4 presents the data and descriptive characteristics of households using the DiNardo-Fortin-Lemieux (DFL) 1996 methodology. Section 5 provides the results of the impact of emigration on poverty and inequality, using the counterfactual model based on Heckman selection-corrected estimates. Section 6 concludes.

## **2. A Review of the Literature on the Impact of Remittances**

While studies looking at the impact of remittances on poverty are unanimous in indicating a reduction in poverty, studies on inequality differ, especially as a function of the income level of the home country.

Studies generally show a significant impact of transfers on poverty reduction in home countries, whatever method is used. Adams and Page (2005) have shown that for low-income countries, a rise in 10% of the migrant population leads to a fall of 1.9% in the share of people living on less than \$1 a day. This result has been also been found in sub-Saharan Africa (Gupta, Patillo and Wagh, 2007), and Central and Southern America (Acosta *et al.* 2008). Adams (1989) estimated that transfers reduce poverty in Egypt by 2.4% using a counterfactual-based methodology. This was also the case for Fiji Islands and Tonga (Brown and Jimenez 2008) and for Mali (Gubert *et al.* (2010). The results were even clearer for Burkina Faso, where the effects estimated by Lachaud (1999) are far greater.

The way in which poverty is calculated varies widely from one study to another and may explain these differences. Some researchers simply use universal poverty thresholds, such as \$1 or \$2 per day, which facilitate international comparisons. Others measure poverty in terms of gravity, intensity and incidents like Adams *et al.* (2005). Using a sample of 71 countries,

they found that a rise in the number of migrants of 10% leads to a fall in poverty, for all three indicators used. Adams (2006) also uses these three measures of poverty in a study of Ghana, where he concludes that remittances do indeed reduce the number of poor people, but that the impact varies according to the indicator used. In their study of Nigeria, Chiwuzulum Odozi *et al.* (2010) also look at thresholds of relative poverty in addition to these three indicators,<sup>6</sup> but once again find the same the result. Other authors estimate the impact of transfers on poverty via consumption, finding similar results as the income-based studies. Lastly, Esquivel and Huerta-Pineda (2007) for Mexico, defined poverty using three indicators: food, capacities (health and education) and assets owned.

The results are less unanimous concerning the impact on inequality. Stark *et al.* (1986) compared Gini coefficients for Mexican households and found that remittances did equalise the distribution of income, especially for people with networks in the United States. Taylor *et al.* (2005), using an identical Gini index decomposition method, found that inequality rises in Mexican rural areas when migration begins and networks are limited but fall as migration intensifies.

Using a counterfactual income scenario, Adams (1989) found that remittances increased income inequality in rural Egypt because migrants tend to come from families belonging to higher classes, which have a tendency to transfer more money than migrants from the lowest quintile. But the impact of migration on inequality depends on the characteristics of individuals, and especially on the wealth of the countries studied. The results may be reversed as far as inequality in the poorest countries are concerned. For example, Barham and Boucher (1998) have estimated that transfers to Nicaragua reduce inequality. Acosta *et al.* (2008) have also found there to be a reduction in inequality. But this is much lower for about 10 countries

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<sup>6</sup> The latter is not commonly used when studying developing countries, as absolute thresholds are often preferred.

in Central and Latin America. Gubert *et al.* (2010) calculated that remittances led to a reduction in the Gini coefficient in the order of 5% in Mali, or that they had no impact.<sup>7</sup>

In fact, a consensus can be found if one considers that the relation between migration and inequality is nonlinear with respect to the anteriority of the diaspora. McKenzie and Rapoport (2007) show an inverse U-shaped relationship between emigration and inequality for Mexico. Ebeke and Le Goff (2009) show a similar result for a panel of 80 developing countries.

### **3. The Empirical Method**

Differences in household characteristics may explain income inequality. To analyse their effects across households on the distribution of incomes, we first employ the non-parametric technique developed in DFL. We then deepen the analysis with a parametric counterfactual model, which allows us to estimate the impact of migration on the distribution of household income.

#### **3.1. Distribution of characteristics across households: non-parametric approach**

In order to examine the effects that different distributions of characteristics across households with and without migrants might have on the distribution of incomes, we adopt a non-parametric technique (DFL) developed by DiNardo, Fortin and Lemieux (1996). This technique is based on reweighting the distribution of characteristics of treated (with migrant) households so that they resemble the distribution of control (non-migrant) households, and then comparing the resulting "counterfactual" distribution with the original distribution. More precisely, instead of estimating the unconditional density of income with standard kernel density estimation techniques, each observation in the treated sample (households with migrants) is weighted by the ratio of the estimate of the density of the observed value for the treated population to the estimate of the density of the observed value for the control

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<sup>7</sup> As the authors themselves noted, gaps of 5% are not statistically significant. In this case emigration will have no impact on inequality in Mali.

population. For example, if a probit model is used to estimate the probability of having a migrant ( $P(\text{Mig}|X) = \Phi(X\hat{\beta})$ ), then the weight used in the kernel estimates is calculated as  $\frac{P(\widehat{\text{NoMig}}|X) P(\text{Mig})}{P(\text{Mig}|X) P(\text{NoMig})} = \frac{1-\Phi(X\hat{\beta})}{\Phi(X\hat{\beta})} \frac{\text{PctMig}}{\text{PctNoMig}}$ , with PctMig being the share of households with a migrant in the population and PctNoMig being the share of households without a migrant.

### **3.2. Impact of migration on poverty and inequality: parametric counterfactual analysis**

The first studies on the impact of remittances on the income of families living in the country of origin simply looked at the sums of money sent by migrants in recipient household income. This so-called “naive” or “simple” scenario overlooks another important aspect, namely the income the migrant could have brought to the household had he/she not migrated. It is therefore necessary to compare the level of funds sent with the income opportunities the immigrant would have had by remaining in the home country. Not taking these opportunities into account is a significant bias towards over estimating the impact of money sent.

One of the first counterfactual analyses of remittances was undertaken using estimates of income only for households with no migrants (Adams, 1989). Transposing coefficients obtained for households with no migrants, onto households with migrants can only be done if the characteristics of the two types of households are identical or, in other words, if there is a random selection of migrants within the population.

This is not the case, because there is a self-selection of migrants as a function of their individual characteristics, as well as those of their families and their communities. The level of education is one of the leading causes of self-selection among individual characteristics. Migration may also result from a family decision, and in this case expected remittances would be the cause of migration, given certain family characteristics.

As there is a bias linked to the endogenous selection of families with emigrants, the use of ordinary least squares leads to over-estimating the impact of migrant remittances. Indeed, emigrants who are more qualified and better integrated into networks can obtain higher

incomes, on average, than persons who remained the home country. Modelling of this selection using Heckman's (1979) two step technique can correct for the bias due to endogenous selection. This modelling was already used for surveys in Latin America and sub-Saharan Africa (Barham and Boucher, 1998, Acosta *et al.*, 2008, Gubert *et al.*, 2010). Here we introduce a correction term in the equation of estimated revenues for households with no immigrants. This term takes into account the characteristics of households, both observable and non-observable, which are likely to be correlated with the decision to migrate.

The variable chosen to explain the probability of having migrated with no correlation to revenue is the number of boys within a household. Unlike other studies, we have no ethnic data, but as sociological analysis of Algerian migration to France showed long ago (Sayad 1977), there is often a division of labour between those who will stay to work the land or occupy a job in government, for example, and those who will migrate specifically to send home remittances when a family has a lot of boys. It can therefore be assumed, following Mansuri (2008) for Pakistan, that the more boys a household has, the greater will be the probability of sending migrants abroad, and justifying this variable as a determinant of migration in the selection equation.

The counterfactual labour income of recipient households, constructed using the equation for labour income by non-recipient households, is given as a production function whose reduced form is as follows:

$$\text{Log } R_i = \alpha + \beta F_i + \gamma CM_i + \mu_i \quad (1)$$

where  $R_i$  is the revenue of a household not receiving remittances  $i$ ,  $F_i$  and  $CM_i$  are respectively vectors of the family's characteristics and those of the head of household.  $\mu_i$  is the error term. The vector  $F_i$  includes all production factors measured at the household level, in other words, capital stock, where land is designated as physical capital stock, as well as human capital, measured as the sum of the number of years studied by members of the family

of working age. The size of the family is decomposed by age category, in order to estimate differently the productivity of children under 15 years old. Variables linked to types of revenues earned by at least one member of the family are included: a binary variable for agricultural income and a variable indicating the percentage of formal jobs in the family (measured here as jobs in companies or the public sector). Thus, by using this variable, it is possible to establish variants concerning the integration or not of the migrant in the formal labour market, had he/she not migrated. The  $CM_i$  vector is a set of control variables associated to the sex of the head of household and a regional dummy variable, which allows incomes to be distinguished between the two Algerian areas.

Heckman's selection equation is modelled using a probit specification.

$$M_i^* = \alpha_m + \beta_m Fi + \gamma_m CM_i + \omega Zi + \mu_i \quad (2)$$

with

$$M_i = \begin{cases} 1 & \text{if } M_i^* > 0 \\ 0 & \text{if } M_i^* \leq 0 \end{cases}$$

where  $M$  equals 1 when the household does not receive remittances from migrants and 0 otherwise. The explanatory variables of Equation (2) are identical to those of the income Equation (1). The non-selection Equation (2) is however augmented by one variable, the number of boys in each family,  $Z_i$ , linked to migration and the remittance of funds, but which does not influence the income of households with no migrants. When the household does not receive money, the family has an income function of  $Y_0$ , and if the household does receive migrant remittances, then its income function  $Y_1$  has different coefficients.

Formally:

$$Y_i = \begin{cases} Y_{0i} & \text{if } M_i^* > 0 \\ Y_{1i} & \text{if } M_i^* \leq 0 \end{cases}$$

This non-selection equation allows the probability that households are non-recipients of transfers to be determined. Once this probability has been calculated, including the inverse of the Mills ratio into the labour income model corrects for the endogeneity of remittances.

A second component of household income is added to the labour income of all members of the family. This component stems from pensions received by family members who are no longer of working age,

$$P_i = \alpha + \beta F65_i + \gamma X_i + u_i \quad (3)$$

where  $P_i$  is the pension of a household not receiving remittances  $i$ .  $u_i$  is the error term and  $F65_i$  is the vector of the family's characteristics associated with the number of family members old enough to receive retirement pensions. The vector  $X_i$  is added to control for agricultural income or a Mujahedeen pension (related to the Algerian independence war) paid to at least one of the older members of the household.

The two equations of labour income (1) and pensions (3) allowed us to calculate counterfactual incomes, and hence construct counterfactual scenarios. Recall that to calculate the impact of foreign transfers, both remittances and pensions have to be subtracted from household income, with pensions often being greater than remittances. But it is important not just to conduct such a “naïve” analysis, so one must add back in the virtual income which the migrant would have earned by staying in Algeria:

$$\text{Counterf. revenue } i = \text{Obs. revenue } i - \text{foreign transfers } i + \text{virtual migrant income } i \quad (4)$$

Local virtual income is either the income a migrant of working age would earn or the local pension if the migrant had returned to Algeria for retirement. In fact, if the older migrant had not left, he/she would get a local pension rather than a foreign pension. By distinguishing between household income estimated with the coefficients of our estimation (Equation 1 for income from a local activity and Equation 3 for a local pension) and estimated household

income with a migrant and his/her characteristics (age, education and region of residence), it is possible to estimate the virtual revenue of a migrant within his/her household.

