

Decent work or migration?*

Théophile T. Azomahou[†]

Ababacar S. Gueye[‡]

Université Clermont-Auvergne, CERDI, CNRS, France

Preliminary version

Abstract

In this paper, we try to answer a simple normative question: between migration and access to a local decent job, which is the more effective way to reduce poverty? In Senegal as in other places, people tend to overstate the economic returns of migration. Does a decent job represent a good substitute for migration? To the best of our knowledge, no studies have attempted to compare explicitly the effects of a good local job and migration on poverty. We use data from the 2011 Senegalese Survey of Monitoring Poverty (ESPS 2011) and rely on a propensity score weighting approach as well as an instrumental variable strategy to correct for endogeneity bias due to self-selection in migration and access to a decent job. Proxies of migration and labor market networks captured from ethnicity and geographical location are used as instruments. The results confirm the economic literature on the positive impact of migration on poverty, but show that access to decent work has a similar impact on poverty even if we just consider migration to developed countries. Indeed a decent work, even if it is not highly remunerated, may enable people to have a forward-looking behavior and to care more about their future. We test this assumption on the investment in children's education and find that a decent job allows to invest more in children's education whereas we find little support of an impact of migration on education.

Keywords: poverty, migration, decent work, education, instrumental variable, network

JEL Classification: D12, I20, I32, J81, O15

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[†]E-mail: theophile.azomahou@uca.fr

[‡]E-mail: ababacar.s.gueye@gmail.com

1 Introduction

Developing countries face many challenges to reduce poverty and to take the path of economic development. Labor market issues are known as one of the main challenges faced by these countries. In Senegal in particular, access to jobs represent a crucial problem. The unemployment rate according to the International Labor Organization (ILO) definition is estimated about 10.3% (ANSD, 2013), well above the overall average in Sub-Saharan Africa which stands for 7.6%. The economic system produces so few jobs for the rising young population entering the labor market. Furthermore the unemployment rate is only partially informative of the functioning of the labor market. The precariousness of employment is a major concern, 32% of workers are underemployed (ANSD, 2013) and 87% are employed in the informal sector. The 2013 census data indicates that 60% of unemployed are aged between 15 and 34 (ANSD, 2016). This situation makes migration a valuable alternative for young people. Thereby, many young people opt to migrate to try to lead a better life beyond the borders of their country. Even when migration policies are more restrictive, people are moving towards illegal roads to reach Europe. Young Senegalese were particularly involved in the waves of illegal migration in the early and mid-2000s. Mbaye (2014) indicates that, in 2006, half of the 30,000 illegal migrants landed in the Canary Islands were Senegalese and argues that illegal migrants overstate the returns to migration. These aspects lead us to wonder about the real values of the returns to migration. In this paper we attempt to analyze which alternative between migration and access to a decent local job has greater impact on poverty reduction and human capital investments.

The positive impact of migration on poverty is a well-known fact as it was so widely demonstrated in the economic literature in different parts of the world: Acosta *et al.* (2008) in Latin America, Gupta *et al.* (2009) in Sub-Saharan Africa, Imai *et al.* (2014) in Asia and the Pacific etc. In West Africa in particular, micro studies find substantial positive impacts of migration. Lachaud (1999) shows a 14.9% reduction effect of remittances on poverty in rural Burkina Faso. Gubert *et al.* (2010) in the case of Mali find that remittances reduce poverty by 11%. In Nigeria, Chiwuzulum Odozi *et al.* (2010) find that remittances decrease poverty by 20%.

With its large diaspora, Senegal holds a wide stock of remittances which constitute an important source of income. Indeed, the share of remittances over GDP is about 11% (WorldBank, 2015) placing Senegal at the fifth position in Africa after Gambia, Leshoto, Liberia and Comoros.

On the other side, there is a strong link between labor market status and poverty. Having a good job is definitely one of the main drivers of poverty eradication. According to Salazar-Xirinachs Executive Director in the International Labor Office "having access to stable and protected employment is the most sustainable path to exiting poverty and promoting inclusion" (Cazes & Verick, 2013). Gutierrez *et al.* (2007) find that creating intensive jobs in the secondary sector and productive employment in agriculture lead to poverty reduction. Ernst & Berg (2009) argues that a raise in productive and remunerative employment increases poor's incomes which leads to a reduction of poverty.

Beyond the pecuniary aspect, a decent job contributes to reduce poverty through the stability of labor income, the security and the protection of employment. In fact a secure job, even if it is not very highly paid, allows people to manage smartly their income and to invest more in their family well-being. [Banerjee & Duflo \(2012\)](#) argues that when a member of the family gets a stable job, schools are more likely to accept his children, hospitals are more likely to provide high quality and more expensive cares for sick family members and the other relatives may be able to invest more adequately to develop their business.

To the best of our knowledge this is the first study which attempts to compare explicitly the impact of access to decent job and migration on poverty. Some papers rely on the seminal work of [Barham & Boucher \(1998\)](#) to create a counterfactual scenario in which migrants would be employed in local jobs. [Margolis *et al.* \(2015\)](#) in a study conducted in two towns in Algeria show that even in the more optimistic scenario where all migrants would have a formal work, migration would still have a significant impact on poverty. However these studies cannot account all the general equilibrium effects that will result to a massive integration of migrants in the local labor market. Our empirical strategy is different and analyzes more specifically the impact of access to decent employment. Basically, the theoretical idea is to consider migration and access to a decent job as two distinct programs implemented in a given population. Some households are exposed to one the two programs and a third group of households have not experienced any of the two programs, and so represent the control group. The purpose is then to assess the impact of these two programs in terms of poverty reduction and improvement of living standards. It is worth mentioning that in this analysis, the earnings abroad of the migrants are not considered. The focus will exclusively be on the well-being of the origin households. Obviously endogeneity problems are very likely to arise. In fact people are self-selected in the access to decent employment and migration as well. Not considering this issue can bias the estimates of the effect of migration and decent work on poverty. Controlling this endogeneity problem is often a tricky econometric challenge. We rely on an instrumental variable strategy to overcome self-selection due to migration and access to decent work. The instruments are proxy of the network of decent employment and the network of migration using geographical proximity and membership to ethnic group.

We use the Senegalese Survey of Monitoring Poverty (ESPS 2011) conducted in 2011 by the National Agency of Statistics and Demography (ANSD) and construct an index of decent employment using variables related to underemployment, social protection and stability of employment. We find significant and positive impacts on poverty reduction both for migration and access to decent employment and the magnitudes of the two effects are very close even when restricting migration to developed countries.

Following the reasoning by [Banerjee & Duflo \(2012\)](#), we test also the impact of these alternatives on human capital investments and particularly on children schooling. The economic literature on the effect of migration in the education of children left behind is mitigated (see [Dustmann & Glitz \(2011\)](#) for a thorough discussion). Parental migration can reduce the incentives to pursue education

for children left behind if they plan to migrate and if the return to education in the host country is low (McKenzie & Rapoport, 2011). The absence of parent and the credit constraints in the period of job search of the migrant can reduce children’s school attendance in the short run (Antman, 2011). Yang (2008) and Alcaraz *et al.* (2012) find that remittances rise child schooling and educational expenditure. Regarding the impact of employment on children’s education, Ruhm (2004) find evidence that maternal employment has negative impact on schooling while Schildberg-Hoerisch (2011) find no significant impact of parental employment on children’s education.

Our results show a high impact of decent employment on investment in children’s education and little support of a positive impact of migration.

The remaining of the paper is organized as follows. Section 2 presents a theoretical framework, section 3 presents the data and some descriptive statistics. Section 4 describes the empirical strategy. Section 5 discusses the results and section 6 concludes.

2 Conceptual framework

A household has n adults and c children and so $n + c$ members. Suppose all adults are active in the labor market . A worker can be low-skilled or high-skilled.

The household’s welfare is represented by the total consumption per capita C . Suppose first that the economy has only one sector, the labor market is not segmented and w is the unique wage in this sector. The household’s welfare is:

$$C = \frac{nw}{n + c} \tag{1}$$

High skill workers can get a decent job that is a high quality employment qualified as stable, secured and protected. Let w_d be the earning of a decent job such that $w_d = aw > w$ so $a > 1$.

However it is difficult to get a decent employment, not all high skill workers can have access to this kind of job. There is a queue in the labor market for getting a decent job. It exists then an opportunity cost to access a decent job which is the renounced wage during the period of job search. This opportunity cost is equal to uw where u is the unemployment duration and w the wage the worker would have if he decided to work in the low quality sector.

If one high-skill worker in the household has a decent job, the household’s welfare $C_{(d)}$ becomes:

$$C_{(d)} = \frac{(n - 1)w + w_d - uw}{n + c} \tag{2}$$

Instead of trying to get a decent work, the household may choose to send one member into migration. Our goal is to compare these two situations. Suppose that the migrant can be a high-skill or a low-skill worker. Let w_m be the earning of the migrant abroad. Migration is a risky activity and the migrant cannot know the exact salary he will get abroad. Thus w_m has a deterministic

component w_e and a random component ϵ such that the expectation of ϵ is null and its variance is equal to σ_ϵ^2 .

