# Migrant's Networks as a Basis for Social Control : Remittances Obligations and Strategic Behavior among Senegalese in France[*]

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**Abstract**

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# 1  Introduction

The economic literature provides much evidence of a positive impact of social networks and capital on economic outcomes through a reduction of transaction costs, access to and exchange of information, etc. In particular, social capital has been found to facilitate access to the labor market (Aguilera, 2002; Drever and Hoffmeister, 2008) and to improve wages and/or occupational status (see, e.g. Aguilera, 2005; Lin,1999). For immigrants, social capital is especially important, as relying on social networks is a way to reduce job search costs, for example in the presence of discrimination (Mouw, 2002). Migrants networks have also been found to provide shelter and assistance to freshly arrived migrants (e.g. Munshi 2003, Granovetter 1995). In the case of Senegalese migrants in France, recent survey data collected in 2009 through the MIDDAS project show that upon arrival, respectively 71% and 50.4% of the migrants found a place to live and a job thanks to family members, friends from origin or destination countries or migrants' associations. Data also suggest that those migrants who found their first job by themselves stayed unemployed for a longer period.

In addition to supplying information and assistance upon arrival, migrants' networks have also been found to provide insurance to their members in times of hardship. Using data on Ghanaian migrants in the Netherlands, Mazzucatto (2007) explores how migrant transnational networks are related to migrants' ability to have secure employment, secure housing and to be able to resolve crisis situations (a marriage deal gone wrong, being imprisoned, losing a job, the funeral of a family member, etc.). She finds that Netherlands-based migrants' networks are fundamental in helping migrants address crises, especially those requiring financial assistance. Additional evidence is provided by Menjivar (2002) who find that Guatemalan immigrant women in Los Angeles who do not have access to formal health care tend to resort to "alternative" methods to get treatments, in which friends, family, neighbors and acquaintances are key actors.

Yet, it is generally acknowledged that there is a dark side of social capital as well.

A migrant is generally involved in networks that are usually composed of kin, friends or fellow villagers who are in a position to put specific pressure on him, especially with regard to his remittance behavior. Migrants are indeed expected to remain closely connected with their origin country and the sending of money or goods to those who have been left behind is often considered as their "duty". These "remittance obligations" might result either from an informal insurance arrangement between the migrants and their families, as hypothesized by Stark (see, e.g. Stark 1991), or from prevailing solidarity or egalitarian norms which require that wealthier people should transfer to poorer ones. In this perspective, the residential concentration of migrants, while being often related to the organization of the migration itself, may form a basis for social control: continuing interpersonal relationships established with other co-ethnics may indeed act as a constant reminder to the migrants of their obligations and duties to their families back home. One mechanism through which social control operates to induce migrants to meet their obligations is through the spread of information. Indeed, as information travels easily through migrants' networks, the news of any misbehavior may be quickly communicated not only among migrants but also back to the home country. Information on misbehavior may also flow from origin households to network members in the destination country. By so doing, origin households are able to exert a strong control over the migrants' resources. Given all the services provided by the network, the fear of being ostracized by family and friends and being left with no support system could well prevent migrants from reneging on their obligations.

Despite a growing literature on the motives for remittances, very few papers have investigated the impact of migrants' networks on migrants' remitting behavior. Exception includes Philpoot (1968) who argues that social control with regard to remittance obligations is largely rooted in migrants' networks in the case of Montserratian migrants in Britain.

In this paper, we analyze whether social capital related to family members, kin, friends or fellow villagers in the destination country influences the degree to which migrants

meet the expectations of those they have left behind. We first develop a simple model of remittance behavior in which networks are assumed to induce migrants to meet their remittance obligations both through an insurance effect and an information effect. We thus depart from existing models of motives for remitting which generally do not account for the close-knit networks migrants are embedded in. We then use an original data set covering Senegalese migrants residing in France to test the main predictions of our model.

The remainder of the paper is organized as follows. Section 1 propose a bargaining model for remittances. Section 2 presents and describes the data. Section 3 tests the main predictions of the model. Section 4 concludes.

# 2    A Bargaining Model for Remittances

## 2.1    Basic Settings

A typology of theoretical models of the motives for remitting is provided by Rapoport and Docquier (2006). The model we present here borrows characteristics from existing models (see discussion below) but differs in that it intends to account for the impact of migrant's networks on migrants' remitting behaviors within a simplified bargaining framework under incomplete information. Remittances are assumed to be subject to a bargaining-like process between the migrant and his origin household, which is supported by anecdotal evidence (see for example Dia (2009)).

In our model, like in altruistic models, the motives for remitting are considered regardless of the decision to migrate. The bargaining model includes some insurance, but in a different way from classic insurance models where insurance stems from the migrant to the household. These models are best fitted to agricultural societies, in which households' income is mainly derived from agricultural activity subject to wheather hazard. On the opposite, we argue that migration is the risky activity which has been increasingly the case for example for undocumented migrants in European countries implementing restrictive immigration policies. The migrant will thus have higher insurance needs than

the household. Unlike classic insurance models, insurance is not provided directly by the household to the migrant but through the mediation of migrant networks.