Counterfactual incomes, i.e. incomes had there been no migration, are calculated for all households. These counterfactual incomes are equivalent to observed income for non-migrant households (NOMIG), but are greater than observed incomes for families not receiving transfers (NOREM). The latter face a “double loss” of seeing a migrant leave (who cannot therefore provide labour for the household), and at the same time they do not receive any remittances in compensation. For families receiving remittances (REM), the counterfactual income will usually be lower because transfers from abroad are often greater than the virtual income of the migrant, though the virtual income could potentially be greater if transfers are very low. The counterfactual scenarios are used to examine the substitution possibilities between transfers of migrants and income generated locally by families who remain *in situ*. The more information there is to be taken into account about the migrant, the better the counterfactual scenario. In our case, we know exactly the number of migrants per family, their sex, age, level of education and commune of origin<sup>8</sup>.

We thus constructed three variants, which act as upper and lower bounds, concerning the integration of the migrants into the labour market, assuming that there is no migration:

- the low variant, which assumes that the migrants would not have gotten a formal job, i.e. employment in a company or in government.
- the intermediate variant, which assumes that the migrant has the same probability to obtain a formal job as other household members
- the high variant, which assumes that all migrants would have obtained a formal job in Algeria.

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<sup>8</sup> For lack of information, many studies had to make assumptions about certain variables such as the number of migrants or their level of education (see Gubert, Lassourd, Mesple-Somps, 2010).

It is clear that real situations fall between these variants, depending on the rate of unemployment, which is often high, and which is a determining factor in migration<sup>9</sup>.

## **4. A Descriptive Analysis of the Data of the Two Surveys Conducted in Algeria**

### **4.1. A new survey conducted in the regions of Tlemcen and Kabylia**

We conducted a survey in Algeria in spring 2011, interviewing families living in two communes<sup>10</sup>. The first commune was Nedroma, to the North West of the regional capital, in the *wilaya* (province) of Tlemcen. This is an Arab-speaking region with high migration rate. The second commune, Idjeur, is in the *wilaya* of Tizi Ouzou, a Berber region, also called Kabylia that has a strong tradition of organisation of the immigrants in the host country.

Three categories of household were questioned to avoid selection bias, and the questionnaire included several sections to this end: one section for households with migrants and transfers; one section for households with migrants, but no remittances; and lastly, a section for households with no migrants. For each commune, the initial quota was of 200 households in each category, i.e. a total of 1,200 households<sup>11</sup>.

The characteristics of family members regularly or irregularly living abroad were set out in detail (number of migrants, age, sex, level of education, marital status, occupation, year of departure, host country, means for paying remittances). This information was important in the calculation of our counterfactual analysis. One of the originalities of the survey was that it identified former migrants who had returned to Algeria and who receive pensions from their former host country, which was France in the very large majority of cases. Indeed, transfers

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<sup>9</sup> Following Barham and Boucher (1998), a better approach for correcting selection bias would have been to include two Heckman selection models, one for migration and one for integrating the labour market, but we do not have sufficient information to do so.

<sup>10</sup> The authors drew up the questions, but the collaboration of the *Centre de Recherches en Economie Appliquée et Développement* (CREAD), was vital to the conduct of the surveys.

<sup>11</sup> 75 questionnaires were incomplete or inconsistent and had to be taken out of the sample, limiting the total to 1,125.

from abroad were not limited only to money sent by migrants, but included pensions received by former migrants who had returned to Algeria.

The survey data were subsequently reweighted using data from the 2008 census (RGPH 2008) for the two communes (see Appendix 1). After calibration, the structure of the sample for the surveys was rendered identical to the structure of the population found in the census, for the variables used. Thus, the adjusted data concerning household equipment and facilities, the sex of the head of household, the size of housing and families are representative of the two communes, and cover more households than those interviewed. Overall, after calibration, 6,738 households from Nedroma were taken as representative of the population, and included in the statistical estimations, as were 1,864 households from Idjeur. It should be noted that these data are not representative of the whole of Algeria.

#### **4.2. A descriptive analysis of the variables used in the model**

The two regions were chosen because of their status as regions of emigration, even if the profile of the two communes is slightly different. The adjustment of the data using the census made it possible to estimate for both Idjeur and Nedroma the percentage of households which had never experienced migration (NOMIG); households with at least one migrant, but not receiving remittances (NOREM); and lastly, households with a migrant and receiving remittances (REM) (Figure A2.1 in Appendix 2). In the two regions studied, migration is very strong, as only 30% of households in Nedroma have never had a migrant member. The share is a bit greater in Idjeur, but does not cover half of all households. However, many more migrants from Idjeur send remittances. Among households who have migrants, nearly two thirds receive transfers (33.5% of the 51.3% of households with migrants). It should be stressed that many of the older migrants return to Idjeur and receive their pensions. In the commune of Nedroma, where migration is more recent, the percentage is much lower than the 70% of households with migrants: only half receive transfers.

Households receiving remittances (REM) are rather old, as the average age of their members is more than 48 in Idjeur (i.e. six years greater than the general average age for the commune), and 44 years in Nedroma (Figure A2.2 in Appendix 2), while the number of persons over 65 is more than twice the general average. The average head of household is 61 years old, more than 10 years older than other heads of household, while there are twice as many Mujahedeen pensions (7.6%) per household (Table 1). These households have received migrant revenues after retirement, and 36% receive their pensions from France. Women head 30% of these households, a high rate because husbands are often deceased. Age is certainly an explanation for the relative lack of education (less than 20 years of education for all members of the family combined). Lastly, these households surely live more on the land, as income from agriculture and land is more important than in other households.

Households with migrants but no remittances (NOREM) have very different characteristics. They are much younger, on average (a little over 40). The heads of household are aged 50, on average, receiving little in the way of Mujahedeen pensions. These are also the largest families (5.27 persons on average, with a migrant), and they have more male children, which could explain the departure of one family member abroad.

The other major difference stems from their place of residence, because they have very little income from agriculture and land. Youth and residency in towns may also explain why these families are the least educated (24.5 years of education for the whole family). But the young immigrants do not send money back home.

Lastly, families with no migrants (NOMIG) resemble the families with no remittances (NOREM) in that they are younger (39 years on average) and smaller (4.4 members on average) with fewer boys. In contrast, these families live much more in the countryside than other types of families, and more than 11% of these households receive agricultural income, nearly twice as much as households with a migrant, but no remittances (NOREM).

**Table 1: Household characteristics (averages by type of household)**

Type of household (TH)	Total number	Nedroma + Idjeur			
		REM	NOREM	NOMIG	WEIGHTED AVERAGE
Type of household in %	8,629	38.7%	26.9%	34.4%	100%
Total income	8,153	1,215,096	667,729	646,027	915,187
Remittances	8,044	500,899	0	0	500,899
Foreign pension	8,044	963,270	0	0	963,270
Foreign income	8,044	809,325	0	0	809,325
Size of local family	8,629	3.76	4.27	4.43	4.12
Size of family abroad	8,629	1.00	1.00	0	0.65
Number of under 15s	8,629	0.59	1.10	1.20	0.98
Number of 15-65 year-olds	8,629	2.59	2.95	3.12	2.86
Number of persons over 65	8,629	0.58	0.20	0.11	0.32
Number of men over 65	8,629	0.27	0.12	0.08	0.17
Number of women over 65	8,629	0.31	0.08	0.03	0.15
Number of males	8,629	1.45	1.90	1.34	1.54
% Households headed by men	8,629	70%	86%	93%	82%
Average age of head of household	8,629	61.3	50.0	48.5	53.9
% Households with at least one formal income / TH	8,629	65.5%	89.5%	92%	81.1%
% Households with at least one agricultural income / TH	8,629	10.3%	6%	11.3%	9.5%
% Households with at least one Mujahedeen pension / TH	8,629	7.6%	2.8%	4.6%	5.3%
% Households with at least one foreign pension / TH	8,629	36%	0%	0%	13.9%
% Households with at least some migrant transfers / TH	8,629	71.1%	0%	0%	27.5%
Index of physical capital	8,629	0.07	0.067	0.071	0.07
Index of land capital	8,629	0.47	0.40	0.44	0.44
Number of years of education in household	8,629	19.8	24.5	24.1	22.54

These descriptive statistics are recorded for each of the sub-samples (Idjeur and Nedroma) and described in Appendix 2. Nedroma does have a slight lead in employment in the public sector (37.5% of households have at least one public employee compared to 34% in Idjeur), but the differences are much greater concerning formal employment (84% compared to 66% in Idjeur). The informal sector is very important in Kabylia, in as far as villages have very

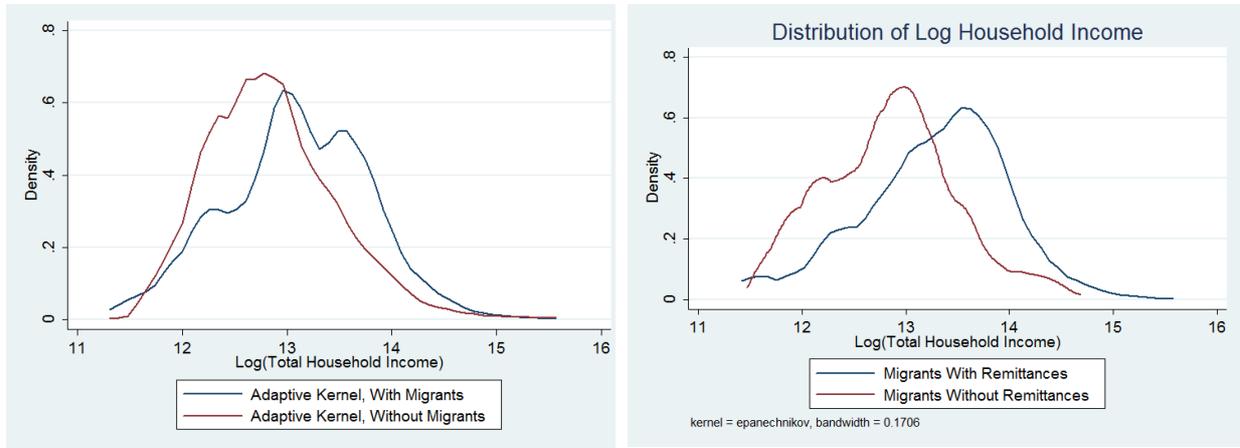
high rates youth unemployment. Nedroma is more open and is situated in the plain near Tlemcen. It has more shops and companies.

The commune of Idjeur has a much higher share of people over 65 (0.41 on average, compared to 0.29 in Nedroma). In contrast, the older households of Kabylia received twice as many Mujahedeen pensions as households in Nedroma (9% versus 4%). The number of boys per household, which is our exclusion variable, is 1.5 times higher in Nedroma. The chances of having migrants are thus expected to be greater in this commune, as the 70% of households in Nedroma with migrants bears out (compared to half of households in Idjeur).