The wage equation for a high-skilled migrant can be written as:

$$w_m = w_e + \epsilon \quad (3)$$

And the wage equation for a low-skill migrant:

$$w_m = \frac{w_e}{2} + \epsilon \quad (4)$$

The migrant send to the origin household a share of his earning. Let r be this share such that $0 < r < 1$, so the amount of remittances received by the household is: rw_m . In unit of local wage, let $rw_m = bw$.

Denote K the total cost of sending a migrant abroad including monetary and psychic costs, the household's consumption per capita for a household with a migrant is:

$$C_{(m)} = \frac{(n-1)w + Exp(rw_m) - K}{n-1+c} \quad (5)$$

Where Exp is the Expectation operator.

For a low-skill migrant, the household's consumption per capita is:

$$C_{(m)} = \frac{(n-1)w + \frac{rw_e}{2} - K}{n-1+c} \quad (6)$$

For a household with only low-skilled adults, not sending a migrant is the best strategy if:

$$\frac{nw}{n+c} > \frac{(n-1)w + \frac{rw_e}{2} - K}{n-1+c} \quad (7)$$

$$(7) \implies \frac{nw}{n+c} > \frac{(n-1)w + \frac{rw_e}{2} - K}{n+c} \implies nw > (n-1)w + \frac{bw}{2} - K \implies \frac{K}{w} + 1 > \frac{b}{2}$$

Proposition 1:

For a household with only low-skilled adults, not sending a migrant and staying employed in the low level sector is the best strategy if the migration costs in local wage units plus one is higher than the amount of remittances sent by a low-skilled migrant.

$$\frac{K}{w} + 1 > \frac{b}{2} \quad (8)$$

The consumption per capita for a household with a high-skilled migrant is:

$$C_{(m)} = \frac{(n-1)w + rw_e - K}{n-1+c} \quad (9)$$

The household will choose a decent job if:

$$C_{(d)} > C_{(m)} \implies \frac{(n-1)w + w_d - uw}{n+c} > \frac{(n-1)w + rw_e - K}{n-1+c} \quad (10)$$

$$(10) \implies \frac{(n-1)w + w_d - uw}{n+c} > \frac{(n-1)w + rw_e - K}{n+c} \implies (n-1)w + aw - uw > (n-1)w + bw - K$$

$$(10) \implies a - u + \frac{K}{w} > b$$

Proposition 2:

For households with high-skilled workers, getting a decent work is a best strategy to improve the household's welfare if the decent work premium $(a - u)$ plus the migrations costs $(\frac{K}{w})$ is higher than the amount of remittances (b) .

$$a - u + \frac{K}{w} > b \quad (11)$$

u represents the difficulty to get access to a decent job. So if this difficulty is increasing, migration appears as a more valuable alternative.

Similarly, it is very intuitive to turn out that high migration costs and low expected values of remittances make migration a costly decision and a less worthy alternative.

We consider now the comparative impact of access to a decent work and migration on human capital investment or more specifically on children education.

Denote E as the household's investment in education. This type of investment is particular in the sense that, educational spending for a given child is very likely to last for many years and returns are produced in the very long run. In a developing context, such an investment is not affordable for many households.

So we assume that E depends not only on the household's welfare but also on the perception of the future welfare depicted by the fluctuation of the present welfare.

Thus E is a positive function of C and a negative function of $Var(C)$ (Variance of C). This negative relation between education spending and consumption volatility can be understood as a premium for stability.

$$E = \text{function}(C^+; \text{Var}(C)^-) \quad (12)$$

We analyze previously the conditions under which accessing a decent job is a more valuable alternative than migration, we are now interested in which alternative yields higher investments in education.

Suppose two households: a household with a decent worker and a household with a high-skill migrant which have equal level of consumption per capita. Education spending will then depends on the volatility of C .

The welfare for a decent worker household is deterministic so its variance is null:

$$\text{Var}(C_{(d)}) = \text{Var}\left(\frac{(n-1)w + w_d - uw}{n+c}\right) = 0$$

This variance for a high-skilled migrant household is:

$$\text{Var}(C_{(m)}) = \left[\frac{r}{n-1+c}\right]^2 \text{Var}(\epsilon) = \left[\frac{r\sigma}{n-1+c}\right]^2 > 0$$

Proposition 3:

$$\text{Var}(C_{(d)}) < \text{Var}(C_{(m)}) \quad (13)$$

The consumption of a migrant's household is more volatile than that of a decent worker's household. In this case due to the stability premium, the investment in education of the decent worker's household is expected to be higher.

However it is worth noting that some risk lovers households may migrate even if it is irrational to do so; i.e. even if $a - u + \frac{K}{w} > b$ (Proposition 2) because earning from migration has larger fluctuations. For these households, the stability premium no longer holds and they are more likely to invest more in education or in any other type of investment compared to other households. Thus the result on investment in children education between decent and migrant household may be ambiguous .

3 Data and Descriptive Statistics

3.1 Data and measurement of the main variables

We use data from the 2nd Senegalese Survey of Monitoring Poverty (ESPS 2011) conducted in 2011 by the National Agency of Statistics and Demography (ANSD). The survey is representative of the whole country and covers a theoretical sample of 20250 households. This sample is divided into two

samples. A reduced sample which is used in this paper represents about one third of the overall sample provides more detailed information on household consumption and an expanded sample in which a short questionnaire is applied. We work with a questionnaire of 5605 households distributed in all regions of Senegal.

Three key variables are used in this study and need some explanations regarding their measurement.

Poverty

Our main indicator of poverty is the annual household consumption per adult equivalent. This indicator can be a good proxy of household revenues, and in developing countries is even considered as a better indicator of poverty. As so well stated by Ravallion (1992), due to large variability of revenues particularly in rural areas and many measurement errors like recall bias "current consumption will almost certainly be a better indicator than current income of current standard of living" (Page 13). The adult equivalent allows to take into account the size of the household, the age of its members and the economies of scale in consumption. This indicator is directly taken from the computation of the National Agency of Statistics and Demography (ANSD).

As robustness analysis, we also use a dummy variable indicating if the household is poor or not. The poverty line is also computed by ANSD and stands for 879 FCFA (1.34 euro) for urban Dakar, 713 FCFA (1.09 euro) for the other towns and 478 FCFA (0.73 euro) for rural area.

Decent Work

The concept of decent work is since the early 2000s in the heart of the International Labor Organization (ILO) activities. The ILO (1999) describes decent work as "opportunities for women and men to obtain decent and productive work in conditions of freedom, equity, security and human dignity". Anker *et al.* (2003) highlight ten aspects to characterize a decent work: "Employment opportunities", "Unacceptable works", "Adequate earnings and productive work", "Decent hours", "Stability and security of work", "Combining work and family life", "Fair treatment in employment", "Safe work environment", "Social protection", "Social dialogue and workplace relations".

According to data availability, we try to compute a simple indicator of decent work, easily understandable and which best approximates the ILO descriptions. We consider that a worker has a decent work if his/her work meets the following three criteria:

1. The worker should not be underemployed
2. The worker should be affiliated to a social security system
3. The worker should have a stable and secured employment

Underemployment is considered according to the ILO definition. A worker is classified as underemployed if he/she work less than 40 hours per week whereas he/she may wish to work more. This

concept is very important to better understand the functioning of the labor market in developing countries characterized by low unemployment rates and precarious jobs.

The affiliation to a social security system reflects the social protection aspect which is an important feature of decent work. Social security system in our data refers typically to pension fund or health care mutual.

A worker is considered to have a stable and secured employment if he/she has a permanent contract. Permanent contract indeed reflects a sense of stability since it limits frequent job changes and unstable labor incomes. We are aware however that permanent contract is not the only mean to have a stable job.

Robustness tests are performed on the decent work indicator in order to check if there is not a criterion which alone captures a significant variation of the impact on poverty.

Migration

We aim to consider only economic migration. To qualify a migrant as economic migrant we take into account two aspects: the age of the migrant and the reason of migration.

1. The migrant should be aged between 20 and 60 and should migrate for other reasons than health or study
2. To not account for students, we just include migrants aged between 25 and 60 among those who have migrated to pursue their study.

3.2 Descriptive Statistics

The annual household consumption per adult equivalent is about 390,800 CFA i.e. 590 euros. With the national poverty thresholds, 30% of households in my sample are considered as poor.

322 households (5.7%) have at least one member employed in a decent work, 5.2% have exactly one decent worker and very few have two decent workers or more (less than 0.6%).

319 households have at least one migrant, nearly the same proportion as households with decent workers (5.7%). Similarly very few have two migrants or more (0.6%).

We first drop in the analysis the 32 households that have both decent workers and migrants. We study in a second stage the impact of having both a migrant and a decent worker.

As shown in figure 1, the average annual consumption per adult equivalent in households with a decent worker is 1.6 time higher compared to migrant households and two times higher compared to households without decent worker and without migrant, hereafter referred to as control households. The difference of means between migrant households and control households is estimated at 90,429 CFA and is statistically significant. The difference between households with decent worker and migrants' households is about 286,520 CFA. Those differences are statistically significant at the 1% level.

Regarding the educational expenditure of children aged 6 to 16, households with decent worker spend four times more in children’s education compared to control households and 2.5 times more compared to migrant households. The overall average of annual educational expenditure of children aged 6 to 16 is about 12,451 CFA. The differences in educational expenditure between the three groups are statistically significant at the 1% level.