The provision of insurance by migrant networks has been much documented (REF). As regards Senegalese migrants, evidence of networks-based insurance mechanisms can be found for example in case studies by Mboup (2001) or Elia (2006). Moreover, recent nationally representative household data permitted to show that Senegalese international migration do seem to strongly rely on migrant networks (Chort, 2010)). But besides providing assistance to newcomers in destination countries or valuable information [1] to their relatives or co-villagers contemplating emigration, migrant networks create connections between different places in Senegal and in the destination countries. They function as a diaspora communication media, spreading information but also rumors. The impact of the development of information and communication technologies (for example cellular phones are now used everywhere in Senegal) on the diffusion of rumor is for example studied in Dia (2007).

Because of their central position in a still much patriarchal society, households have a supposedly great influence on networks materializing the "multi-located village" (Dia, 2009). Using their ability to manipulate rumors spread through networks, households may exert social control over migrants. Taking into account the prevalence of social norms and much demonstrated solidarity values in the Senegalese society, households' control may be exerted on migrants' resources. Migrants in that context are faced with the obligation to comply with their origin household's claim over their income, because of the credible threat to have their reputation ruined and thus be ostracized. Given the large amount of services networks can provide to the migrant, ostracism can indeed be an effective punishment for deviant individuals.

Thus, in an environment structured by strong social norms, where networks are both information media and insurance devices, households can be shown to exert a strong control over migrants' resources. This control is expected to be even tighter when the

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[1]For example on job opportunities or ways to deal with authorities

network is more efficient (both in providing insurance and relaying information and rumors) and when the migrant has a greater need of network's insurance, which is formally shown in the theoretical model presented below. Another key element in our theoretical model which has not been evoked yet is information asymmetry: in our model the household is granted much power but not omniscience. Migrants' income is not observable to the origin household, although it may be proxied using network-based information (more details below).

A note on bargaining models[2]: Here the bargaining problem is a much simplified one: a two players-game (one migrant and her origin household), where each player can make one offer. The household plays first. The first player's offer can be accepted or refused. If accepted, the game ends. If refused, the second player makes another offer in turn. Whatever the first player's response game ends. If the second player's offer is refused, player two is punished, whereas player one still receives the offered amount. The game has been designed to best describe the mixture of social norms and individual behaviors involved in remittances: open bargaining on the part of the migrant would be socially punished since it would be seen as a will to escape from family obligations. On the other hand, the irreversibility of the migrant's offer is due to the nature of the offer (money transfer).

## 2.2   The model

We consider two agents: one migrant and one household. Remittances are subject to a bargaining process between the origin household and the migrant which we describe as a one period finite game: the household plays first and claims a given amount of remittances. Then, the migrant's play consists in either sending an amount inferior or equal to the claimed amount or sending nothing. Payment occurs then: if the household

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[2]Rubinstein's definition of bargaining problems is the following: "Two individuals have before them several possible contractual agreements. Both have interests in reaching agreement but their interests are not entirely identical. What "will be" the agreed contract assuming that both parties behave rationally" ? (Rubinsein, 1982)

is satisfied with the received amount, no punishment occurs in the subsequent period. If the household is dissatisfied, then punishment occurs. Punishment consists in using the network to diffuse negative rumor on the migrant and thus ostracizing him and depriving him of any assistance on the part of the network. Household's satisfaction depends on its reservation transfer, which is not known by the migrant. If the received amount is inferior to the reservation transfer expected by the household, then punishment occurs. Punishment is assumed to have no cost for the household and is further assumed to last only one period. If the migrant is punished, he is not able to use networks resources during one period. The household's objective is to obtain the highest amounts of remittances (cash transfers) over a single period horizon, whereas the migrant tries to arbitrate between the cost of transfers and the threat of the punishment if the household is dissatisfied with the amounts received. Indeed the migrant maximizes her income over two periods. The second period income depends on the positive probability for the migrant to be unemployed, the amount of insurance provided by the network in the bad state of nature (unemployment) and the probability not to be punished (and thus having access to networks' resources). Note that in the bad state of the world (migrant is unemployed in period 2), it is assumed that the bargaining over remittances will not occur (the household will not make any claim, knowing that the migrant will not be able to pay), even though the network insurance device works (even though the migrant receives a share of his previous income from the network, that is, the case where no punishment occurred in the previous period).

It could be objected that (too) much (extortion) power is granted to the household since it is assumed to have the ability to punish deviant behaviors of the other agent without any cost. Nonetheless, the credibility of the household's threat relies on the existence of a network and the migrant's need for insurance. The migrant's need for insurance is taken into account by the fact that he might be unemployed in each period with a probability q. The household tries to obtain the highest amounts of remittances (cash transfers) whereas the migrant tries to arbitrate between the cost of transfers and

the threat of the punishment if the household is dissatisfied with the amounts received.