The analysis in the “income” section (Table 1) stresses the higher level of resources of households with transfers (REM), whose total annual average income is on the order of DZ/A 1,215,000 (Algerian dinars), twice as high as the average income of households with migrants but no remittances, and higher than income of families with no migrants. The difference stems from foreign income (DZ/A 809,000), as local income is actually slightly lower than that of other households. It should be noted that pensions from abroad are, on average, much higher than remittances (DZ/A 963,000, compared to DZ/A 500,000). The share of pensions coming from France is a very important part of these foreign revenues, as 36% of households with remittances receive such pensions, while only 14% of households as a whole receive these pensions (Table A2.2 Appendix 2).

Looking at the full distribution of income, it is clear that households with migrants (MIG) are richer than those without migrants (NOMIG). Nonetheless, the proportion of households with migrants is larger among very poor households. (Figure 1)

Figure 1. Income distributions among households.



The share of households receiving foreign pensions is higher in Idjeur (17.5%), as it has a far higher share of migrants returning to Algeria on retirement, whereas households in Nedroma receive more transfers from migrants (29% compared to 22% for Idjeur). In contrast, nearly 20% of households in Idjeur have no local income and only survive on foreign remittances. This percentage is much lower in Nedroma: 8% (i.e. 92% of households have a local income). Total remittances received by households in Idjeur are 3.5 times higher than in Nedroma: DZ/A 293 million and DZ/A 82 million, respectively. The differences are due to the nature and distribution of transfers. In Idjeur, there are fewer current migrants who send money (excluding pensions), but the level of transfers is four times higher. Moreover, three times as many households receive foreign pensions in Idjeur than in Nedroma, and these are far higher than the average transfers. People who have returned to live in Algeria get their retirement paid in euros, which they capitalise on by using parallel exchange rates, so that their pensions have considerable local purchasing power<sup>12</sup>.

In our reduced form of the income equation (Equation 1), the physical capital stock and human capital stock are components of households income. The index of physical capital

<sup>12</sup> It should be noted that not all pensioners return to live in Algeria: some send part of their pension home, while spending their time in both countries.

stock is constructed using a multiple correspondence analysis (MCA), drawing on eleven goods (see Appendix 3). Households receiving transfers (REM) have a physical stock quite similar to others (Table 1). However, if the capital stock is related to the number of household members likely to contribute capital (i.e. who are older than 15), then the result is quite different across the communes (see the Figure A2.3 in Appendix 2).

We used the number of years studied by all members of a household as a means of measuring human capital.<sup>13</sup> A difference in education levels (measured in terms of the number of years studied) can be observed between households in Algeria and migrants abroad. On average, migrants are better educated, confirming their self-selection.

Households receiving transfers (REM) include many persons of older migrations, which explain their lower levels of education (the figure A 2.2. in Appendix 2). Households with no migrants (NOMIG) and households not receiving transfers (NOREM) are both younger and more educated.

Performing the analysis of the two regions separately reveals notable differences (Figure A2.4). Households in Idjeur have lower levels of human capital for all three household categories. This is explained by the economic and social structures of the two regions. The Nedroma region has high level of recent emigration with lower remittances. In Idjeur, much older emigration developed on the basis of low-skilled men going abroad. They left behind their families and returned home for retirement. Subsequently, family migration, which is not represented in our sample, occurred in the 1970s. For Nedroma, migration was more important and occurred later, comprising of more educated migrants.

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<sup>13</sup> Human capital is calculated by summing the number of years in education by all family members aged 15 or more, who remained in Algeria.

(1) – None, 0 years, (2) – Coranic School, 1 year, (3) – Preschool, 5 years, (4)– Primary education, 9 years, (5) – Average, 11 years, (6)– Secondary 12 years, (7) – Higher, 16 years.

**4.3. Impact of differences in characteristics across Households: the DFL approach**

Whereas the previous analysis focused on average differences, it is necessary to examine the features that are most important in explaining differences in performance between households across the whole distribution. The DFL technique provides for precisely this type of comparison. By reweighting the characteristics of households of one type (e.g. with migrants) to reflect that of another type (without migrants), one can directly examine the effect that different distributions of characteristics have on income distributions without having to make assumptions about differences in returns to observable characteristics.

Households with and without migrants differ significantly according to the characteristics that are important to the determination of income (Figure 2). Households with migrants have characteristics associated with higher levels of income than households without migrants. This confirms the existence of a selection effect affecting families that send migrants. Only limited differences in productive characteristics appear between households that receive remittances and those that do not, when focusing on households with migrants. Households receiving money have characteristics worth slightly more than families who do not receive, transfers from abroad. Figure 3 shows that the differences due to migrant status essentially reflect differences across regions, and across migrant status within Idjeur.

Figure 2 DFL. Comparison of households income distribution between families with and without migrants (counterfactual)

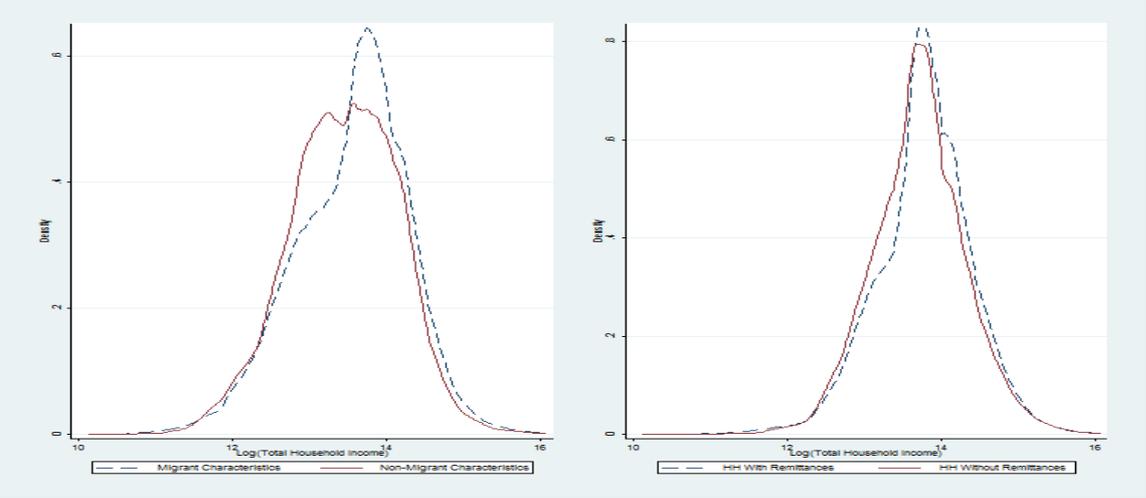
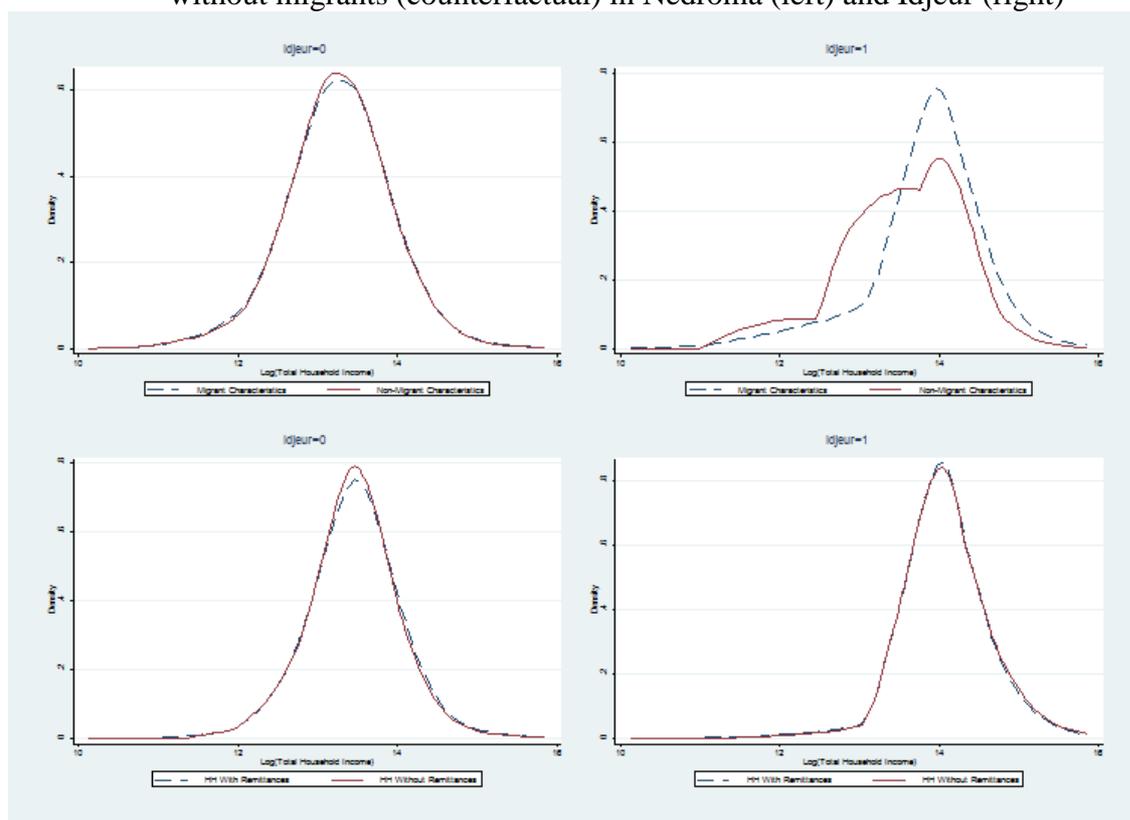


Figure 3. DFL. Comparison of households income distribution between families with and without migrants (counterfactual) in Nedroma (left) and Idjeur (right)



Going in to further detail (see Appendix 4), we can see that differences in the productive characteristics seem more important among households having no land than among households that own land, for example (see Figure A 4.1. in Appendix 4). Households with land that receive remittances are more homogeneous (and therefore lower income dispersion) than households with land that do not receive remittances characteristics.

Among households that do not receive farm income (probably located in cities), the differences in characteristics between households with migrants and others are more pronounced than in the group of households receiving income from farming (probably located in rural areas) (see Figure A.4.2 in Appendix 4). However, among households with migrants (MIG) differences in productive characteristics between households that receive remittances (REM) and other (NOREM) are larger for households with farm income.

Taking into account of sex of household head, few differences appear between households headed by women and those headed by men, although households headed by women are more

heterogeneous. Taking into account regional differences (Figure 3), Idjeur accounts more in the differentiation of household characteristics. It is for Idjeur that the differences are the most pronounced.

There is very little difference between households with and without migrants, or with and without remittances, once one conditions on the region (the multimodal distribution at the top right seems due to a sampling artifact rather true multimodal distribution, as the distribution of characteristics of households without migrants is unimodal like all others). This is particularly interesting because it suggests that the source of variation in the productive characteristics previously observed was primarily due to the specificity of the Idjeur region.