Figure 1: Household’s Annual Consumption

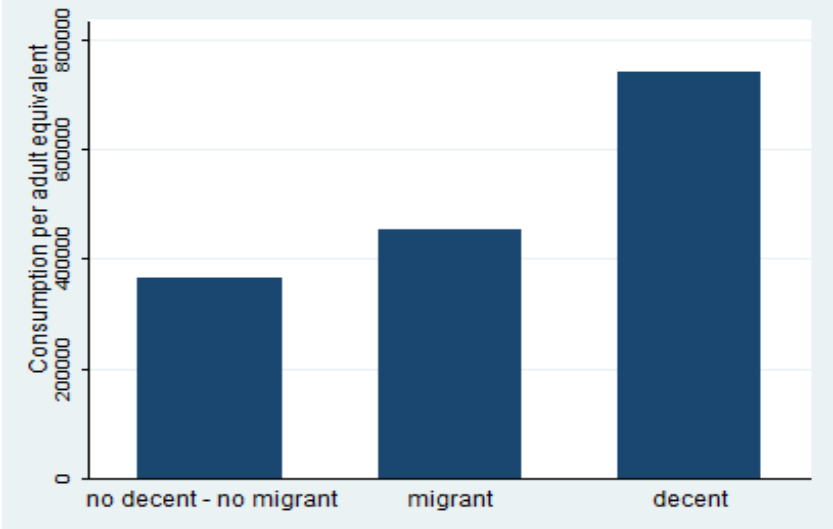
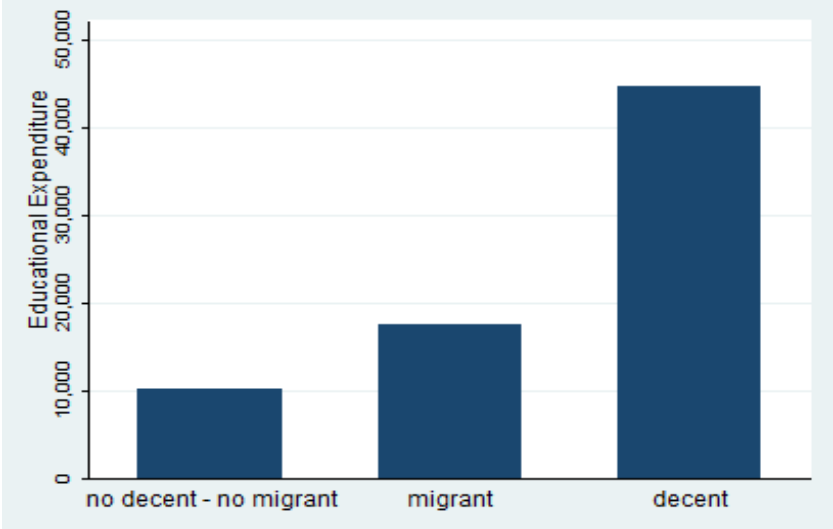


Figure 2: Educational Expenditure of children aged 6 to 16



Tables on descriptive statistics for other variables can be found on Appendix.

These large differences of consumption and educational expenditure between households with a decent worker and households with migrant do not definitely reflect the sole effect of access to a decent job. These households are different in some observable characteristics as shown in table

1 and maybe in terms of unobservable factors. Households with migrant live mostly in rural area than households with a decent worker. They have also larger household size, older household head and greater chances to be headed by a woman. Members of households with a decent worker are more literate and more educated than members of migrant households. These two households are not different in terms of internal transfers received.

To isolate the true effects of migration and access to a decent work, it is important to control for all these characteristics in the econometric framework and to find an appropriate identification strategy to deal with non-observable characteristics.

Table 1: Differences between households with decent worker and households with migrant

Variables	Decent work	Migrant	Difference
Urban	0.88	0.61	-0.28***
Household size	8.82	10.94	2.12***
Age of household head	50.54	54.57	4.03***
Household head female	19.88	39.19	19.31***
% of literate	0.81	0.51	-0.30***
% primary school degree or more	0.68	0.33	-0.36***
Internal Transfers received	317,080	256,728	60,352

4 Empirical Strategy

To capture the impact of access to decent employment and migration, we estimate the following equation:

$$Y_i = \alpha + \beta * D_i + \gamma * M_i + \lambda * X_i + \epsilon_i \quad (14)$$

Index i represent a household.

Y_i is an indicator of poverty. In most specifications it represents the logarithm of the annual consumption of the household per adult equivalent. In robustness analysis, we replace it by a binary variable taking 1 if the household is poor and 0 otherwise. In the second part of the empirical analysis, Y_i is the spending in education per child aged between 6 and 16.

D_i is a binary variable equal to 1 if the household has at least one person employed in a decent job and 0 otherwise. The previous subsection has described what is meant by a decent job. Considering a dummy variable is relevant since very few households (nearly 0.6%) have more than one person employed in a decent job.

M_i is a binary variable equal to 1 if the household has at least one migrant and 0 otherwise. Similarly only 0.7% of households have more than one migrant which led us to use a binary variable.

X_i is a vector of control variables at the household level susceptible to explain the household income. X_i contains: the residence area (urban vs rural), the number of children (less than 15), the number of adults (more than 15), the age and the sex of the household head, received transfers

from non-migrants, the proportion of literate adult household members, the proportion of adult household members with a primary school degree or more and finally dummies for ethnic groups and regions.

ϵ_i is an error term.

We estimate (1) using Ordinary Least Squares or Linear Probability Model if Y_i is the dummy poor or not.

The estimation of β and γ is likely to be biased and non-convergent since ϵ_i certainly contains non-observable susceptible to be correlated with both the interest variables D_i and M_i and the dependent variable Y_i . Thus we have $cov(\epsilon_i, D_i) \neq 0$ and $cov(\epsilon_i, M_i) \neq 0$.

It is possible in fact that households with persons employed in a decent job or with migrants are selected into some unobservable characteristics that may be motivation, ability, and personal relationships etc. creating and endogeneity bias in the estimation of β and γ . Endogeneity can also be due to the reverse causality between decent employment and poverty, and between migration and poverty. Indeed, poorer households are less likely to meet the necessary conditions to access decent jobs. And similarly, as migration requires high costs, poorer households have more difficulties to finance the migration of one of their household members.

4.1 Propensity score weighting

Basically we would like to evaluate the impact of two different programs in a non-experimental context: having a decent worker D_i and having a migrant M_i in the household i . Y_i is the observed outcome, the consumption per capita or the education expenditure per child. Given that there are two treatment variables which we wish to compare their effects, we rely on a propensity score weighting approach, a widely used strategy in a case of multi-valued treatments.

The first empirical strategy relies on the Marginal Mean Weighting through Stratification (MMWS). This method introduced by [Hong \(2010\)](#) combines and Inverse Probability Weighting Model (IPW) with a poststratification adjusted based on propensity score estimation.

Considering the general framework by [Rosenbaum & Rubin \(1983\)](#), denote Y_{id} the potential outcome if the household had one decent worker, Y_{im} the potential outcome if the household had one migrant, Y_{idm} the potential outcome if the household has both a decent worker and a migrant, and Y_{i0} the outcome if the household has no decent worker and no migrant. Let Y_{it} be the vector of these potential outcomes $Y_{it} = (Y_{i0}, Y_{id}, Y_{im}, Y_{idm})$ and T_{it} is a categorical variable that indicates the treatment category of household i , $t \in \{0, 1, 2, 3\}$. Thus, the average treatment effect of the treatment t is:

$$\Delta_{t0} = E(Y_{it} - Y_{i0}) \tag{15}$$

We are facing the classical missing-data problem in observational data because each household is observed only in one treatment. In addition for reasons mentioned above, the outcome variables

(consumption and education spending) are likely to be correlated with the treatment status. Following Rosenbaum & Rubin (1983) and the extension for multi-valued treatments by Imbens (2000), we rely on two assumptions:

1. The common support or overlap assumption: $P(T_{it}|X) > 0$ for all values of X suggesting that each household in a treatment group can have a comparable match in the control group.
2. The conditional independence assumption: conditioning on the propensity score which is the probability of receiving the treatment t , $P(T_{it}|X)$, the outcome and the treatment are orthogonal:

$$(Y_{it} \perp T_{it})|P(T_{it}|X)\forall t$$

Lacking data on pre-treatment characteristics, X stand for fixed variables that are variables not susceptible to be affected by the treatment T .

When these two assumptions are met then the average observed outcome of the control group can be a good proxy of the potential outcome of the treated households if they were not treated.

Identification can be achieved by weighting the observed outcome by the conditional probability of the given treatment:

$$E\left(\frac{Y_i T_{it}}{P(T_{it}|X)}\right) = E(Y_{it}) \tag{16}$$

Given this framework, we apply the Marginal Mean Weighting through Stratification (MMWS) method by following three steps.

1. We first estimate the propensity score for each treatment group. Given that the decisions to send a migrant or to get a decent job may be made simultaneously and thus correlated, we estimate jointly the probability of having a migrant and the probability of having a decent worker using a bivariate probit model. This model allows us to estimate a propensity score for each treatment status: decent work, migration and households with no decent work and no migrant. It is crucial in this estimation to use covariates not susceptible to be affected by migration or employment in a decent work. Same regressors listed in equation 14 are used for the two equations except that for the migration equation, we do not include the age and gender of the household head as they are probably correlated to the migration status¹.
2. Each of the three estimated propensity scores are then stratified into equal sized quantile categories. We use quintiles as they are more often used in the literature and are shown to reduce about 90% of the initial selection bias (Hong, 2010). The Marginal Mean Weight

¹When for example the true household head is the more likely to migrate

(MMW) is computed as follows:

$$MMW = \frac{n_{s_t} Prop(T = t)}{n_{T=t, s_t}} \quad (17)$$

n_{s_t} is the number of households in the stratum s_t . $Prop(T = t)$ is the proportion of households actually receiving the treatment t and $n_{T=t, s_t}$ is the number of households in the stratum s_t actually receiving the treatment t .