The household strategy is thus to ask the higher amount that the migrant can accept depending on her income. Actually, we assume that the migrant's income is not observable to the household. The household must base its computation on an estimation of the migrant's income. Denote $\overline{T_h}$, the amount of transfer claimed by the household, $T_m$ the amount of transfer effectively sent by the migrant, $\tilde{Y}_m$, the household's estimation of migrant's income, $\alpha$ the network's size normalized so that $0 < \alpha < 1$, $q$, $0 < q < 1$ the probability for the migrant to be unemployed. $\alpha$ and $q$ are known with certainty by both agents.

The amount of transfer claimed by the household depends on the migrant's estimated income and on parameters determining the opportunity cost of the punishment : network size and migrant probability to be unemployed[3].

The migrant maximizes her utility over two period: in the first period her income is exogenous and given by $Y_m$. In period 2, if the migrant is still employed, her income is the first period income. If the migrant is unemployed in period 2, the insurance mechanism provided by the network is the following: in the bad state of nature (unemployment) occurring with a probability $q$, $0 < q < 1$, the migrant is provided assistance by the network, a monetary equivalent of which being a share of its previous income, $\alpha Y_m$, with $0 < \alpha < 1$, $\alpha$ being the normalized network size. In period 2, the migrant thus receives $Y_m$ if employed and $\alpha Y_m$ if unemployed and insured by the network.

Migrant's expected utility is the following : (assumed to be the same for all migrants and additively separable).

$$\text{Max} \quad E(V_m) = \nu(Y_m - T_m) + (1 - q)\nu(Y_m) + q\pi(T_m)\nu(\alpha Y_m) \tag{2.1}$$

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[3]The model could be made more complex by introducing household and migrant's risk-aversion parameters, a discount factor indicating preference for the present, some degree of altruism on the part of one or both agents. Or less demanding than altruism, the migrant's utility may be made dependent on household's consumption level

With $\nu' > 0$ and $\nu'' < 0$ since the migrant is assumed to be risk-averse, and $\pi = 1 - p$, $p$ being the probability to be punished. $\pi(T_m)$ increases in $T_m$.

In order to determine the maximal amount the migrant is likely to transfer the household maximizes the migrant's expected utility with respect to transfer $T_m$ replacing $Y_m$ by its own estimate $\tilde{Y}_m$ in equation 2.1.

The first order condition is given by:

$$-\nu'(\tilde{Y}_m - T) + q\pi'(T)\nu(\alpha\tilde{Y}_m) = 0 \qquad (2.2)$$

The household claim $\overline{T_h}$ is obtained by solving equation 2.2 with $T = \overline{T_h}$.

A simple punishment scheme can be defined: Assume that it is common knowledge that the household's reservation transfer $\underline{T_h}$ follows a uniform law on the interval $(0, \overline{T_h})$. The higher the transfer, the lower the probability to be punished, but this probability is strictly positive unless the transfer sent by the migrant equals the amount claimed by the household. The probability for the migrant to be punished is given by $\Pr(T_m > \underline{T_h})$. Since $\pi(T_m) = 1 - p(T_m)$, $\pi(T_m) = \frac{T_m}{\overline{T_h}}$.

Moreover, if we use a simple utility function $\nu(.) = \ln(.)$, the first order condition can be written:

$$-\frac{1}{\tilde{Y}_m - T_m} + q\frac{1}{\overline{T_h}}\ln(\alpha\tilde{Y}_m) = 0 \qquad (2.3)$$

Household computation of the "response" function of the migrant $\tilde{T}_m$ is thus the following :

$$\tilde{T}_m = \tilde{Y}_m - \frac{\overline{T_h}}{q(\ln(\alpha) + \ln(\tilde{Y}_m))} \qquad (2.4)$$

But whereas $\overline{T_h}$ is exogenous for the migrant, the household's objective is to set it at the level that maximizes the transfer it receives. The household thus chooses $\overline{T_h}$ so that

it verifies :

$$\overline{T_h} = \tilde{Y}_m - \frac{\overline{T_h}}{q(\ln(\alpha) + \ln(\tilde{Y}_m))} \tag{2.5}$$

Equation 2.5 gives:

$$\overline{T_h} = \frac{\tilde{Y}_m}{1 + \frac{1}{q(\ln(\alpha)+\ln(\tilde{Y}_m))}} \tag{2.6}$$

$\overline{T_h}$ increases with the estimated income of the migrant $\tilde{Y}_m$, and with the opportunity cost of the punishment, depending on both the probability for the migrant to be unemployed $q$ and the amount of insurance provided by the network, that was aboved assumed to be equal to the normalized network size $\alpha$.