## **5. Impact of migration on poverty and inequality: a parametric counterfactual approach**

### **5.1. Heckman counterfactual**

The results of the estimation for both regions together – Nedroma and Idjeur – with a regional dummy variable are presented in Appendix 5 and concern labour income for households (column 5a of the Appendix table) which never had migrants. It is corrected for the selection bias associated with not having a migrant by the selection equation in column 5b in the Appendix table. The selection equation confirms the use of our exclusion restriction variable, which is strongly significant: the greater the number of sons per household, the lower the probability of the household never having had a migrant.

Other regressors in the selection equation allow the model to be identified and explain the non-migration (and conversely migration) of a family member, such as the size of family and especially the number of young people, the male sex of the head of household and agricultural or formal employment. More young people reduces migration, which confirms our previous statistics that the average age of households. Algerian families with a woman as head of

household have a higher probability of having a migrant. These families are often poor, because the husband has either left or is deceased. They badly need income from migration. In contrast, the need for income is lower in families in which members already have agricultural employment or formal employment, such as in government. Not having a formal, and hence stable income, is a “push” factor in migration. Even though the coefficient is not significant in the two regions, it may be observed that more years of education for household members (of working age) reduces the probability of never migrating. These results for skilled migration are already known in the literature, especially for Maghreb countries (Bollard, Mc Kenzie, Morten, Rapoport, 2011). Finally, the regional dummy variable confirms that there is much less migration in Idjeur than Nedroma. It should be recalled that a little less than half of families in Kabylia have migrants, compared to two thirds in the Tlemcen region.

The coefficient of the inverse Mill’s ratio is significant for households not receiving transfers. This confirms that a correlation exists between the error terms of the non-migration selection equation and the income equation, and that a selection bias would have been present in simple OLS estimates.

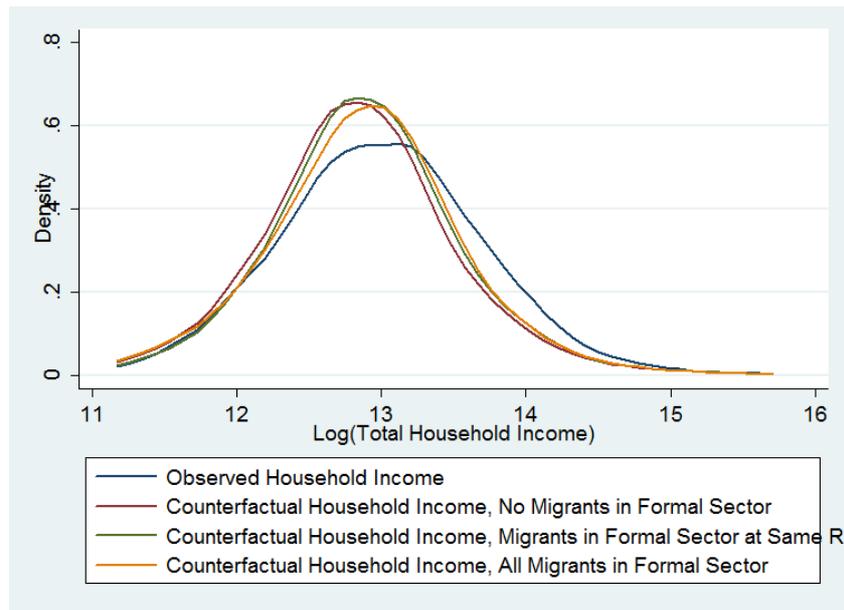
The labour income equation (column 5a) describes the importance of certain factors of production: physical capital stock and the number of persons working in the household. The greater the household’s capital stock, the higher is its income. Families’ demographic composition, and especially the number of persons working, raises income. The contribution of each member of working age is also related to the number of years of education. Human capital acts positively on earned income, even if the level of the coefficient is not very high and significant. Education is in fact little valued in these Algerian regions of emigration, where there is a significant phenomenon of deskilling in the labour market. Graduates and qualified young persons are obliged to accept jobs with lower skill demands than their

qualifications would lead them to hope for. Household income is also higher if a household member is employed in a company or government with a formal income, or is working in the agricultural sector. The marginal impact is much weaker for agricultural income. This undoubtedly reflects the decrease in land use on the one hand, and on the other hand the crowding out by the development of non-tradable goods and services of the productivity and profitability of agriculture, especially in mountainous areas such as Kabylia. The obligation to work the land, given low farm profitability, expresses the weakness of other factors of production. This is most commonly associated with the abandonment of agriculture in the economic development of Algeria, which is increasingly rent-based in nature. This is especially so since the failure of the agrarian revolution in the 1980s, and the continuous rise in the price of hydrocarbons.

As the total income of a non-recipient family consists not only of earned income but also local pensions, it is important to estimate the expectation of a pension (column 6 in Appendix 5). It is much more difficult to make estimates on pensions since we do not know the situation of the family at the time of emigration, and we have no information about the former jobs of retirees. A simple least squares estimation allows a local pension to be included in the estimates, distinguishing persons who have a Mujahedeen war pension. It may be noted that families in the countryside who have a farm income have lower pensions, because local pensions are drawn from formal employment and these jobs are much rarer for them.

With these estimates, one can construct and compare observed and counterfactual household income in order to measure the differences due to migration and transfers.

Figure 4 : Distributions counterfactual income for the two regions



With income from migrant remittances, there is a shift in the position of middle income households to a situation of higher incomes (Figure 4). The proportion of poor households is also higher in the counterfactual income distributions without migration. It therefore appears that migration reduces poverty.

In addition, comparison of counterfactual income scenarios shows that a formal occupation by the migrant in the hypothetical case where it would not have emigrated also reduces poverty, but by less than having somebody migrate.

Figure 5a. Nedroma Income Distributions

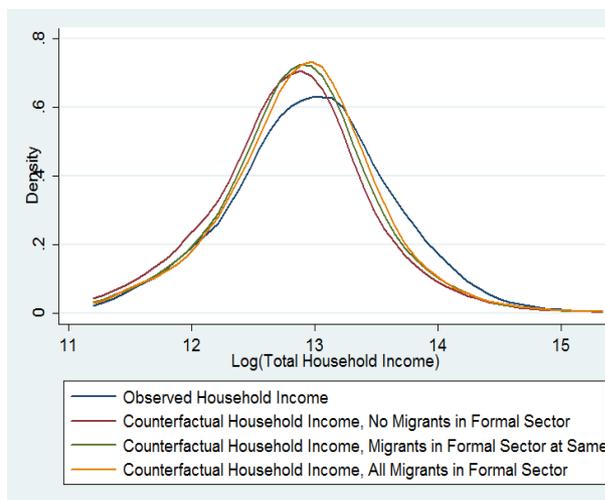
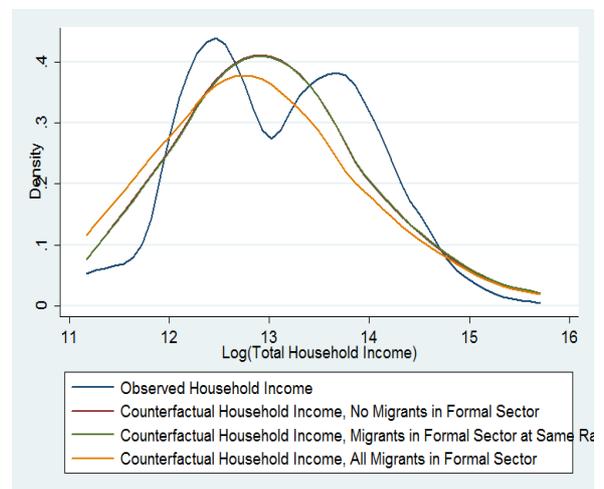


Figure 5b. Idjeur Income Distributions



Although the results for Nedroma (Figure 5.a) are similar to those described for all Algerian regions, there are some specificities for Idjeur. A more unequal distribution of income is observed with a bipolarity of households around the median, a moderately poor group and a moderately rich group. The curves show that, without migration, there would be many more poor households (Figure 5.b.). But income transfers from abroad do not benefit the richest households. Indeed, the top decile of the income scale, corresponding to the income of the richest households, is higher in the absence of migration.

## **5.2. The impact of counterfactual scenarios on poverty**

Our analysis of the impact of migration and remittances focuses on two poverty measures:

- extreme poverty, defined by the World Bank as a household with a per capita income lower than \$ 1.25 in purchasing power parity, equivalent to DZ/A 37,000 annually;<sup>14</sup>
- the \$2 per day at PPP poverty level, or DZ/A 60,000 annually;

In our calculations, we compare the observed poverty rate (with migration), and the three counterfactual poverty rate scenarios. The strong variant of counterfactual income (without migration but with formal employment) should be seen as a lower bound for poverty because it is assumed that all migrants would have found formal employment if they had stayed in Algeria. We know that this alternative is not credible because a lack of jobs in companies and the government is one of the reasons for emigration (see Appendix 5), and the unemployment rate in these two regions exceeds 50% for young people.

For middle-income countries, it is often preferable to use a threshold of \$ 2 per day. Measured according to this threshold, the average poverty rate in the Maghreb region fell from 19.7% in 1990 to 16.3% in 2005. Both the regions here are somewhat poorer, since 19.6% of

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<sup>14</sup> Extreme poverty is defined by the World Bank as existing on an income of less than \$1.25 a day, at purchasing power parity (PPP), or \$0.78 a day in Algeria, which is equivalent to DZ/A 102 per day at the official exchange rate (in 2011), or DZ/A 37,000 annually. The usual poverty threshold considered is the \$2 a day level (at PPP), or DZ/A 164 at the official exchange rate (in 2011), or DZ/A 60,000. A final rate of \$2.5 a day (at PPP) is also taken into account, which in Algeria is equivalent to \$1.57 a day (at PPP), or DZ/A 205 (at the official exchange rate of 2011), or DZ/A 74,000.

households live below the standard poverty line of \$2 (Table 2) in 2011, observed with migration. With the extreme poverty threshold of \$ 1.25, the poverty rate is 6.9%.

For the average poverty rate, which corresponds to an income of \$2 at PPP (or DZ/A 60,000 per year), the impact of remittances and pensions from abroad is significant and positive, as is the case of most studies on the subject. The counterfactual poverty rate would be 32.7% in the intermediate scenario, or 13.1 percentage points higher. Thus, we estimate that emigration income halves the number of people living below the average poverty threshold (\$2 a day), confirming that emigration is a factor in reducing transitional poverty.