The basic advantage of this stratification is that, even when propensity scores are misspecified, the distribution of households between strata remain consistent and then the computed weights are robust.

3. These weights are finally used to estimate the outcome equation with a linear weighted least square regression. Each treatment is then compared to others. The Bonferroni correction is applied to adjust confidence intervals in order to take into account the multiple comparisons feature.

4.2 Instrumental Variable Strategy

We use an instrumental variable strategy to deal with these endogeneity problems. Proxies of network in labor market and network in migration are used as instruments. Lacking information about the true relationships between people, we approximate social network using geographical proximity and ethnic group.

The instrument for D_i is the proportion of other households (excluding household i) in the county and in the ethnic group which have at least a member employed in a decent job. Similarly, the instrument for M_i is the proportion of other households (excluding household i) in the county and in the ethnic group which have at least one migrant.

We name county the second administrative subdivision of Senegal ("département" in French) after the region. There are 45 counties in Senegal and the survey is representative at the county level. The number of households by county in our sample varies from 63 to 162. We can imagine that a given household is more likely to have a decent job if a high number of households in the same county have access to a decent job. The same reasoning applies for migration. So the instruments are very likely to be correlated with the interest variables D_i and M_i . Several studies in labor market emphasize the role of network in finding jobs (Montgomery, 1991; Calvo-Armengol & Jackson, 2004). Some use spatial interactions to capture the influence of these networks (Patacchini & Zenou, 2012; Bayer *et al.*, 2008). In migration also, many papers demonstrate the importance of network to overcome migration costs (Munshi, 2003; Bertoli, 2010; McKenzie & Rapoport, 2010).

To ensure the exogeneity of the instruments it is necessary to control for geographical factors and ethnic groups characteristics otherwise a high number of households with decent jobs or a high number of households with migrants can simply denote the fact that a given county or a given

ethnic group is richer or has some unobservable characteristics correlated with poverty. In this case the instrument affects directly the household's income.

We add regions and ethnic group fixed effects to strengthen the identification assumption. Still some geographic factors can weaken the exclusion restriction since regions are larger than counties. In fact Senegal has 14 regions and 45 counties in 2011 thus an average of three counties by region. Controlling by counties fixed effects will be too restrictive since counties and ethnic groups fixed effects will absorb a large variability of the instruments. So in addition to regions and ethnic groups fixed effects, we control for the average consumption in the county which is a good proxy of the county's wealth. However in some specifications, both counties and ethnic group fixed effects are included.

5 Results

The comparative impact of access to a decent work and migration on poverty is presented in a first subsection, the second subsection analyzes the comparative impact on investment in education, and some robustness analysis are presented in the last subsection.

5.1 Impact on poverty

Propensity score weighting method

Following the different steps detailed in the methodology, we use a bivariate probit model to estimate the joint probability of having a decent job and having a migrant. Results are shown in the appendix table [A3](#). Results show that the residence area affects only the probability to have a decent job. Residing in urban Dakar increases the probability to get a decent job but has no impact in the probability to migrate. The number of male adults in the household is positively related to the access to a decent job but negatively related to migration. Number of female adults increases both probabilities. The internal received transfers is negatively associated with migration but not significant regarding access to a decent work. The proportion of adults with primary school degree or more in the household is positively associated with both the probability of having a decent worker in the household and the probability of having a migrant. As shown in the bottom of the table, the error terms of the two equations are not significantly correlated suggesting that the decision to migrate or to have a decent work can be made independently.

Results of this estimation are used to predict these three propensity scores: having a decent worker in the household, having a migrant or not having neither a decent worker nor a migrant. The two former categories represent the two groups of treated households and the last category is the control group.

Weights are computed for each household using the marginal mean weighting through stratification method described in the methodology. We run then the outcome equation with a Weighted Least Square (WLS) to assess the impact of each treatment in the household consumption per adult equivalent. The sample is restricted to the region of common support. In all the specifications, having a decent worker in the household and having a migrant have positive effect significant at the 1% level on the household consumption per capita. The average treatment effect stands for 29.3% for employment in a decent work and 19.9% for migration. Table 2 compares ATEs between the three groups. While household consumption is significantly larger for decent workers' and migrants' households comparing to untreated households, there is no significant difference of the household consumption between households with migrant and households with decent worker.

Table 2: Comparing Average Treatment Effects on household consumption - Bonferroni correction

	ATE	Standard-error
decent work vs control group	0.293***	0.045
migrant vs control group	0.199***	0.037
migrant vs decent work	-0.094	0.058

* p<0.1, ** p<0.05, *** p<0.01

Instrumental Variable Strategy

We assess first the validity of the two instruments used to identify a causal effect of having access to a decent job and migration on poverty. Table 4 report results of a linear probability model for the first stage regressions with all control variables and fixed effects for ethnic groups and counties. Results show that the two instruments are highly correlated with their respective endogenous variables. Indeed, the proportion of other households in the county with the same ethnic group having at least one person employed in a decent job affects significantly, at the one percent level, the probability of having a decent job in the household. Similarly, the proportion of other households in the county with the same ethnic group having at least one migrant impacts significantly the probability to have a migrant. This picture shows that our instruments are good predictors of "decent households" and "migrant households" and therefore the identification strategy does not suffer from the weak instrument problem. In addition the Angrist-Pischke test of weak identification is reported in all estimation results and conclude that instruments are not weak.

Impact on household consumption

In the first set of results we compare the effect of decent job and migration on the annual household's log consumption per adult equivalent (table 5). We discuss below the relevance to use

Table 3: Impact on log total household consumption per capita-MMWS method

	1	2	3
	WLS	WLS	WLS
decent work	0.395*** (0.0620)	0.331*** (0.0510)	0.293*** (0.0454)
migrant	0.231*** (0.0513)	0.214*** (0.0384)	0.199*** (0.0371)
Zone (ref=Urban Dakar)			
Other Cities		-0.461*** (0.0282)	0.501*** (0.133)
Rural		-0.773*** (0.0324)	0.198 (0.132)
number of children		-0.0342*** (0.0034)	-0.0307*** (0.0030)
number of male adults		-0.0789*** (0.0057)	-0.0781*** (0.0054)
number of female adults		-0.0321*** (0.0055)	-0.0386*** (0.0053)
Age of Household Head		-0.0007 (0.0007)	-0.0006 (0.0006)
Household Head female		0.0314 (0.0209)	0.0287 (0.0198)
Log Internal Transfers		0.0050*** (0.0017)	0.0018 (0.00177)
% of literate		0.294*** (0.0413)	0.294*** (0.0411)
% primary school degree or more		0.203*** (0.0408)	0.346*** (0.0394)
Constant	12.62*** (0.0117)	13.35*** (0.0487)	12.75*** (0.150)
Ethnic group fixed effects	No	No	Yes
County fixed effects	No	No	Yes
No. of Observations	4383	4383	4383
R-Squared	0.0257	0.426	0.515
F	29.26***	228.5***	64.67***

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table 4: First stage regressions with all control variables and fixed effects

	(1)	(2)
	decent work	migration
Network decent work	0.295*** (0.072)	-0.056 (0.035)
Network migration	-0.096** (0.046)	0.291*** (0.075)
Ethnic group fixed effects	Yes	Yes
Region fixed effects	Yes	Yes
No. of Observations	5605	5605
R-squared	0.1464	0.0517
Angrist-Pischke F-test	14.37	12.91

this indicator as measure of poverty. In all specifications, the impact of decent job and migration is positive and significant at the 1% level (except in column 5 for migration) and the elasticity of decent job is always higher.

OLS estimation in column 1 with only the two interest variables indicates an elasticity of 70% for having a decent worker in the household and 25% for migration. In column 2 to 6, I implement a two-stage least squares estimation instrumenting decent job and migration using respectively proxies of network of access to decent work and network of migration. The two elasticities highly increase with the instrumental variable estimates in column 2. In the two first columns, the test of difference between the two variables is significant at the 1% level indicating that the impact of decent work in household's consumption is much higher than that of migration (p-value reported at the bottom of the table). In column 3, a set of controls are included. The elasticity of decent work highly decreases from 4.1 to 2.1 while the elasticity of migration increases. The test of difference is no longer significant. In column 4, dummies for ethnic groups and regions are added to strengthen our identification strategy. These dummies control for geographical factors and ethnic group features that can be correlated simultaneously with the instruments and household's consumption. The effects of decent work and migration are now quasi equal and the two elasticities remain positive and significant at the 1% level. In column 5, we replace regional dummies by counties fixed effects which are more disaggregated than regions. Since the two endogenous variables are predicted by the instruments constructed at the county level, controlling by ethnic groups and counties fixed effects can absorb a big part of the variability of decent work and migration related to household's consumption. Column 5 shows that the effects of migration are absorbed by the fixed effects whereas the elasticity of decent work increases slightly and remain significant at the 1% level.