Given $\overline{T_h}$, the migrant's problem is to maximize $E(V_m)$. Basing on equations 2.1 and 2.4, the migrant's response function is:

$$T_m = Y_m - \frac{\overline{T_h}}{q(\ln(\alpha) + \ln(Y_m))} \tag{2.7}$$

From the migrant's viewpoint, $\overline{T_h}$ is exogenous and the transfer sent $T_m$ increases with the migrant's income $Y_m$, the probability $q$ to be unemployed in period 2, and the network size $\alpha$, but decreases with the amount claimed by the household $\overline{T_h}$. The intuition for the latter prediction is the following: for a given income and opportunity cost of deviation, the higher the claimed amount, the higher the probability that the remitted amount fall below the household punishment threshold. As a consequence, the value of the transfer in terms of utility becomes lower, and the remitted amount will be lower than would be with a lower initial claim.

So, under all previous assumptions (and in particular the assumption that the punishment scheme is common knowledge) the household obtains the maximal amount of transfer when its estimate of migrant's income is the true value of the migrant's income. The key point is the fact that the household has only incomplete information on the true

income of the migrant.

The migrant's interest is to buy insurance at the lowest cost, that is to remit less and face a lower probability to be punished. This objective can be attained if the household underestimate the migrant's income. The migrant's strategic behavior will then consist in trying to keep private information on his income so that the household think he is poorer than he really is. Two elements are to be taken into account :

First, the migrant's ability to conceal a part of her income to the household can be assumed decrease with the network size $\alpha$ (since the larger the network, the more information about the migrant is available).

Second, the household's proxy for the migrant's income can be manipulated by the migrant himself, depending on his income allocation. Indeed, some allocations reveal more about the true income of the migrant than others. In particular, investment is (at least partly) observable, whereas bank savings, for example, are not. Denote $\lambda$ the share of migrant's income allocated to "visible" investment such as productive investment in Senegal or real estate investment (as opposed to the share of income saved on a bank account). Household's estimate of migrant's income is thus increasing in $\lambda$.

$\tilde{Y}_m$ can thus be written:

$$\tilde{Y}_m = \alpha \lambda Y_m \tag{2.8}$$

with $Y_m$ being the true value of the migrant's income.

The main predictions of the model can be summarized as follows :

1. Remittances are independent of household's income and/or assets. Indeed, household income is not taken into account in the model: household claims (extortion-like) depend only on migrant's ability to pay.

2. Remittances are expected to increase with different measures of the network's size, density, efficiency in providing insurance

3. Remittances are expected to increase with the migrant's probability to be in need of networks resources (probability to be unemployed)

4. Remittances are expected to increase with the share of migrant's income that is invested (as opposed to the share of her income she saves)

5. Remittances are expected to increase with the migrant's true income

Comparing our predictions to the summary presented by Rapoport and Docquier (2006), prediction 5 is shared by all individual or familial motives for remittances but (classic) insurance. Prediction 1 is a remarkable prediction of our model since all other models predict that remittances are sensitive to at least one component of the household's income (long run or short run) or household's assets. Predictions 2 and 3 are specific to our model since migrant-directed insurance and the double impact of networks have not been accounted for in remittances models before ours. Indeed networks are expected to have a positive impact on remittances both through an insurance effect and an information effect. On the one hand, the larger the network, the higher the amount of insurance it can provide, the higher the opportunity cost of punishment for the migrant and thus the higher the amount remitted. On the other hand, the larger the network, the larger the amount of information circulating, the more difficult for the migrant to conceal his true income. Prediction 4 is also a remarkable of our model since existing models did not consider the allocation of migrant's income. This prediction is linked to information asymmetries and the migrant's strategic behavior.

# 3   Data and Summary Statistics

We focus on Senegalese migrants that have been contacted in France and Italy through the MIDDAS project. Respectively 300 Senegalese migrants in France and 300 Senegalese migrants in Italy have been interviewed over the year 2009 using common sampling methodology and questionnaire. Detailed information of the migrants' personal networks

in France and Italy has been recorded together with data on remittances sent to the origin household and home community, savings, investment projects and migrants' individual characteristics[4].

## 3.1  Sampling Method

Any attempt to carry out a specialized survey of migrants faces the problems that international migration is generally a rare event and that no survey frame is available[5]. To mitigate these two problems, we applied the same survey method as the one adopted by Lydié, Guilbert and Sliman in their survey on Sub-Saharan Africans in Greater Paris (Lydié et al., 2007). We first used the most recent population censuses in France and Italy to select regions and districts. To this end, we stratified the database into three strata depending on the density of the Senegalese population in each district and randomly selected districts within each stratum with probability proportional to the number of Senegalese migrants in those districts. We then defined the number of migrants to be surveyed in each selected district based on the relative weight of each district in the total Senegalese population[6]. We finally sent surveyors in all the selected districts and asked them to intercept Senegalese in various crossing points/places (markets or shopping centers, post offices, bus terminals, etc.). To be eligible, the interviewees had to meet three criteria: being aged 18 or more; residing in the district; and either being a Senegalese national or a former Senegalese national. In addition to fill in a given number of questionnaires, surveyors were also asked to record as much information as possible on those Senegalese migrants who refused to be interviewed. Overall, 579 Senegalese migrants were approached in France, among which 300 accepted to be interviewed. If one excludes the sex variable (women were more reluctant than men to be interviewed), no significant

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[4]In the current version of the paper, only the data on Senegalese migrants in France are used. Italian data will be added in the next version of the paper.