**Table 2: Poverty rates in the communes of Idjeur and Nedroma: observed rates and counterfactuals (with no migration)**

Two Regions : Nedroma and idjeur	Observed Income	Counterfactual Household Income, No Migrants in Formal Sector	Counterfactual Household Income, Migrants in Formal Sector at same percentage	Counterfactual Household Income, All Migrants in Formal Sector
Type 1 < 37 000 DZ/A, 1,25\$	<b>6,9%</b>	17,5%	16,0%	9,1%
Type 2 < 60 000 DZ/A, 2\$	<b>19,6%</b>	36,2%	32,7%	30,6%
<b>Nedroma</b>				
Type 1 < 37 000 DZ/A, 1,25\$	<b>8,1%</b>	17,3%	15,7%	8,3%
Type 2 < 60 000 DZ/A, 2\$	<b>19,7%</b>	36,3%	32,3%	29,9%
<b>Idjeur</b>				
Type 1 < 37 000 DZ/A, 1,25\$	<b>2,0%</b>	18,3%	17,7%	12,6%
Type 2 < 60 000 DZ/A, 2\$	<b>19,4%</b>	35,6%	34,4%	33,7%

The results for extreme poverty are particularly remarkable. Measured against the threshold of \$1.25 per day at PPP (DZ/A 37,000 annually), the rates of most countries in the Middle East and North Africa are relatively low: extreme poverty generally affects less than 4% of the population (with the exception of Yemen, the only low-income economy in the region in which the poverty rate has increased in recent years). In the case of the Nedroma and Idjeur samples here, the rate of extreme poverty observed is a bit higher, at 6.9%. Extreme poverty calculated from counterfactual income without migration is higher (17.5%) in the pessimistic scenario than observed poverty by 10.9 percentage points. As was obtained previously and is typical of the impact of emigration on the average poverty, emigration also reduces extreme poverty, regardless of whether or not we assume the migrant can find formal employment. The number of households living below the extreme poverty line is divided by 2.5 through remittances.

The effect of hypothetical occupation of formal employment would reduce so much less sensitive poverty compared to the effect of remittances. In the absence of formal employment poverty is 36% and in the high scenario where all migrants occupy formal employment, the poverty rate is 30.5%, a decrease of 5.5 points. This decline in poverty by the occupation of a

formal employment does reduce poverty, but by only a third of the decrease that migration can bring. As soon as a household receives transfers, even if only marginally, such foreign income typically lifts them out of extreme poverty. Two factors help explain this:

i) The minimum monthly income in Algeria was DZ/A 15,000 in 2011 (€100 at the unofficial exchange rate). A migrant only has to transfer the equivalent to the poverty line – around €15 monthly – to lift a person in the household out of extreme poverty. But we know from our research that emigrants transfer on average DZ/A 40,000 per year (€350).

ii) The second explanation lies in the purchasing power premium afforded by the unofficial exchange rate which is used for more than 90% of transfers. The unofficial exchange rate yields a purchasing power premium of 50%, compared to the official exchange rate.

In Algeria a pensioner who transfers a very low pension earned in France, equivalent to €600 per month, can obtain DZ/A 90,000, at the unofficial exchange rate €1 to DZ/A 130 (the average over the past three years), compared to DZ/A 80 at the official rate. This amount is nearly five times the Algerian minimum wage (the daily wage of a construction worker is DZ/A 1,000 or about €7).

Moreover, the prevalence of extreme poverty is an important difference between the two regions of our investigation. In the region of Tlemcen (Nedroma), the rate of extreme poverty is four times higher: 8% compared to only 2% in Idjeur. In Nedroma, a little less than half of households below this threshold have no migrants and 53% have migrants who do not send remittances.

Households without transfers (NOREM) are much less frequent in Idjeur. If in Idjeur (Kabylia) the number of households below the poverty line is lower, this is probably due to the very strong structures favouring family and group solidarity, related to rural collective redistribution mechanisms, and to strong processes for controlling the social behaviour of migrants. This control of migrants organized through village committees limits abandonment

families back home. The organization of village committees is replicated abroad, especially in the Paris region where the social sanctions against migrants who do not remit are very strong<sup>15</sup>.

Remittances from abroad reduce the rate of extreme poverty by 16 percentage points in Idjeur relative to the pessimistic scenario. Without emigration, the rate of extreme poverty should be about 18%, versus 2% with emigration flows. As the obligation to remit is weaker in Nedroma than in Kabylia, the impact of remittances on the reduction of extreme poverty is only by 8 points percentage in Nedroma. In fact, households suffering from extreme poverty in Nedroma, have much more specific characteristics than in Kabylia: 30 % of them have emigrants among their members who don't remit money compared to only 17 % of household in Idjeur who have migrants and don't receive money (Appendix 2). This explains why households with migrants Nedroma suffer a double loss: less domestic revenue (as the migrant is not working in Algeria) combined with a relatively frequent absence of remittances to offset the loss. The plight of extremely poor households with migrants who do not pay remittances is a recurring theme in popular Algerian songs: the theme of the exiled emigrant who abandons his family and slides into despair and alcohol was the subject of ethnographic research in the 1970s.<sup>16</sup> Migration is seen as a curse in this setting, a net loss for the family. Families in this situation have always been in the minority, but the problem persists. These families live in extreme poverty and are often composed of women with children and/or elderly persons (parents) unable to work.

### **5.3. The impact of counterfactual scenarios on inequality**

Inequality studies compare comprehensive income distributions and often summarize these in a Gini coefficient. The Gini coefficient is calculated in relation to a function, which assigns

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<sup>15</sup> From the sociologist literature. See for example Sayad, 1999.

<sup>16</sup> Sayad, 1999.

each successive share of the population with its share of total income.<sup>17</sup> Again, we compare the observed Gini coefficient taking into account all incomes – including those from emigration – with the counterfactual situation, in which the Gini coefficient is estimated without migration and remittances, in order to assess the impact of migration on inequality.

The observed Gini coefficient (with migration) for the two regions is a little higher (0.38 in Table 3) than for the whole of Algeria (0.35).<sup>18</sup> Income distribution is especially more uneven Idjeur (0.446). For Nedroma, the distribution is identical to the national average.

The results summarized in Table 3 show that, although there are some changes in the point estimates of inequality in both regions, one cannot reject the hypothesis of no impact of remittances on inequality as measured by the Gini coefficient. Only the scenario without migration and without formal employment shows that the Gini coefficient for the combined regions would be 0.395 and significantly more unequal. Income transfers thus decrease the Gini index by 1.5 points (i.e. nearly 4%). In the other two scenarios, the indices are not significantly different from that observed.

Remittances have no significant impact on income inequality in Nedroma, whereas they reduce inequality in Idjeur. In fact, point estimates of inequality increase in Nedroma relative to the counterfactual scenario where the migrants would have been working in the informal sector. In contrast, the results show that the Gini index is higher by 3.8 points (0.484 against 0.446) in Idjeur for the first two counterfactual scenarios. Inequality would be reduced to Idjeur nearly 8% by migration. Remittances and pensions have benefitted the poorest families of Idjeur, improving their conditions and pulling them out of poverty. This result is less convincing for Nedroma, where transfers from abroad benefit all households, without changing the distribution of income.

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<sup>17</sup> The Gini coefficient is a measure of the degree of inequality of income distribution. The most egalitarian societies have a coefficient in the order of 0.2 (Denmark, Sweden and Japan), whereas the most unequal societies in the world have a coefficient of 0.6 (Brazil, Guatemala, Honduras, etc.).

<sup>18</sup> <http://www.statistiques-mondiales.com/gini.htm>

**Table 3: Distribution of incomes: Gini indexes by scenario**

<b>Two Regions : Nedroma and Idjeur</b>	<i>Estimate Gini</i>	<i>Std. Err.</i>	<i>Dif. obs.and counterfactual</i>	<i>Std. Err.</i>
Observed Household Income	<b>0,380</b>	0,019		
Counterfactual Household Income, No Migrants in Formal Sector	<b>0,395</b>	0,022	0,015*	0,008
Counterfactual Household Income, Migrants in Formal Sector at same percentage	<b>0,388</b>	0,021	0,008	0,009
Counterfactual Household Income, All Migrants in Formal Sector	<b>0,373</b>	0,021	-0,007	0,008
<b>Nedroma</b>	<i>Estimate Gini</i>	<i>Std. Err.</i>	<i>Dif. obs.and counterfactual</i>	<i>Std. Err.</i>
Observed Household Income	<b>0,354</b>	0,025		
Counterfactual Household Income, No Migrants in Formal Sector	<b>0,346</b>	0,027	-0,008	0,009
Counterfactual Household Income, Migrants in Formal Sector at same percentage	<b>0,367</b>	0,028	0,013	0,010
Counterfactual Household Income, All Migrants in Formal Sector	<b>0,359</b>	0,027	0,006	0,010
<b>Idjeur</b>	<i>Estimate Gini</i>	<i>Std. Err.</i>	<i>Dif. obs.and counterfactual</i>	<i>Std. Err.</i>
Observed Household Income	<b>0,446</b>	0,024		
Counterfactual Household Income, No Migrants in Formal Sector	<b>0,484</b>	0,028	0,038*	0,021
Counterfactual Household Income, Migrants in Formal Sector at same percentage	<b>0,484</b>	0,027	0,038*	0,020
Counterfactual Household Income, All Migrants in Formal Sector	<b>0,463</b>	0,023	0,017	0,017

More generally, differences in terms of income inequality between situations with and without migration are more pronounced in the lowest income quintile, and then for intermediate classes. These results show up the reduction in inequality due to remittances, which are similar to those obtained for the poorest countries. In the latter (such as Mali) it is usually the poorest families which receive transfers, which reduces inequality slightly, from 0.393 to 0.376 (Gubert *et al.*, 2010), or in the case of Haiti, Guatemala, or Nicaragua and Peru (Acosta *et al.*, 2008).

## 6. Conclusion

Migrant remittances are fundamental to economic policy issues and their effects need to be examined in context. The impact of remittances on the economies of migrants' origin is very

much linked to the characteristics of migrant families, as well as the regional specificities of in the country of origin.

For the commune of Idjeur in Algeria's Kabylia region, remittances have tended to decrease inequality in this poor region, because they contribute mainly to households in the lowest income quintile. By using a methodology for constructing counterfactual scenarios, we calculate that migrant transfers decreased the Gini coefficient by nearly 8%.

This study strongly highlights the importance of foreign pensions among transfers to these Algerian regions, where migration has a long history. Such pension transfers are of a higher value than income remittances.

Transfers do help reduce the numbers of persons living below the \$2/day poverty threshold by nearly 40%, with poverty rates falling from 32.7% to 19.6% in these regions. It should be added that the impact would be lessened were the regions to provide better local job opportunities, but the reduction due to migration would nevertheless be 35%.

The reduction of extreme poverty allowed by income from abroad is even more important. In Idjeur, where the power of village committees is very strong, transfers and pensions from abroad divided by 4 the number of households living below \$1.25 a day. In Nedroma the reduction is half as large because there are more extremely poor households who suffer from the phenomenon of "double loss", when a person migrates but the family receives no transfer. Migration worsens poverty in these families.

Three hypotheses explain the observed differences between the two Algerian regions.

- The historical course of emigration matters. In Nedroma, emigration decreased after the independence of Algeria, unlike in Kabylia (Idjeur). The percentage of older migrants able to transfer their French pensions back to their families in the region of origin is 50% lower in Nedroma than in Idjeur as a result.

- The conditions of the labor market are better in Nedroma than in Idjeur thanks to a better integration of this region within the national economy. Formal employment, which is more developed in Nedroma, contributes much more to the reduction of extreme poverty than in Idjeur. But remittances play a much more important role in reducing poverty, especially in Idjeur.