Column 6 displays our preferred specification with a more parsimonious model. We replace counties fixed effects by regional fixed effects, and to ensure that the exclusion restriction is not violated, we control for the log average of consumption of households in the same county. This variable controls for the county's wealth which can affect simultaneously migration or decent work and consumption. Results show very similar impacts of decent work and migration on poverty. Having at least one person with access to decent work increases the household's consumption by 162%

which represents an annual increase of consumption of 479000 Fcfa (i.e 730 euros) for the median household. Having at least one migrant in the household increases the household's consumption by 159% meaning an annual increase of 470000 Fcfa for the median household about 717 euros. The magnitude of the two effects is very similar and quite high reflecting a huge impact of both migration and decent work on household's consumption. The size of these elasticities are quite different from the average treatment effect (ATE) estimated with the propensity score weighting method. This difference may not be disturbing since the two methods estimate different effects. While the weighting method estimate and ATE, the instrumental variable estimates can be interpreted as a Local Average Treatment Effect (LATE). Indeed the IV estimates reflect the impact of a decent work or migration for the households with high values of the instruments, which are households with a big network.

Regarding the control variables, living in rural area or in the other towns (out the capital) denotes surprisingly positive effects on consumption compared with living in the capital (urban Dakar). This effect is confounded by the inclusion of region fixed effects which are clearly highly correlated with the residence area. As shown in the other specifications dwelling in rural areas or other towns has negative effects on consumption. The size of the household has negative effect on consumption. One more child (less than 15) in the household reduces household consumption by 3.2%. The effect of an additional adult is larger. An additional adult male reduces consumption by 7.6% and additional female by 6.9%. The age of the household head and received transfers from other households inside the country have no significant effect on consumption. Households headed by women seem to be richer than those headed by men. Education plays an important role for the household well-being. A percentage point increase in the proportion of literate adult members in the household increase consumption by 14.1%. The average consumption of other households in the county is positive but not significant.

Impact on the living standard's index

In this section, we replace household consumption by some indicators that reflect the standard of living of the household using Multiple Correspondence Analysis (MCA). The indicators are constructed from dwelling characteristics and assets owned by the households. These characteristics are very likely to capture involvement of migrants in the household's standard of living as well as involvement of a decent worker present in the household. Indeed migrants, even if they do not reside in the household, may certainly invest in long run assets if they have the capacity to do so.

We construct three different indicators: an indicator of the housing characteristics, another for the owned assets and the last one is the aggregation of the two first indicators and reflect general standard of living of the household.

For the construction of the housing and the assets indicators, we firstly choose variables that discriminate poor and rich households. Variables that concern less than 1% of households are excluded from the analysis. Secondly we run a preliminary MCA and eliminate variables with smaller contributions in the formation of the first axis. Finally, selected variables for the housing index are:

Table 5: Impact on log total household consumption per capita

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	IV	IV	IV	IV	IV
Decent work	0.696*** (0.0413)	4.067*** (0.490)	2.103*** (0.569)	1.675*** (0.531)	2.308*** (0.832)	1.622*** (0.543)
migrant	0.249*** (0.0395)	1.338*** (0.442)	1.861*** (0.394)	1.664*** (0.563)	1.478 (1.199)	1.589*** (0.601)
Zone (ref=Urban Dakar)						
Other Cities			-0.329*** (0.0638)	0.506*** (0.114)	0.729*** (0.173)	0.503*** (0.114)
Rural			-0.568*** (0.0759)	0.278** (0.119)	0.505*** (0.186)	0.274** (0.119)
number of children			-0.0356*** (0.0040)	-0.0319*** (0.0037)	-0.0316*** (0.0039)	-0.0320*** (0.0036)
number of male adults			-0.0775*** (0.0076)	-0.0759*** (0.0070)	-0.0785*** (0.0088)	-0.0763*** (0.0070)
number of female adults			-0.0683*** (0.0103)	-0.0699*** (0.0119)	-0.0709*** (0.0208)	-0.0686*** (0.0125)
Age of Household Head			-0.0013 (0.0008)	-0.0010 (0.0008)	-0.0005 (0.0010)	-0.0010 (0.0008)
Household Head female			0.0835** (0.0370)	0.0563* (0.0329)	0.0972** (0.0478)	0.0564* (0.0321)
Log Internal Transfers			0.0092*** (0.0024)	0.0027 (0.0023)	0.0032 (0.0034)	0.0025 (0.0024)
% of literate			0.163*** (0.0435)	0.138*** (0.0432)	0.147*** (0.0518)	0.141*** (0.0432)
% primary school degree or more			-0.221* (0.134)	-0.00155 (0.132)	-0.137 (0.207)	0.0112 (0.135)
log average county's consumption						0.0529 (0.0870)
Ethnic group fixed effects	No	No	No	Yes	Yes	Yes
County fixed effects	No	No	No	No	Yes	No
Region fixed effects	No	No	No	Yes	No	Yes
Constant	12.56*** (0.00984)	12.30*** (0.0404)	13.28*** (0.0833)	13.37*** (0.0764)	12.45*** (0.252)	12.66*** (1.166)
No. of Observations	5605	5605	5605	5605	5605	5605
R-Squared	0.0557	-	-	0.1258	0.0061	0.1577
F	156.2***	36.13***	139.8***	74.08***	36.27***	75.03***
p-value test stable=migrant	0.0000	0.000	0.6860	0.9847	-	0.9541
Angrist-Pischke F-test for weak instruments (network decent work)	-	78.84***	20.28***	15.50***	9.28***	14.37***
Angrist-Pischke F-test for weak instruments (network migrant)	-	47.37***	37.42***	15.88***	2.63*	12.91***

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

type of housing, roof material, wall material, flooring material, water source, light source, type of toilet, access to internet and access to private TV channels. For computing the asset index, we use the following assets: ventilator, table, chair, wardrobe, bookcase, living room, phone, computer and fridge. The standard of living index is built with all the variables used for the housing and assets index.

In table 6, these indicators are considered as dependent variables in columns 1 to 3. Column 4 reports our preferred specification with all controls in column 6 of table 5 for comparison purpose. We run an IV estimates in all columns with all control variables and regions and ethnic groups fixed effects. Access to a decent job and migration have both a strong positive and significant effect for all the three indexes. The elasticity of decent job is lesser than that of migration for the housing index and higher for the asset's index but the difference between the two is not significant. Compared to the impact on consumption, decent job and migration seem to have higher effect on the standard of living index with respective elasticities of 233% and 272%. Results for control variables are almost the same than for previous results on consumption except the positive effect of internal transfers on the assets ownership and the general standard of living and positive effect of the average consumption in the county for the three indexes. These results show the importance of decent work and migration in improving the living conditions of households.

5.2 Impact on investment in education

Results in the previous sub-section have shown that access to a decent job has a similar impact on poverty than migration. This result may be surprising as gains from migration are usually documented to be very high and to raise the well-being of the migrant's origin household. An interesting research question is then to know through which mechanisms a decent work enhances the household's consumption and standard of living. Our assumption is that the security and the stability of work may allow people to invest more in economic activities and human capital formation. Indeed the stable nature of the job helps have a prospective approach and be more concerned about the well-being in the long run. In this section, we compare the effect of decent employment and migration on expenses in children's education. The dependent variable is now the logarithm of total expenditure for the education of children aged between 6 and 16 in the schooling year 2010-2011. In line with the theoretical framework, we expect a decent work to foster children's schooling while the impact of migration can be ambiguous.

Propensity score weighting method

The propensity score weighting strategy applied above is used to assess the comparative effect of a decent work and migration on the expenditure in children education in the household. We use the same weights computed previously to run a Weight Least Square (WLS) model. The outcome variable is now the education spending per child aged between 6 and 16 in the household. Results are

Table 6: Impact on household's standard of living's indicator

	(1)	(2)	(3)	(4)
	Housing	Assets	Standard of living	log consumption
Decent work	1.801*** (0.612)	2.704*** (0.837)	2.329*** (0.700)	1.622*** (0.543)
migrant	2.597*** (0.875)	2.654*** (0.961)	2.720*** (0.907)	1.589*** (0.601)
Zone (ref=Urban Dakar)				
Other Cities	0.805*** (0.0933)	1.030*** (0.145)	0.935*** (0.111)	0.503*** (0.114)
Rural	0.0918 (0.0998)	0.511*** (0.153)	0.259** (0.118)	0.274** (0.119)
number of children	-0.0005 (0.0048)	0.0014 (0.0057)	-0.00001 (0.0051)	-0.0320*** (0.0036)
number of male adults	-0.0131 (0.0099)	0.0196* (0.0116)	-0.0008 (0.0106)	-0.0763*** (0.0070)
number of female adults	0.0137 (0.0174)	0.0375* (0.0195)	0.0263 (0.0183)	-0.0686*** (0.0125)
Age of Household Head	0.00003 (0.0010)	-0.0007 (0.0012)	-0.000211 (0.0011)	-0.000981 (0.00075)
Household Head female	0.141*** (0.0436)	0.0961* (0.0521)	0.134*** (0.0468)	0.0564* (0.0321)
Log Internal Transfers	0.0034 (0.0033)	0.0105*** (0.0037)	0.0064* (0.0034)	0.0025 (0.0024)
% of literate	0.310*** (0.0542)	0.318*** (0.0636)	0.332*** (0.0568)	0.141*** (0.0432)
% primary school degree or more	0.112 (0.156)	0.0894 (0.210)	0.117 (0.177)	0.0112 (0.135)
log average county's consumption	0.680*** (0.117)	0.241* (0.131)	0.530*** (0.121)	0.0529 (0.0870)
Constant	-8.757*** (1.578)	-3.539** (1.755)	-6.979*** (1.630)	12.66*** (1.166)
Ethnic group fixed effects	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes
No. of Observations	5588	5582	5596	5605
R-Squared	0.247	-	0.159	0.158
F	149.2***	69.01***	123.8	75.03
p-value test stable=migrant	0.3054	0.9559	0.6347	0.9541
Angrist-Pischke F-test for weak instruments (network decent work)	14.49***	14.54***	14.39***	14.37***
Angrist-Pischke F-test for weak instruments (network migrant)	12.92***	13.14***	12.99***	12.91***

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

presented in table 8. As in the consumption estimates, the elasticities of having a decent work and having a migrant are both positive and statistically significant at the 1% level. But the impact seems higher compared to the impact on consumption. The average treatment effect of a decent work is about 66.3% and the average treatment effect for migration is about 32.9% and are all significantly higher compared to the control households. The Bonferroni correction test of comparison indicates that despite the ATE of a decent work is almost twice the ATE of migration, the difference between the two is not statistically significant as shown in table 7.