[5]For a detailed discussion on the difficulties raised by migrant surveys and a comparison of the performance of alternative survey methods, the interested reader should refer to McKenzie and Mistiaen (2007)

[6]Further details on the sampling methodology can be provided by the authors upon request

difference can be found in terms of age distribution and date of arrival between those who accepted and those who refused to be part of the study.

## 3.2  Sample Composition and Migrants' Main Characterisitics

Summary statistics on the migrants' characteristics are given in Table 1. Because men are over-represented among Senegalese in France with an estimated ratio of 1.4 man for 1 woman according to the last census and because women were more reluctant than men to be part of our study, the sample is strongly biased in favor of males. By contrast, the age distribution is close to the one obtained when one computes census data on Sub-Saharan Africans in France, with a clear under-representation of people at retirement ages and a concomitant over-representation of people of working age. With regards to educational attainment, Senegalese in our sample appear much less educated on average than the total French population, with a distribution by diploma that is here again close to the one observed on the whole immigrant population. Senegalese are indeed clearly over-represented among low-educated people (with either no diploma or PSLCE) and under-represented among highly-educated people. Interestingly enough, the great majority of migrants in our sample who attended formal school also attended Koranic school for a few years, suggesting that both school careers are considered as relevant educational choices by Senegalese households. This result is actually in line with what Andre and Demonsant (2009) find in their study on the Senegalese education system. Last, migrants in our sample mainly come from Dakar, the capital city of Senegal (48.7%) or from areas located along the Senegal River, namely Saint-Louis, Matam and Tambacounda. However, when the migrants' date of departure is accounted for, other regions of Senegal are found to be on the rise with regards to migration to France, with newcomers increasingly coming from Thies and Diourbel and other areas that are part of the Senegalese Groundnut Basin.

Table 2 presents few descriptive statistics on the situation of our sample migrants in France. What the data suggest is that the picture of migration flows mainly made up by young and single male workers who live together in *foyers* may be partly true, but that

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it only reflects part of the picture. Nearly 35% of those migrants who were interviewed actually co-reside in France with their spouse and/or children, and an additional 26% co-reside with other relatives or friends. Given the size of their household, they are 71% to live "independently" in a flat or a house.

## 3.3   Migrants' Labour Market Performances

Given the age distribution of the migrants in our sample, most of them are either employed or looking for a job (Table 3). With an unemployment rate of 14.3%, they are found to be as exposed to unemployment as immigrants originating from other countries. Among those who are "regularly" employed, either on a full-time or on a part-time basis, the share of wage-workers is close to the national average. However, the share of wage-workers with a permanent contract is much lower (53.5%) than the one computed by the French national Statistical Institute on the whole population in 2007 (77.7%) (INSEE, 2007). The share of wage-workers with either fixed-term contracts, interim contracts or even no formal contracts is consequently much higher in our sample, which suggests that Senegalese migrants are much more likely to get precarious employment than the rest of the active population. With regards to their socioeconomic classification, Senegalese with a regular employment are found to be strongly concentrated in unskilled or low-qualified jobs: 37.4% have lower technical occupations (against 24.8% for the whole active population) and 39.3% have lower services, sales or clerical occupations (against 28.8% for the whole active population). Senegalese are thus concentrated in the lower part of the income distribution, with a median income among those being regularly employed at 1,200 euros per month (the same figure for the whole employed population in France is around 1,682 euros according to INSEE estimates).

## 3.4    Migrants' Networks and Networks' Service Position

The MIDDAS survey provides detailed information on each migrant's social capital. The questionnaire was designed so as to account for the fact that social capital in France can take different forms (family networks, hometown associations, etc.) and that each of these has potential to affect the migrants' behavior in a different way. Family networks are measured by the number of relatives that are in France and the strength of the network gauged by whether or not and how frequently the migrant has contacts with his relatives. Survey results show that 64.4% of the migrants in our sample had a relative in France at the time they migrated. At the time they were interviewed, 31.3% declared that other members of their origin household were currently residing in France, in other households.

Social capital with hometown members can be seen in the existence of social, religious, cultural or even sports associations composed of fellow hometown members. 25% of the migrants in our sample belong to at least one association, and 14% to a hometown-based or community based organization. In addition, 15% of the surveyed migrants participate to a rotating savings and credit association (ROSCA). Last, when asked to give the names and details of the persons they trust and regularly interact with, migrants in our sample cited between 2 and 3 persons on average.