-The proportion of migrants who remit money is higher for the migrants from Idjeur. One of the explanations is related to the organization of the Kabyle diaspora in France, where village committees from the homeland are replicated and social pressure on diaspora members is likely to be stronger. The result is that the number of families that fall victim to the “double absence” (losing local income to emigration but receiving no money from migrants) is much smaller in Idjeur than in Nedroma.

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## **APPENDIXES**

### **APPENDIX 1: The Representativeness of the Survey**

To arrive at statistically acceptable representativeness, the survey carried out in Algeria drew on data from the RPGH 2008 census, for comparative purposes and to determine the readjustment weights of the Algerian sample.

The methodology used made it possible to correct the sample by re-weighting individuals, using the information available in relation to a certain number of variables that are significant for the analysis. The resulting calibration ensures that the sample is balanced as a function of the known quantitative variables for the population.

A Proc Calmar (SAS) is used for correction (marginal calibration). This permits adjustment at the margins (estimates based on a sample) of the contingency table of principle variables of the survey with margins for the population drawn from the 2008 census.

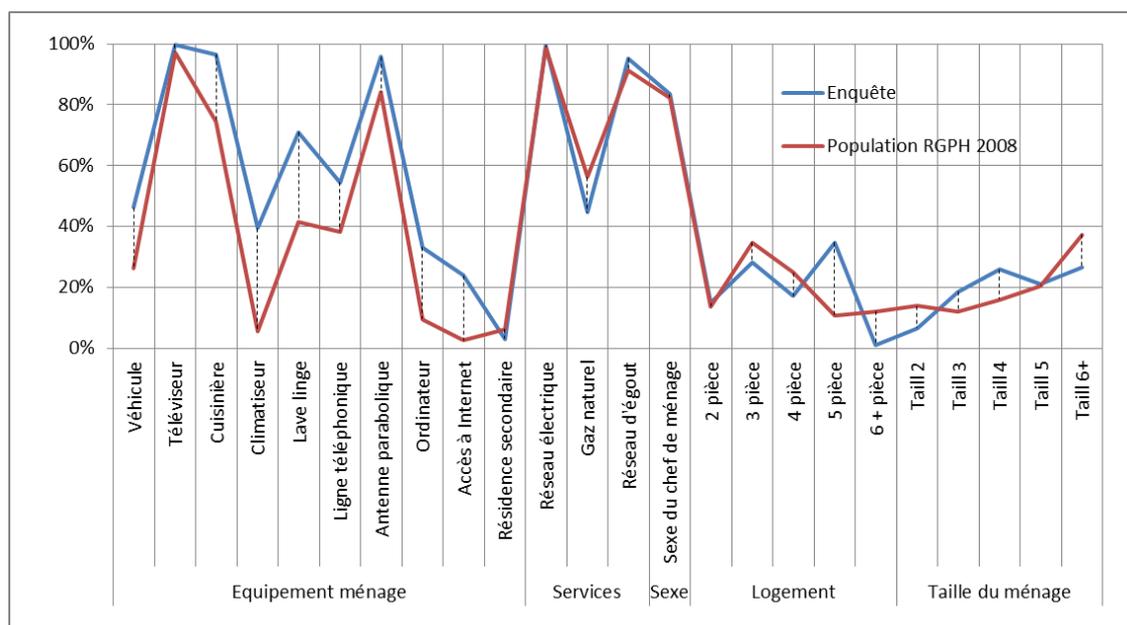
The variables used for correction are presented in the following table, which records percentages taken from the survey in Algeria with those calculated from the RGPH 2008. The calibration procedure was used separately for each commune. In other words, readjustment coefficients were calculated for each commune, taking into account the census and survey data. Final weights were subsequently compiled for the whole sample.

After calibration and reweighting, the structure of the Algerian survey is identical to the structure stemming from the RPGH 2008 census for the variables used. Thus the data readjusted on the basis of variables relating to household appliances, the sex of the head of household, the size of the family and its home are representative of the two communes of Nedroma (6,738 households) and Idjeur (1,864 households). But they are not representative of the whole of Algeria.

*A comparison of the structure of the Algerian sample and the RPGH 2008, by commune*

Variables	Enquête Algérie			Recensement RGPH 2008			
	Idjeur	Nedroma	Enquête	Idjeur	Nedroma	Recensement	
<b>Equipement ménage</b>	Véhicule	45.9%	46.6%	46.3%	28.9%	25.7%	26.4%
	Téléviseur	99.8%	99.7%	99.8%	93.5%	98.3%	97.3%
	Cuisinière	97.3%	95.7%	96.5%	70.3%	75.7%	74.5%
	Climatiseur	49.8%	29.0%	39.4%	4.4%	5.8%	5.5%
	Lave linge	57.2%	85.0%	71.1%	13.3%	49.4%	41.6%
	Ligne téléphonique	54.7%	54.4%	54.6%	13.6%	45.3%	38.4%
	Antenne parabolique	92.3%	99.2%	95.8%	63.7%	89.7%	84.1%
	Ordinateur	24.3%	42.2%	33.3%	12.4%	8.8%	9.6%
	Accès à Internet	22.0%	25.9%	23.9%	1.5%	2.9%	2.6%
<b>Résidence second.</b>	Résidence secondaire	2.8%	3.5%	3.2%	17.9%	3.1%	6.3%
<b>Services</b>	Réseau électrique	99.5%	99.5%	99.5%	97.8%	99.0%	98.7%
	Gaz naturel	7.5%	82.0%	44.7%	2.8%	71.1%	56.3%
	Réseau d'égout	98.7%	92.0%	95.3%	90.4%	91.6%	91.3%
<b>Sexe</b>	Sexe du chef de ménage	78.2%	88.8%	83.5%	77.4%	83.7%	82.4%
<b>Logement</b>	2 pièces	2.0%	7.2%	14.9%	11.3%	14.5%	13.8%
	3 pièces	12.6%	17.2%	28.3%	25.3%	37.4%	34.8%
	4 pièces	30.8%	25.7%	17.2%	23.3%	25.3%	24.9%
	5 pièces	17.6%	16.7%	34.8%	14.4%	9.7%	10.7%
	6 + pièces	36.9%	32.7%	1.1%	21.1%	9.7%	12.1%
<b>Taille du ménage</b>	Taille 2	11.0%	4.7%	6.8%	15.2%	13.5%	13.9%
	Taille 3	27.8%	9.5%	18.7%	10.6%	12.5%	12.1%
	Taille 4	32.3%	19.5%	25.9%	13.4%	16.9%	16.1%
	Taille 5	18.1%	23.9%	21.0%	13.8%	22.4%	20.6%
	Taille 6+	10.8%	42.4%	26.6%	47.0%	34.7%	37.3%

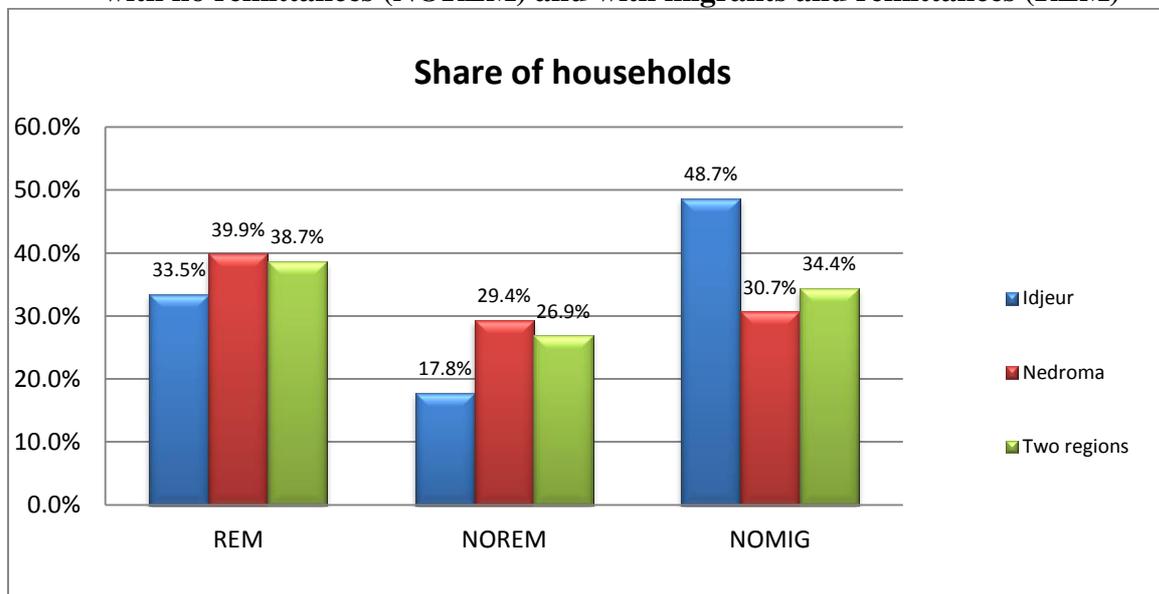
*A comparison of the structure of the sample and the RPGH 2008 for the two communes*



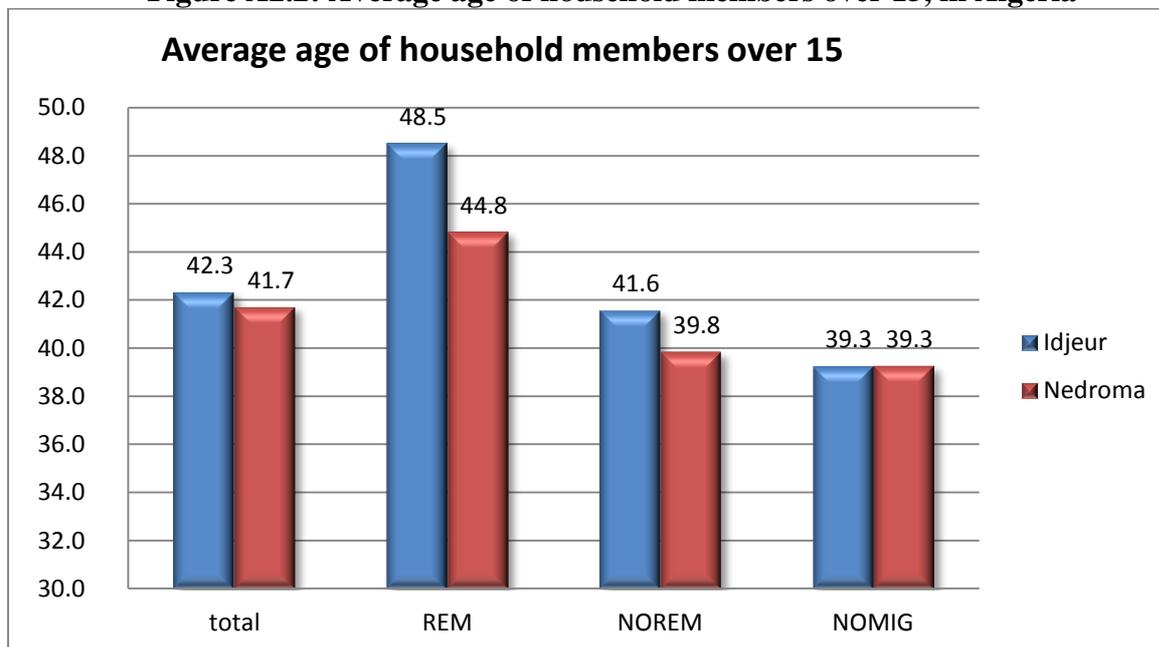
The weights obtained using the calibration procedure on the margins were used in the estimation of the econometric models.