Table 7: Comparing Average Treatment Effects on educational expenditure - Bonferroni correction

	ATE	Standard-error
decent work vs control group	0.653***	0.150
migrant vs control group	0.329***	0.088
migrant vs decent work	-0.324	0.177

* p<0.1, ** p<0.05, *** p<0.01

Instrumental Variable Strategy

Results are presented in table 9. OLS estimation in column 1 shows significant effect of both migration and decent work but the effect of decent work is statistically higher. Instrumental variable estimates are recorded in column 2 to 4 using the same instruments as in the previous section. Control variables are included in column 3 and the average county's consumption and fixed effects are included in column 4. From column 2 to 4, migration has no significant effect in education spending whereas the effect of decent work remains positive and statistically significant at least at the 10% level in column 4. The impact is quite high. Belonging to a household with a decent worker enables to invest four times higher in children's education.

Results for control variables show negative effects for living in rural area and negative effects for the number of children. Households headed by a woman and households with a high proportion of literate members invest more in children's education.

These results show that a local decent job can be a good substitute of migration in reducing poverty and seems to be more effective than migration in promoting children's education. Even if in the definition of a decent job, I do not consider an income aspect, a decent job promotes stability in the household and allows household members to look to the future, to invest more in economic activities and in children's human capital.

Table 8: Impact on log total expenditure in education per child

	1	2	3
	WLS	WLS	WLS
decent work	0.807*** (0.219)	0.660*** (0.166)	0.653*** (0.150)
migrant	0.328*** (0.106)	0.306*** (0.0884)	0.329*** (0.0884)
Zone (ref=Urban Dakar)			
Other Cities		-1.030*** (0.0854)	-0.363 (0.283)
Rural		-1.414*** (0.0871)	-0.729*** (0.279)
number of children		-0.0477*** (0.0088)	-0.0430*** (0.0084)
number of male adults		-0.0131 (0.0138)	-0.0172 (0.0135)
number of female adults		0.0408*** (0.0135)	0.0412*** (0.0133)
Age of Household Head		0.0029 (0.0017)	0.0020 (0.0017)
Household Head male		0 (.)	0 (.)
Household Head female		0.130** (0.0612)	0.116** (0.0551)
Log Internal Transfers		0.0109** (0.0043)	0.0046 (0.0044)
% of literate		0.402*** (0.114)	0.339*** (0.114)
% primary school degree or more		0.882*** (0.0952)	0.930*** (0.101)
Constant	8.875*** (0.0236)	9.268*** (0.144)	8.516*** (0.330)
Ethnic group fixed effects	No	No	Yes
County fixed effects	No	No	Yes
No. of Observations	3043	3043	3043
R-Squared	0.0329	0.302	0.336
F	11.29***	88.10***	20.86***

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Table 9: Impact on educational expenditure

	(1)	(2)	(3)	(4)
	OLS	IV	IV	IV
Decent work	1.337*** (0.0769)	7.384*** (1.187)	3.159** (1.356)	3.248* (1.740)
migrant	0.322*** (0.0722)	1.065 (0.784)	0.848 (0.597)	1.633 (1.004)
Zone (ref=Urban Dakar)				
Other cities			-0.679*** (0.169)	-0.299 (0.296)
Rural			-0.991*** (0.205)	-0.585* (0.323)
number of children			-0.0445*** (0.0082)	-0.0400*** (0.0088)
number of male adults			-0.0177 (0.0144)	-0.0164 (0.0153)
number of female adults			0.00622 (0.0205)	-0.00883 (0.0283)
Age of Household Head			0.0022 (0.0016)	0.0014 (0.0018)
Household Head female			0.263*** (0.0789)	0.226*** (0.0866)
Log Internal Transfers			0.0102** (0.0045)	0.0065 (0.0053)
% of literate			0.276*** (0.0987)	0.220* (0.116)
% primary school degree or more			0.378 (0.279)	0.348 (0.366)
log average county's consumption				0.371* (0.199)
Ethnic group fixed effects	No	No	No	Yes
Region fixed effects	No	No	No	Yes
Constant	8.737*** (0.0205)	8.294*** (0.0989)	9.046*** (0.194)	4.081 (2.629)
No. of Observations	3839	3603	3603	3603
R-Squared	0.0782	-	0.0884	0.0372
F	162.8***	19.35	83.16	28.73
p-value test stable=migrant	0.0000	-	-	-
Angrist-Pischke F-test for weak instruments (network decent work)		42.94***	8.70***	5.34**
Angrist-Pischke F-test for weak instruments (network mi- grant)		41.30***	31.41***	10.53***

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Some empirical studies find evidence that a sense of stability in the family makes people invest more in children’s schooling and in human capital accumulation in general. [Atkin \(2009\)](#) finds in Mexico that women more likely to work in a factory job through an expansion of export manufacturing, have taller children. This effect does not go only through income but also through the expectations of these women about the future earnings opportunities of female children.

[Lien *et al.* \(2008\)](#) study the impact of housing environment on high school and college enrollment in Taiwan. Among a set of housing variables, they find that residential stability and homeownership yield larger positive impacts on teens’ schooling.

In rural Ethiopia and in a context where lands are not secured and people spend a large amount of time to ensure continuous access to the land, [Fors *et al.* \(2015\)](#) show that awarding a certificate that confirms individuals’ property rights to land, increases children school enrollment.

All these evidence demonstrate how the stability of the household, coming not necessarily from employment, helps household members to project into the future and invest more in children education.

5.3 Exploring the interaction effect

We are now interested in the interaction effect of the two treatments: decent work and migration. Are households which have both a decent worker and a migrant better off than other households which receive only one of the two treatments? This would suggest that the two treatments are complementary. If rather households with both a decent worker and a migrant are worse off than households with only one treatment, access to a decent work and migration are then substitutes. It is difficult in our data to properly estimate this presence of complementarity or substitutability effect between decent work and migration due to the very low sample of households which have the two, as shown in the descriptive statistics. Therefore these results should be considered with caution.

To measure this complementarity/substitutability effect, we modify slightly equation [14](#) and estimate rather:

$$Y_i = \alpha + \beta * D_i + \gamma * M_i + \delta * D_i * M_i + \lambda * X_i + \epsilon_i \tag{18}$$

In the propensity score weighting method, we add a third treatment group consisted of households with both treatments. We apply exactly the same methodology as before. The bivariate probit model in table [A3](#) allows us to estimate the propensity scores for each of the four groups. The weights are then derived and we estimate the different outcome equations using WLS. Summary of results are presented in table [10](#).

Regarding the consumption per capita, the results clearly show that there is any gain of having both a migrant and a decent worker in the household. The average treatment effects for households with both a migrant and a decent worker is not statistically different of the average treatment effect of a decent work only or migration only.

Regarding the educational expenditure, we have the same pattern, having both treatments yield any additional impact on investing in children education. However it is worth noting that in this specification, the average treatment effect for decent work is significantly higher than the average treatment effect for migration. In addition there is statistically no difference between the average treatment effect of migration compared to the control group. This particular result supports the finding with the instrumental variable strategy and raise doubts about the impact of migration on education spending.

Based on these results, there is neither complementarity nor substitutability between migration and access to a decent work.

Table 10: Comparing Average Treatment Effects with double treatment - Bonferroni correction

	Household consumption	Educational expenditure
decent work vs control group	0.248*** (0.039)	0.568*** (0.120)
migrant vs control group	0.231*** (0.036)	0.159 (0.098)
both vs control group	0.280 (0.139)	0.719* (0.275)
migrant vs decent work	-0.017 (0.051)	-0.409* (0.156)
Both vs decent work	0.032 (0.143)	0.151 (0.298)
Both vs migrant	0.049 (0.143)	0.560 (0.290)

Standard errors in parentheses
* p<0.1, ** p<0.05, *** p<0.01

5.4 Robustness checks

Some robustness analysis are presented in this section using the instrumental variable strategy.