Table 4 provides insights on the type of financial and non financial support received by migrants from their networks' members. Support to find a job or a place to live is acknowledged by a majority of migrants: 52% declare that they were helped by their family to find a housing at the time they arrived in France and 14% still relied on their family to find their current housing. In terms of job access, the support provided by other Senegalese has been key for 25% of the migrants at the time they arrived in France, and 14% found their current job thanks to Senegalese acquaintances. Financial support from the family and members of the Senegalese community in France in times of hardship is also recognized by a majority of our sample migrants: 57% of those who encountered periods of unemployment in the past said they received support from family

and Senegalese. There is thus strong evidence of the insurance function of migrants' networks in our data.

## 3.5 Migrants' Remitting Behavior

As reported in Table 5, a remarkable feature of the migration pattern is the high proportion of remitters among Senegalese migrants. 83.3% of them said they sent remittances either in cash or in kind to Senegal in the twelve months preceding the survey, a proportion that is slightly higher for men (85.9%) than for women (75.3%). Remittances sent to the origin household amount to 1,600 euros on average and to 1,914euros when the sample is restricted to remitters only, which suggests a contribution of 160 euros per migrant per month. Interestingly enough, there is no clear evidence of a correlation between the amount of remittances sent by the migrants and the perceived wealth of their origin households. While altruistic models of remittances would predict higher amounts of remittances to poorer origin households, simple descriptive statistics using our data do not bring support to this assumption. Most migrants use money transfer services to remit funds to their origin country, and most of them remit funds on a regular and frequent basis.

In order to investigate whether the provision of information and services by the network influence the remittance behavior of our sample migrants, we now turn to a multivariate analysis of remittances determinants.

# 4 Regression Analysis of Remitting Behavior

To empirically explore whether our data bring support to the main predictions of our model, we estimate a model of remitting behavior where remitting behavior is measured in two ways: (1) as a binary indicator of whether a migrant remits or not ; and (2) as annual remittances to the origin household (in log) which includes zeros for those migrants who do not remit. Our aim through these regressions is to test whether the

remitting behavior varies between migrants depending on how dependent they are from the provision of services and insurance by family, friends and other acquaintances in the destination country and on how efficient the network is in providing services and insurance and in spreading information.

More precisely, prediction 1 of the model is tested through the inclusion of variables measuring the level of income and/or assets of the origin household. To this end, we computed a composite score for wealth based on various variables relating to the living conditions of the origin household using a multiple correspondence analysis. The size of the origin household and the number of international migrants in the origin household are also included to control for the origin household' needs. Our assumption is that these variables should not be strong determinants of the migrant's remitting behavior.

Prediction 2 is tested through the inclusion of several variables: a dummy variable taking the value 1 if the migrant is a member of an association, be it a hometown association or not (0 otherwise); the size and composition of the migrant's network of friends; and a dummy for whether the migrant benefited from the support of family, friends or other acquaintances to find a job and a housing at the time he arrived in France (0 otherwise). The bigger the size of the network and the stronger the support provided in the past, the higher the cost of deviating from the redistributive norm, the stronger the incentive of the migrant to meet his remittances obligations.

Prediction 3 of the model is tested through the inclusion of two variables in the set of regressors: a dummy variable taking the value 1 if the migrant encountered periods of unemployment in the past (0 otherwise); and a dummy variable taking the value 1 if the migrant declared to be "regularly" employed, either with a full-time or a part-time job, at the time of the survey (0 otherwise). We expect the first one to have a positive and significant impact on the probability to remit and/or the amount of remittances sent while the second one is expected to reduce the incentive of the migrant to meet his remittances obligations.

Prediction 4 is tested through the inclusion of two variables: a dummy for whether

the migrant has invested in the origin community (0 otherwise), which, as argued in the model, acts as a signal of wealth to the origin household; and a dummy for whether the migrant regularly saves part of his income (0 otherwise).

Last, prediction 5 of the model is tested trough the inclusion of the migrant's observed income.

With our dataset, we are also able to control for a number of other individual characteristics which have generally been found to influence remitting behavior in the literature. These include the demographic characteristics of the migrant (sex, age, educational attainment), the length of time spent abroad and the presence of family abroad (household size in the destination country).

Tables 6 and 7 presents the results of these regressions (comments to be added).