**Appendix 2 : Statistics for Nedroma and Idjeur**

**Figure A2.1: The share of households with no migrants (NOMIG), with migrants, but with no remittances (NOREM) and with migrants and remittances (REM)**



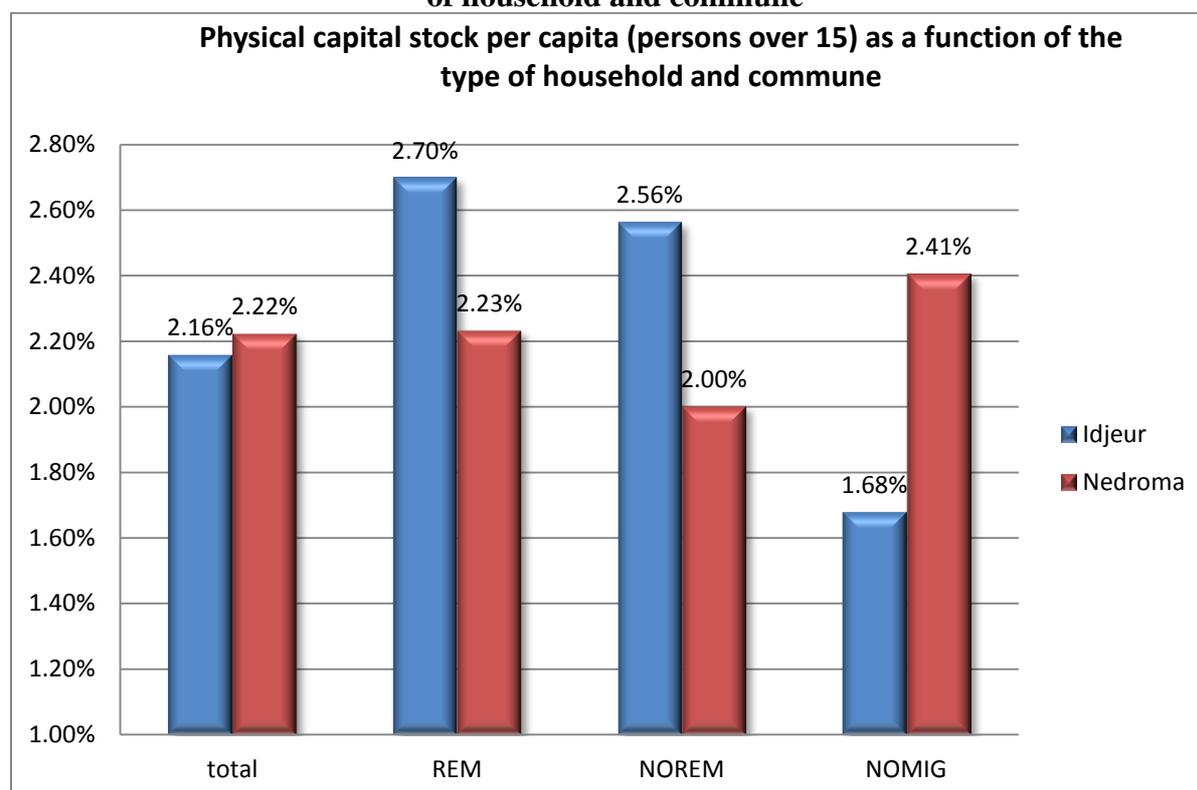
**Figure A2.2: Average age of household members over 15, in Algeria**



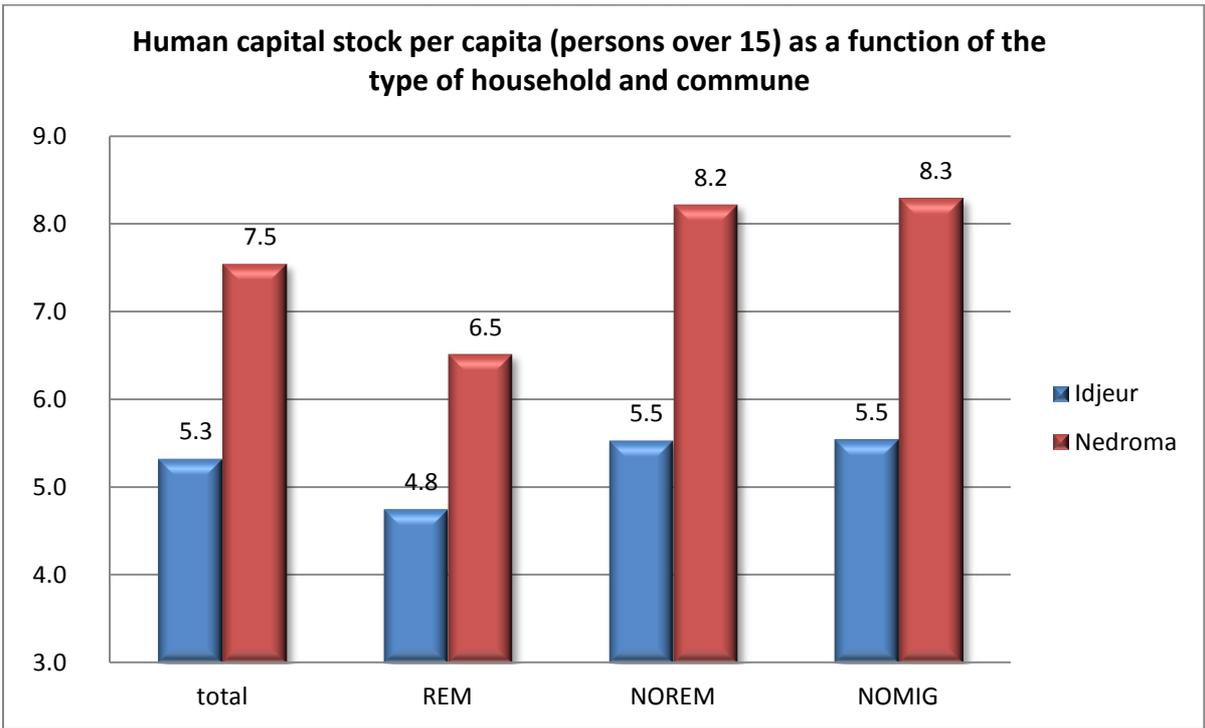
**Table A2.1: Sources of income per commune**

		Foreign pensions	Migrant remittances	Foreign income	Local income
Idjeur	As % of all households	17.5	22.8	34.9	80.9
Nedroma	As % of all households	13.0	29.0	39.9	95.1
Weighted average	As % of all households	14.0	27.5	3.8	92.0

**Figure A2.3: Physical capital stock per capita (persons over 15) as a function of the type of household and commune**



**Figure A2.4: Human capital stock per capita (persons over 15) as a function of the type of household and commune**



### **Appendix 3: Description of the Index of Household's Productive Capital Stock**

Based on questions relating to the ownership (or not) of productive assets, a synthetic, representative index of households' available capital stock was calculated. The questions concerned include the following goods and are coded as present/absent:

Transport equipment	Industrial machines
Commercial premises	Motor bicycles
Industrial premises	Computers
Residential property (other than family home)	Agricultural land
Sewing machines	Private cars
Agricultural machines	

A multiple correspondence analysis (MCA) was conducted to calculate the index of capital stock. It had a twofold objective:

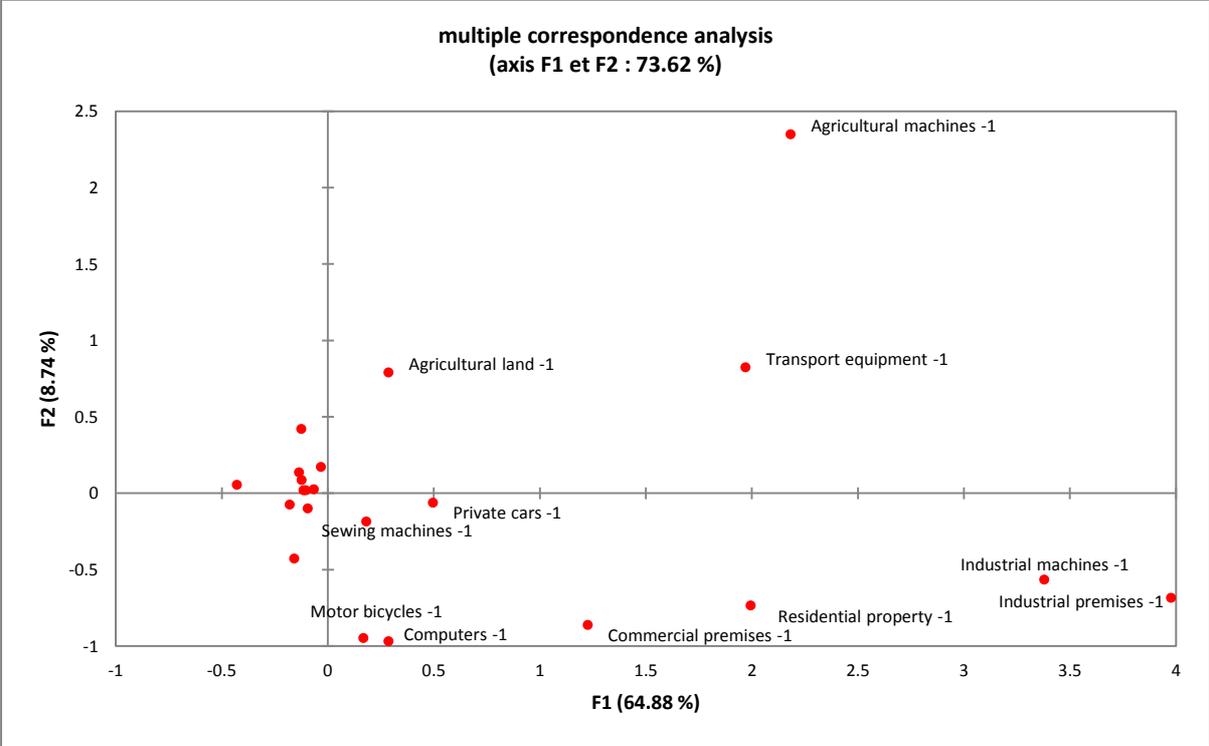
- the analysis and visualisation of correlations between variables, in order to limit the number of variables to measure subsequently;
- the procurement of non-correlated factors which are linear combinations of original variables, in order to use these factors in modelling methods such as linear or logistic regression.

The first axis (F1) summarises nearly 65% of the information contained in the variables used.