Impact on poverty

We implement a number of robustness checks in table 11 to test whether the main results always hold. All results come from IV estimates with all the control variables and fixed effects.

In column 1, we use a dummy variable that takes 1 if household is poor and 0 if it is not poor. As explained previously, this measure may be more suitable in the analysis of poverty. Results in column 1 show that both access to decent job and migration reduce significantly poverty at the 1%

level. The effect of migration seems higher but the two coefficients are not statistically significant. This strongly confirms our main result that decent employment and migration have similar impact in reducing poverty.

In columns 2 to 4 we run some robustness analysis in the measure of decent employment. We use three alternative measures and for each we eliminate one of the three criteria keeping only two criteria. "Decent1" keeps the underemployment and the social security system criteria; "decent2" considers underemployment and having a permanent contract; "decent3" are for those who are affiliated in a social security system and have a permanent contract.

For the three alternative measures, results show significant positive impact of decent job in the consumption per adult equivalent and always statistically equal to the impact of migration. The elasticity for "decent1" is smaller and significant at the 10% level but is not statistically different from the effect of migration.

We restrict in column 5 migration to developed countries. In fact nearly 40% of migrants in our sample live in other African countries which are developing countries. This pattern tends to lower the net impact of migration on the living standards of the origin households.

So we restrict migration to European countries, the US and Canada what accounts for 60% of all migrant households and 4% of all households. Results show that the elasticity of decent employment remains almost the same as our baseline model but the elasticity of migration rises from 159% to 257%. Thus, migration to developed countries increases the impact of migration on household consumption but is not statistically different from the impact of a decent work. This is an interesting result as it shows that access to a decent work can be a good substitute of migration to developed countries.

Table 11: Heterogeneity and robustness checks

	(1)	(2)	(3)	(4)	(5)
	poverty	log consumption	log consumption	log consumption	log consumption
Decent work	-0.718** (0.342)				1.581*** (0.548)
migrant	-1.224** (0.528)	1.314** (0.658)	1.432*** (0.537)	1.938*** (0.739)	
decent1		0.727* (0.422)			
decent2			1.245*** (0.419)		
Migration developed countries				1.717*** (0.540)	
migrdev					2.567** (1.118)
Zone (ref=Urban Dakar)					
Other cities	-0.113** (0.0485)	0.465*** (0.110)	0.437*** (0.111)	0.428*** (0.109)	0.488*** (0.114)
Rural	-0.177*** (0.0530)	0.213* (0.115)	0.213* (0.114)	0.235** (0.114)	0.280** (0.121)
number of children	0.0192*** (0.0028)	-0.0330*** (0.0033)	-0.0326*** (0.0034)	-0.0334*** (0.0039)	-0.0326*** (0.00395)
number of male adults	0.0388*** (0.0056)	-0.0820*** (0.0068)	-0.0786*** (0.0065)	-0.0778*** (0.0077)	-0.0808*** (0.0072)
number of female adults	0.0410*** (0.0102)	-0.0626*** (0.0135)	-0.0644*** (0.0110)	-0.0716*** (0.0143)	-0.0694*** (0.0141)
Age of Household Head	0.00006 (0.0006)	-0.0014** (0.0007)	-0.0009 (0.0007)	-0.0006 (0.0008)	-0.0010 (0.0008)
Household Head female	-0.0185 (0.0250)	0.0310 (0.0263)	0.0476 (0.0300)	0.0678* (0.0352)	0.0352 (0.0398)
Log Internal Transfers	-0.0061*** (0.00187)	0.0026 (0.0026)	0.0027 (0.0022)	0.0041 (0.0028)	0.0049 (0.0034)
% of literate	-0.0711** (0.0315)	0.142*** (0.0476)	0.158*** (0.0403)	0.126*** (0.0480)	0.137*** (0.0459)
% primary school degree or more	0.0488 (0.0854)	0.193 (0.121)	0.0568 (0.120)	-0.184 (0.189)	-0.0134 (0.146)
log average county's consumption	-0.0274 (0.0703)	0.0533 (0.0946)	0.0646 (0.0811)	0.0505 (0.0954)	0.0599 (0.0926)
Ethnic group fixed effects	Yes	Yes	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes	Yes	Yes
Constant	0.483 (0.949)	12.74*** (1.263)	12.49*** (1.088)	12.72*** (1.284)	12.56*** (1.244)
No. of Observations	5605	5605	5605	5605	5605
R-Squared	0.1934	0.321	0.249	-	0.0343
F	28.99	97.50	86.91	63.27	64.37
p-value test stable=migrant	0.2851	0.2129	0.7211	0.6994	0.3201
Angrist-Pischke F-test					
for weak instruments (network decent work)	14.37***	19.39***	19.78***	16.25***	14.70***
Angrist-Pischke F-test					
for weak instruments (network migrant)	12.91***	11.60***	13.55***	11.05***	6.37***

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

Impact on investment in education

Some heterogeneity and robustness checks are presented in table 12. In column 1, migration is restricted to developed countries (Europe, US and Canada) and this time migration has a significant impact at the 10% level on educational expenditure and this effect is not significantly different to the effect of a decent work.

In column 2 and 3, robustness checks on the definition of migration are performed. Indeed, one possible explanation of the absence of effect of migration could be the fact that some migrants may live with their children abroad and in this case, their remittances are not firstly directed to children education. To rule out this hypothesis, we run a new regression in column 2 which restricts migration to migrant households which do not have an additional migrant less than 17 years old and for which the true migrant have gone for five years or less.² In column 3, we apply the same definition but restricting the duration of migration to three years or less. The idea behind this restriction is just to limit chances that the migrant lives with his children abroad. With a small duration of migration, the migrant is less likely to have the time to build a family abroad and to have children.

More than 90% of total migrants in our sample have migrated for five years or less and about 62% for three years or less. Nearly 7% of households have at least one child less than 17 years old living abroad.

Columns 2 and 3 of table 12 show that even for migrants less likely to live with their children abroad, migration has no significant impact on investment in children's education.

²Recall from the definition of migration on section 3.1, individuals living abroad but less than 20 years old are not considered as migrants

Table 12: Robustness and Heterogeneity on the Impact on educational expenditure

	(1)	(2)	(3)
	IV	IV	IV
	Migrant to rich countries	Migrant less 5 years	Migrant less 3 years
Decent work	3.146* (1.662)	3.049* (1.633)	3.196** (1.609)
Migrant	2.283* (1.342)	1.675 (1.210)	2.156 (1.933)
Zone (ref=Urban Dakar)			
Other cities	-0.315 (0.289)	-0.313 (0.290)	-0.298 (0.292)
Rural	-0.586* (0.318)	-0.603* (0.314)	-0.583* (0.313)
number of children	-0.0416*** (0.0087)	-0.0389*** (0.0088)	-0.0395*** (0.0093)
number of male adults	-0.0218 (0.0151)	-0.0196 (0.0149)	-0.0217 (0.0153)
number of female adults	-0.0066 (0.0263)	-0.0015 (0.0246)	0.0018 (0.0240)
Age of Household Head	0.0017 (0.0017)	0.0018 (0.0017)	0.00112 (0.0020)
Household Head Female	0.199** (0.0840)	0.233*** (0.0851)	0.256*** (0.0907)
Log Internal Transfers	0.0087 (0.0061)	0.00405 (0.0049)	0.00246 (0.0049)
% of literate	0.205* (0.118)	0.230** (0.116)	0.245** (0.114)
% primary school degree or more	0.352 (0.357)	0.401 (0.344)	0.340 (0.351)
log average county's consumption	0.346* (0.205)	0.445** (0.181)	0.466** (0.184)
[1em] Ethnic group fixed effects	Yes	Yes	Yes
Region fixed effects	Yes	Yes	Yes
Constant	4.430 (2.714)	3.089 (2.401)	2.813 (2.451)
No. of Observations	3603	3541	3481
R-Squared	0.0382	0.0776	0.0255
F	29.07	29.67	27.20
p-value test stable=migrant	0.5487	-	-
Angrist-Pischke F-test for weak instruments (network decent work)	5.53**	5.56**	6.17**
Angrist-Pischke F-test for weak instruments (network migrant)	6.64***	7.72***	4.98**

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01

6 Conclusion

This paper analyzes the impact of decent employment and migration on poverty and schooling for Senegalese households. We measure decent work through variables related to the stability of work and social protection and use different poverty indexes to conduct this study. Proxies of networks of migration and decent employment are used as instruments to control for self-selection bias. Results show that migration reduces poverty confirming the existing literature. But access to decent employment is as effective as migration to reduce poverty. Even if migration is restricted to developed countries, a local decent work has the same high impact than migration in increasing households' consumption and living conditions. This is an outstanding result, as in this context, people seem to overvalue the returns to migration, it is worth noting that a decent job provides the same benefit on the household's wealth.

One possible explanation is that a decent work allows people to have a forward-looking behavior, to think more about their future and to invest more in their family members' human capital and well-being in general. We test this hypothesis and find therefore that while migration has no significant impact in educational spending, except for migration to developed countries, a decent work significantly increases households' expenditure in children education.

In terms of policies, this study follows the recommendation from several studies on the impact of migration about the reduction in the cost of sending remittances which may have important impacts on the origin households' well-being. But the main recommendation to be drawn from this study is the necessity to create decent jobs and to facilitate their access to a large majority of people. For that, it seems important to foster industrial development and to boost the high-quality services sectors to absorb the bulk of working poor in the agricultural and informal sector. Promoting social protection and security at work should certainly be in the forefront of policies dedicated to further decent jobs. Finally, investing in the relevant education and vocational training is fundamental since skills and education seem to be one of the major determinants of access to decent employment.