# 5 Conclusion

To be added

# 6 References

To be added

**Table 1 - Migrants' main characteristics**

|  | % |
|---|---|
| Male | 75,7 |
| *Age* | |
| 18-25 years | 11,0 |
| 25-35 years | 35,7 |
| 35-45 years | 28,3 |
| 45-60 years | 22,0 |
| 60-75 years | 3,0 |
| *Education level* | |
| No schooling | 20,3 |
| Elementary school | 15,0 |
| Middle school | 15,3 |
| High school | 14,3 |
| Vocational | 9,7 |
| University | 25,3 |
| *Last grade completed* | |
| None | 31,3 |
| CEP (or PSLCE) | 16,0 |
| BEPC | 8,7 |
| CAP/BEP | 1,3 |
| Bac/brevet | 19,0 |
| Undergraduate | 6,0 |
| University, graduate | 17,7 |
| *Type of schooling* | |
| None | 2,7 |
| Koranic | 15,3 |
| Formal | 17,3 |
| Both Koranic and Formal | 64,7 |
| *Region of origin* | |
| Dakar | 48,7 |
| Thies | 7,7 |
| Diourbel | 2,3 |
| Fatick | 1,0 |
| Kaolack | 2,7 |
| Louga | 0,7 |
| Saint-Louis | 2,0 |
| Matam | 6,0 |
| Ziguinchor | 6,0 |
| Kolda | 3,3 |
| Tambacounda | 16,0 |
| Other country | 1,7 |
| Unknown | 2,0 |
| Number of observations | 300 |

Source: MIDDAS Survey, 2009

**Table 2 - Migrants' situation in France**

|  | % |
| --- | --- |
| *Place of residence in France* |  |
| Paris | 44,3 |
| Greater Paris (excl. Inner city) | 28,0 |
| Other regions | 27,7 |
| *Type of household in France* |  |
| Alone | 39,3 |
| With spouse and/or children | 34,7 |
| With other relatives or friends | 26,0 |
| *Household size in France* |  |
| 1 | 39,3 |
| 2 | 25,3 |
| 3 | 13,3 |
| 4 | 7,3 |
| 5 | 5,0 |
| More than 5 | 9,7 |
| *Date of arrival in France* |  |
| Born in France or arrived before the age of 15 | 9,3 |
| Arrived before 1990 | 21,0 |
| Arrived between 1990 and 2000 | 23,7 |
| Arrived after 2000 | 46,0 |
| *Type of accomodation in France* |  |
| House | 4,0 |
| Flat | 67,3 |
| Foyer | 21,0 |
| Room | 3,3 |
| Workers' hostel | 3,0 |
| Other | 1,3 |

Source: MIDDAS Survey, 2009

**Table 3 - Migrants' labor status and income**

|  | % |
| --- | --- |
| *Labour status (n = 300)* | |
| Regularly employed | 73,0 |
| Occasionnally employed | 4,0 |
| Unemployed | 14,3 |
| Inactive | 6,3 |
| Other | 2,3 |
| | |
| *Wage/Non-wage status among those who are permanently employed (n = 219)* | |
| Non-waged workers | 14,3 |
| Waged workers | 85,7 |
| Permanent contract | 53,5 |
| Fixed-term contract | 16,6 |
| Temporary work/interim | 9,7 |
| Apprenticeship contract | 1,8 |
| Informal contract/No contract | 3,7 |
| Unknow | 0,5 |
| | |
| *Socioeconomic classification of those who are permanently employed (n = 219)* | |
| Small employers and self-employed occupations (excluding agriculture) | 3,7 |
| Large employers, higher grade professional, adm. and managerial occupations | 6,8 |
| Intermediate occupations | 8,7 |
| Lower services, sales and clerical occupations | 39,3 |
| Lower technical occupations | 37,4 |
| Unknown | 4,1 |
| | |
| *(Monthly) labor income categories for those who are permanently employed (n = 219)* | |
| Less than 500 euros | 3,2 |
| 500 to 1000 euros | 22,4 |
| 1000 to 1250 euros | 26,5 |
| 1250 to 1500 euros | 17,8 |
| 1500 to 2000 euros | 17,8 |
| 2000 to 2500 euros | 4,6 |
| 2500 to 3000 euros | 0,5 |
| 3000 to 5000 euros | 2,7 |
| 5000 to 8000 euros | 0,5 |
| Unknown | 4,1 |

Source: MIDDAS Survey, 2009

**Table 4 - Sources of non financial and financial support received by migrants**

| | No support | Support from… Social services[*] | Family | Senegalese non relatives | Friends in France | Other | Unknown | Total |
|---|---|---|---|---|---|---|---|---|
| *Access to housing* | | | | | | | | |
| How did you find a housing at the time you arrived in France? | 11,0 | 0,0 | 51,7 | 14,0 | 5,0 | 13,0 | 5,3 | 100,0 |
| How did you find your current housing? | 26,0 | 9,7 | 14,3 | 18,0 | 16,0 | 7,3 | 8,7 | 100,0 |
| | | | | | | | | |
| *Access to job* | | | | | | | | |
| How did you get a job at the time you arrived in France? (n = 244) | 13,1 | 7,4 | 13,1 | 25,4 | 11,9 | 19,3 | 9,8 | 100,0 |
| How did you get your current job? (n = 219) | 26,5 | 11,9 | 7,8 | 13,7 | 11,0 | 11,9 | 17,4 | 100,0 |
| | | | | | | | | |
| *Financial support during unemployment periods* | | | | | | | | |
| When you were unemployed, who did you get support from? (n=136) | 33,8 | - | 39,7 | 16,9 | 7,4 | 0,0 | 2,21 | 100,0 |
| Since you are unemployed, who have you got support from? (n=43) | 32,6 | - | 34,9 | 9,3 | 9,3 | 7,0 | 7,0 | 100,0 |