	F1	F2
Adjusted inertia	0.009	0.001
Adjusted inertia (%)	64.881	8.735
cumulative %	64.881	73.617
Variable	F1	F2
Transport equipment	35%	6%
Commercial premises	15%	7%
Industrial premises	41%	1%
Residential property (other than family home)	13%	2%
Sewing machines	2%	3%
Agricultural machines	20%	23%
Industrial machines	38%	1%
Motor bicycles	1%	16%
Computers	4%	41%
Agricultural land	5%	34%
Private cars	21%	0%

This first axis (F1) brings together productive assets linked to activities and occupations which are more urban (distribution, services, small industry/crafts/trades), whereas the F2 axis relates to agricultural activities (agricultural machinery and land). But it should be noted that the presence of computers in the household is virtually uncorrelated to F1, suggesting their

generalized use in urban areas. In contrast, computers are inversely correlated with the ownership of agricultural land and machinery, indicating that rural (and semi-rural) households are poorly equipped with computers. In this case, it is preferable to take agricultural income as the binary variable of agricultural activities.



Calculating a simple correlation between the axes, which are representative of different types of household equipment and the level of household income, yields a statistically significant correlation.

Correlation Matrix (Pearson) :

Variables	Revenues	Revenues (log)
Capital stock F1	<b>0.260</b>	<b>0.352</b>
Capital stock F2	0.021	0.017
<i>Agricultural capital</i>	<b>0.080</b>	<b>0.137</b>
<i>Computers</i>	0.055	<b>0.127</b>

p-values :

Variables	Revenues	Revenues (log)
Capital stock F1	<b>&lt; 0.0001</b>	<b>&lt; 0.0001</b>
Capital stock F2	0.497	0.580
<i>Agricultural capital</i>	<b>0.008</b>	<b>&lt; 0.0001</b>
<i>Computers</i>	0.067	<b>&lt; 0.0001</b>

The values in bold are different to 0, with a level of alpha significance of 0.05

**Appendix 4: DFL Comparison of households income distribution between families with and without land (counterfactual)**

Figure A4.1. DFL. Comparison of households income distribution between families with and without land (counterfactual)

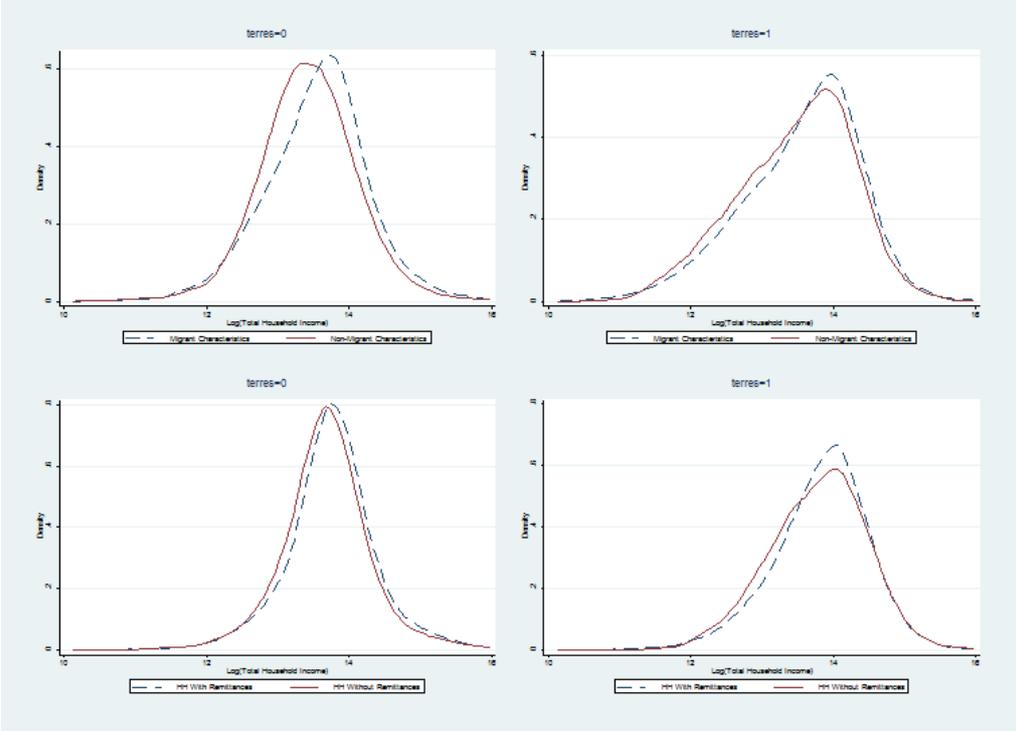
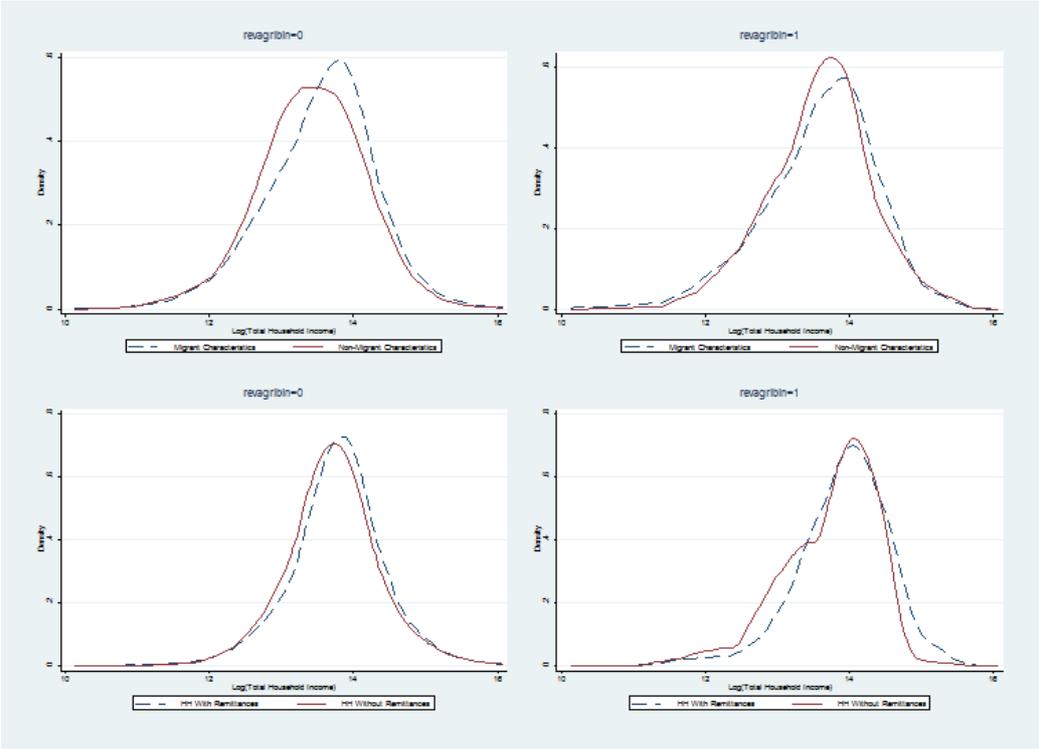


Figure A4.2. DFL. Comparison of households income distribution between families with and without farm income (counterfactual)



### Appendix 5: Estimation Results

VARIABLES	(1a) two-step Heckman Local Revenue (log)	(1b) Absence of migrants (Yes/No)	(2a) two-step Heckman Local Revenue (log)	(2b) Absence of migrants (Yes/No)	(3a) two-step Heckman Local Revenue (log)	(3b) Absence of migrants (Yes/No)	(4a) two-step Heckman Local Revenue (log)	(4b) Absence of migrants (Yes/No)	(5a) two-step Heckman Local Revenue (log)	(5b) Absence of migrants (Yes/No)	(6) Linear Local Pension
Stock of capital: Axe1	1.603*** (0.392)	0.158 (0.720)	1.487*** (0.357)	0.0396 (0.639)	1.326*** (0.338)	0.0436 (0.644)	1.540*** (0.363)	0.0231 (0.632)	1.375*** (0.334)	0.0846 (0.625)	
Local human capital (log)	0.0580 (0.0567)	-0.247** (0.110)	0.0913* (0.0490)	-0.0816 (0.103)	0.0719 (0.0479)	-0.0945 (0.101)	0.0878* (0.0509)	-0.0764 (0.102)	0.0678 (0.0493)	-0.0707 (0.101)	
Number of persons under 15 stayed	0.00357 (0.0589)	0.356*** (0.0933)	0.0584 (0.0523)	0.345*** (0.0933)	0.0618 (0.0464)	0.351*** (0.0908)	0.0619 (0.0545)	0.342*** (0.0913)	0.0610 (0.0472)	0.308*** (0.0918)	
Number of persons from 15-65 stayed	0.191*** (0.0576)	0.470*** (0.101)	0.208*** (0.0485)	0.399*** (0.0928)	0.200*** (0.0469)	0.409*** (0.0873)	0.219*** (0.0565)	0.395*** (0.0882)	0.204*** (0.0484)	0.363*** (0.0874)	
Number of over 65-year-olds stayed	0.0225 (0.154)	-0.119 (0.221)							-0.0723 (0.156)	-0.197 (0.216)	64056 (45961)
Sex of head of household (H=1)	0.0391 (0.243)	0.917*** (0.270)	0.224 (0.166)	0.979*** (0.287)	0.141 (0.160)	0.977*** (0.288)	0.242 (0.170)	0.979*** (0.287)	0.171 (0.160)	0.997*** (0.279)	
Agricultural income (Yes/No)	0.476*** (0.180)	0.644* (0.378)	0.704*** (0.166)	0.694* (0.359)	0.848*** (0.179)	0.681* (0.351)	0.635*** (0.201)	0.709** (0.335)	0.856*** (0.179)	0.832** (0.340)	-54052 (46976)
% formal jobs with income	1.517*** (0.374)	1.685*** (0.336)	1.869*** (0.259)	1.753*** (0.329)	1.837*** (0.257)	1.743*** (0.329)	1.932*** (0.280)	1.747*** (0.328)	1.884*** (0.264)	1.552*** (0.325)	

Number of boys in the household		-0.513*** (0.107)		-0.447*** (0.0977)		-0.458*** (0.0962)		-0.445*** (0.0961)		-0.441*** (0.0937)	
Idjeur (Yes/No)			0.435*** (0.136)	0.699*** (0.169)	0.550*** (0.149)	0.691*** (0.179)	0.410*** (0.154)	0.706*** (0.178)	0.561*** (0.141)	0.732*** (0.176)	184419*** (62582)
Ownership of farmland					-0.248** (0.111)	-0.0428 (0.207)			-0.242** (0.111)	0.0910 (0.260)	
Stock of capital: Axe2							0.253 (0.442)	-0.00709 (0.670)		-0.859 (0.849)	
Mujahedeen war pension											230289*** (55333)
Constant	11.07*** (0.657)	-2.176*** (0.314)	10.10*** (0.404)	-2.770*** (0.340)	10.35*** (0.384)	-2.728*** (0.361)	9.918*** (0.515)	-2.768*** (0.454)	10.27*** (0.376)	-2.236*** (0.498)	194031*** (30355)
Athrho		0.176 (0.726)		1.091*** (0.363)		1.136*** (0.349)		1.113*** (0.354)		1.259*** (0.314)	
Lnsigma		-0.828*** (0.110)		-0.644*** (0.150)		-0.656*** (0.141)		-0.640*** (0.149)		-0.625*** (0.134)	
Observations	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	1,076	76

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