References

- Acosta, Pablo, Calderon, Cesar, Fajnzylber, Pablo, & Lopez, Humberto. 2008. What is the impact of international remittances on poverty and inequality in Latin America? *World Development*, **36**(1), 89–114.
- Alcaraz, Carlo, Chiquiar, Daniel, & Salcedo, Alejandrina. 2012. Remittances, schooling, and child labor in Mexico. *Journal of Development Economics*, **97**(1), 156–165.
- Anker, Richard, Chernyshev, Igor, Egger, Philippe, Mehran, Farhad, & Ritter, Joseph A. 2003. Measuring decent work with statistical indicators. *International Labour Review*, **142**(2), 147–178.
- ANSD. 2013. *Situation Economique et Sociale du Sénégal en 2011, version définitive*. Dakar, Sénégal.
- ANSD. 2016. *Situation Economique et Sociale du Sénégal en 2013, version définitive*. Dakar, Sénégal.
- Antman, Francisca M. 2011. The intergenerational effects of paternal migration on schooling and work: What can we learn from children’s time allocations? *Journal of Development Economics*, **96**(2), 200–208.
- Atkin, David. 2009. Working for the future: Female factory work and child health in Mexico. *Unpublished Manuscript, Yale University*.
- Banerjee, Abhijit, & Duflo, Esther. 2012. *Poor economics: A radical rethinking of the way to fight global poverty*. PublicAffairs.
- Barham, Bradford, & Boucher, Stephen. 1998. Migration, remittances, and inequality: estimating the net effects of migration on income distribution. *Journal of Development Economics*, **55**(2), 307–331.
- Bayer, Patrick, Ross, Stephen L, & Topa, Giorgio. 2008. Place of Work and Place of Residence: Informal Hiring Networks and Labor Market Outcomes. *Journal of Political Economy*, **116**(6), 1150–1196.
- Bertoli, Simone. 2010. Networks, sorting and self-selection of Ecuadorian migrants. *Annals of Economics and Statistics*, 261–288.
- Calvo-Armengol, Antoni, & Jackson, Matthew O. 2004. The effects of social networks on employment and inequality. *American Economic Review*, 426–454.

- Cazes, Sandrine, & Verick, Sher. 2013. *Perspectives on labour economics for development*. International Labour Organization.
- Chiwuzulum Odozi, John, Taiwo Awoyemi, Timothy, & Omonona, Bolarin Titus. 2010. Household poverty and inequality: the implication of migrants' remittances in Nigeria. *Journal of Economic Policy Reform*, **13**(2), 191–199.
- Dustmann, Christian, & Glitz, Albrecht. 2011. Migration and education. *Handbook of the Economics of Education*, **4**, 327–439.
- Ernst, Christoph, & Berg, Janine. 2009. The role of employment and labour markets in the fight against poverty. *International Labour Organization*.
- Fors, Heather Congdon, Hounbedji, Kenneth, & Lindskog, Annika. 2015. *Land Certification and Schooling in Rural Ethiopia*. PSE Working Papers 2015-30.
- Gubert, Flore, Lassourd, Thomas, & Mesplé-Somps, Sandrine. 2010. Transferts de fonds des migrants, pauvreté et inégalités au Mali. *Revue Économique*, **61**(6), 1023–1050.
- Gupta, Sanjeev, Pattillo, Catherine A, & Wagh, Smita. 2009. Effect of remittances on poverty and financial development in Sub-Saharan Africa. *World Development*, **37**(1), 104–115.
- Gutierrez, Catalina, Orecchia, Carlo, Paci, Pierella, & Serneels, Pieter M. 2007. Does Employment Generation really matter for poverty reduction? *World Bank Policy Research Working Paper Series, Vol.*
- Hong, Guanglei. 2010. Marginal mean weighting through stratification: adjustment for selection bias in multilevel data. *Journal of Educational and Behavioral Statistics*, **35**(5), 499–531.
- ILO, International Labor Organization. 1999. *Decent Work: Report of the Director General*. International Labour Conference, 87th Session.
- Imai, Katsushi S, Gaiha, Raghav, Ali, Abdilahi, & Kaicker, Nidhi. 2014. Remittances, growth and poverty: New evidence from Asian countries. *Journal of Policy Modeling*, **36**(3), 524–538.
- Imbens, Guido W. 2000. The role of the propensity score in estimating dose-response functions. *Biometrika*, **87**(3), 706–710.
- Lachaud, Jean-Pierre. 1999. Envois de fonds, inégalité et pauvreté au Burkina Faso. *Revue Tiers Monde*, 793–827.
- Lien, Hsien-Ming, Wu, Wen-Chieh, & Lin, Chu-Chia. 2008. New evidence on the link between housing environment and children's educational attainments. *Journal of Urban Economics*, **64**(2), 408–421.

- Margolis, David N, Miotti, Luis, Mouhoud, El Mouhoub, & Oudinet, Joel. 2015. "To Have and Have Not": International Migration, Poverty, and Inequality in Algeria. *The Scandinavian Journal of Economics*, **117**(2), 650–685.
- Mbaye, Linguère Mously. 2014. "Barcelona or die": understanding illegal migration from Senegal. *IZA Journal of Migration*, **3**(1), 1–19.
- McKenzie, David, & Rapoport, Hillel. 2010. Self-selection patterns in Mexico-US migration: the role of migration networks. *The Review of Economics and Statistics*, **92**(4), 811–821.
- McKenzie, David, & Rapoport, Hillel. 2011. Can migration reduce educational attainment? Evidence from Mexico. *Journal of Population Economics*, **24**(4), 1331–1358.
- Montgomery, James D. 1991. Social networks and labor-market outcomes: Toward an economic analysis. *The American economic review*, **81**(5), 1408–1418.
- Munshi, Kaivan. 2003. Networks in the modern economy: Mexican migrants in the US labor market. *The Quarterly Journal of Economics*, 549–599.
- Patacchini, Eleonora, & Zenou, Yves. 2012. Ethnic networks and employment outcomes. *Regional Science and Urban Economics*, **42**(6), 938–949.
- Ravallion, Martin. 1992. Poverty: A guide to concepts and methods. *World Bank. LSMS Working Paper*, **88**.
- Rosenbaum, Paul R, & Rubin, Donald B. 1983. The central role of the propensity score in observational studies for causal effects. *Biometrika*, **70**(1), 41–55.
- Ruhm, Christopher J. 2004. Parental employment and child cognitive development. *Journal of Human Resources*, **39**(1), 155–192.
- Schildberg-Hoerisch, Hannah. 2011. Does parental employment affect children's educational attainment? *Economics of Education Review*, **30**(6), 1456–1467.
- WorldBank. 2015. *Migration and Development Brief*. Tech. rept. 24. World Bank, Washington, DC.
- Yang, Dean. 2008. International migration, remittances and household investment: Evidence from Philippine migrants' exchange rate shocks. *The Economic Journal*, **118**(528), 591–630.

Appendices

Table A1: Descriptive Statistics: quantitative variables

Variable	Number of observations	Mean	Std. Dev.	Min	Max
annual household consumption	5605	390796	357171	11998.16	5628477
annual household annual expenditure	4650	12451.21	30783.15	0	475500
number of children	5605	4.080285	3.377505	0	43
number of male adults	5605	2.341481	1.764731	0	15
number of female adults	5605	2.850847	2.017558	0	16
Age of Household Head	5605	51.65263	14.51963	17	99
Internal Transfers	5605	201709.1	511802.6	0	9425000
% of literate members	5605	0.4793103	.3274984	0	1
% primary school degree or more	5605	0.2700764	.3099557	0	1

Table A2: Descriptive Statistics: categorical variables

Variable	Number of observations	Mean
poverty	5605	0.2978
decent work	5605	0.0574
migrant	5605	0.05691
Household Head female	5605	0.2516
Zone		
Urban Dakar	5605	0.0905
Other cities	5605	0.4240
Rural	5605	0.4855

Table A3: Bivariate probit estimation of the joint decision of migration and access to decent work

	(1)	(2)
	decent work	migration
Zone (ref=Urban Dakar)		
Other Cities	-0.481*** (0.0852)	0.146 (0.106)
Rural	-0.864*** (0.109)	0.00849 (0.115)
number of children	-0.00559 (0.0136)	-0.00904 (0.0101)
number of male adults	0.0503** (0.0208)	-0.0547*** (0.0182)
number of female adults	0.0583*** (0.0209)	0.143*** (0.0164)
Age of Household Head	-0.00465* (0.00267)	
Household Head female	-0.394*** (0.0840)	
Log Internal Transfers	0.00422 (0.00610)	-0.0214*** (0.00509)
% of literate	0.761*** (0.183)	0.0510 (0.131)
% primary school degree or more	1.487*** (0.147)	0.324** (0.136)
Constant	-2.166*** (0.202)	-1.919*** (0.135)
athrho	-2.769 (36.21)	-2.769 (36.21)
No. of Observations		5605
chi2		646.6***
Wald test rho=0		0.0058

Standard errors in parentheses

* p<0.1, ** p<0.05, *** p<0.01