[*] Include national and local public employment agencies

Source: MIDDAS Survey, 2009

**Table 5 - Remittance behavior**

|  | All migrants (n = 300) | Remitters only (n = 250) |
|---|---|---|
| Total amount remitted in cash to the origin household (in €) | 1595 | 1914 |
|  | (1 915) | (1 948) |
| Total amount remitted in cash or kind to the origin household (in €) | 1640 | 1968 |
|  | (1 957) | (1 988) |
| Total amount remitted in cash, to any household (in €) | 1730 | 2076 |
|  | (2 015) | (2 038) |
| Total amount remitted in cash or kind, to any household (in €) | 1777 | 2133 |
|  | (2 057) | (2 078) |
| Total amount remitted in cash or kind to the origin household depending on origin household's perceived wealth (in €) |  |  |
| Origin household is rich (n = 53) | 1485 |  |
|  | (2 060) |  |
| Origin household is neither rich nor poor (n = 187) | 1760 |  |
|  | (1 966) |  |
| Origin household is poor (n = 47) | 1574 |  |
|  | (1 900) |  |
| Wealth of origin household not declared (n = 13) | 775 |  |
|  | (1 460) |  |
| "*Which channel do you use to send remittances?* [(*)]" (%) |  |  |
| Money transfer services | 65,9 |  |
| Bank | 1,3 |  |
| Post office | 6,2 |  |
| Hand-to-hand | 9,0 |  |
| Fax/telephone | 8,2 |  |
| Other informal channels | 6,7 |  |
| Other | 0,3 |  |
| Unknown | 2,6 |  |
| "*How frequently do you send remittances?* [(*)]" (%) |  |  |
| Annually | 0,5 |  |
| Quarterly | 4,4 |  |
| Every 2 months | 7,2 |  |
| Monthly | 49,0 |  |
| Irregularly | 39,0 |  |

Note: Reference period is last 12 months. Standard deviations in brackets

[(*)] Given that a same migrant may send remittances to several persons and that the frequency and channels used to send remittances may vary according to the identity of the recipient, the question was asked for each recipient. Figures are thus computed on 390 observations.

Source: MIDDAS Survey, 2009

**Table 6 - Regression Results**

| | Probit | Tobit |
|---|---|---|
| **Migrant's characteristics** | | |
| Male | 0.111 | -0.068 |
| | (0.320) | (0.541) |
| Age | 0.127 | 0.235* |
| | (0.081) | (0.140) |
| Age squared | -0.001 | -0.003 |
| | (0.001) | (0.002) |
| Soninke | 0.438 | 1.046* |
| | (0.394) | (0.543) |
| Koranic schooling (years) | 0.135*** | 0.114** |
| | (0.045) | (0.052) |
| Dummies for educational attainment | *(included but not shown)* | |
| Size of household | -0.058 | 0.097 |
| | (0.082) | (0.128) |
| Migration duration (years) | -0.024 | -0.042 |
| | (0.019) | (0.032) |
| Household income (log) | 0.135** | 0.465*** |
| | (0.063) | (0.063) |
| Permanent occupation | -0.104 | -0.257 |
| | (0.409) | (0.693) |
| Has been unemployed once since arrival | 0.741** | 0.946* |
| | (0.353) | (0.510) |
| Investment in Senegal | 1.637*** | 1.134** |
| | (0.633) | (0.506) |
| Regular savings | 0.746** | 0.967** |
| | (0.326) | (0.456) |
| **Origin Household's characteristics** | | |
| Size of origin household | -0.008 | -0.022 |
| | (0.012) | (0.020) |
| Housing score | 0.102 | 0.266 |
| | (0.143) | (0.224) |
| Number of members abroad | -0.028* | -0.051 |
| | (0.017) | (0.033) |
| **Network's variables** | | |
| Member of any assocation | 0.833* | 0.139 |
| | (0.480) | (0.529) |
| Has received help from family or senegalese acquaintances | -0.008 | 1.564* |
| | (0.586) | (0.813) |
| **Constant** | -3.265 | -3.248 |
| | (1.678) | (2.908) |
| **Observations** | **276** | **276** |

(Note : Coefficient estimates, standard errors in parenthesis)

\*\*\* p<0.001   \*\*p<0.05   \*p<0.1