Remittances and Return Migration*

William Collier
University of Kent

Matloob Piracha
University of Kent, IZA and GLO

Teresa Randazzo
University of Bari

Abstract

This paper utilises survey data of return migrants to analyse the determinants of remittances sent while the migrants were abroad. We approach our research question from the perspective of three sending countries in the Maghreb, namely Algeria, Morocco and Tunisia. We investigate the remittance behaviour using the migrants' conditions before migration as well as during the migration experience. Using a two-part model, we show that the decision to remit and the amount remitted depend on a combination of different migrant characteristics and reasons for migration as well as the duration and form of migration. More importantly, we also consider if the remittance behaviour is dependent on the type of return: 'decided' or 'compelled'. We show that the two groups have different incentives to remit which can help explain the link between type of migrants and their remittance behaviour.

Corresponding author:

Matloob Piracha
School of Economics
Keynes College
University of Kent
Canterbury, Kent CT2 7NP
United Kingdom
Email: M.E.Piracha@kent.ac.uk
Tel: +44 1227 827029
Fax: +44 1227 827850

* We would like to thank Sylvain Bard, Alan Carruth and Ken Clark for their comments on an earlier draft. The usual disclaimer applies.

1. Introduction

The economic implications of migration for sending and receiving countries vary widely. Receiving countries may experience an infusion of cheap labour into the economy with consequent impacts on wage and job availability. For sending countries, emigration seems to have even a larger impact. On the one hand, home countries may suffer from "brain drain" while on the other hand, benefits of emigration may be identified via unemployment alleviation, human capital accumulation (as a result of return migration), and, arguably most importantly, the inflow of remittances.

Recent data reveals that remittance flows to developing countries have more than tripled over the past decade. Following a fall to $305 billion in 2009, the World Bank estimates that remittances reached a little over $400 billion in 2012, and are expected to reach $479 billion by 2017.[1] Furthermore, the World Bank underlines that the volume of these private transfers could possibly be at least 50 percent more than what the available data suggests.

Understanding the conditions that affect the remittance pattern of migrants is important to contextualise the net benefits of migration. The motivations that generate these flows of income may vary from supporting the family at home to buying a property or realizing other investment projects.[2] Moreover, in the case of temporary migration, remittances may generate entrepreneurial opportunities upon return and help overcome the credit constraints that individuals may face in the origin country.

The growing importance of these income transfers has produced numerous studies, which have not only investigated the impact of remittances on growth and development in the origin countries but also the possible motivations to remit. Nevertheless, there is still no consensus as to what motivates migrants to remit, especially when migration can take different forms (e.g. temporary, permanent, circular). For instance, there might be a reduction in the remittance flows of those who intend to stay in the destination country permanently as their family moves with them or joins them in the destination country and as the links with the home country diminish over time. However, if the motive to remit is to secure a share in future bequest by the parent then these flows can last for a very long time (Lucas and Stark

[1] http://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationDevelopmentBrief20.pdf and https://siteresources.worldbank.org/INTPROSPECTS/Resources/334934-1288990760745/MigrationandDevelopmentBrief24.pdf

[2] Remittances may also represent an additional income source used to alleviate family poverty, to finance children's education, to afford better health care and/or to offer a safety resource for the family in times of financial hardship.

1985, Hoddinott 1994, de la Brière *et al*. 2002). Nevertheless, migrants who intend to return to the home country are more likely to remit regularly, and possibly for different objectives than those who migrate permanently.[3] Dustmann and Mestres (2010), for example, argue that temporary migrants are likely to remit more as their family members stay in the home country instead of joining them in the destination country. In addition, remittances may be affected by the insurance motive as temporary migrants consider the readjustment cost upon return and seek (extended) family assistance in this regard. Finally, they find that the more likely a migrant is to return, the higher the probability of remitting for investment purposes.

Most papers that discuss temporary migration do so using intentions to return as a proof of actual return. However, intentions do not necessarily convert into actions and only if migrants have actually returned to the home country is it reasonable to argue that their remittances while in the destination country were based on their 'true' intentions, at that time, to return (see Lu, 1999).[4] Accordingly, our analysis in this paper focuses on return migrants and considers how different individual and household characteristics as well as different forms of temporary migration − return after only one migration episode versus circular migration − affect the remittance behaviour of return-migrants, while they were still living abroad. In addition, because of the interesting nature of the data set, we are able to highlight differences in remitting behaviour by type of return: 'decided' or 'compelled'. Migrants who decide or choose to return home may exhibit different remittance behaviour to those who were forced to interrupt the migration experience. We investigate if any significant differences between the two groups of returnees exist in the determinants of remittances.

Our empirical analysis is based on a cross-sectional dataset collected in 2006/2007 in the context of the *Migration de Retour au Maghreb* (MIREM) project. This unique data set provides a rich source of information concerning migrant behaviour for three Maghreb countries: Algeria, Morocco and Tunisia. These have traditionally been migrant sending countries with a long history of out migration and high remittance flows,[5] and yet there is limited research on this region within the migration literature. To our knowledge, this paper is the first empirical study on remittance motivations using this dataset, which, despite its

[3] See Rapoport and Docquier (2006) for a review of the theoretical literature regarding the motivations for remittances.

[4] One downside of using a dataset that is based on remittance behaviour of migrants who have already returned to the home country is that it can generate recall bias. As some migrants might have returned some time ago, they may not recall their remittance behaviour prior to returning to the country of origin. We acknowledge the shortcoming but believe that this kind of data could still provide some interesting insights into the remittance behaviour of return migrants.

[5] In 2010, for instance, Moroccan remittances were estimated to be around $6.4 billion and around $2.0 billion for each of Algeria and Tunisia (World Bank, 2011).

shortcomings, provides valuable insight into the remittance behaviour of return migrants while they were still abroad.

One of the key shortcomings of the MIREM data is that the sample suffers from selection issues as it is not representative of the migrant population. However, it contains important information discussed above and therefore the analysis could contribute to the literature on the determinants of remittances from the perspective of those who have actually returned to the home country. Return migrants are very important in promoting development through remittances, norms, social practices and ideas about management, skills and access to capital (Anghel *et al.*, 2015). To our knowledge, no other data set on remittance behaviour uses information from the actual returnees.

Our strategy consists in separating the probability (extensive margin) and the level (intensive margin) of remittances. Our results show that the differences in remittances among different return migrants to the Maghreb region can be explained by a combination of household and migrant observed characteristics. Furthermore, we find that some important factors which affect the decision to remit do not explain the amount remitted and vice versa. For example, education and labour force status affect the probability to remit but they are not significant in explaining the amount remitted. Also, entering illegally in the host country − the type of information not available in most of the datasets − positively affects the level of remittances. Since in our setup the return is actually realised, those interviewed state their legal/illegal status in the host country, as it is a retrospective question. In regards to the type of return, we find that some household and individual characteristics affect the remittance behaviour of decided and compelled returnees in different ways. We provide some intuition for our results.

The remainder of the paper is organized as follows. Section 2 summarizes how migration has evolved in the Maghreb region. Section 3 provides a description of the data set used in the paper. Sections 4 and 5, respectively, discuss the empirical methodology and estimation results. Concluding remarks are presented in Section 6.

2. Migration Trend and Remittance Flows in the Maghreb

Western Europe represents the main destination region of the Maghreb migration flows followed by the oil producing Arab countries. For historical reasons, France has attracted the majority of the Maghreb community abroad, followed by Spain and Italy. The OECD reports that France received a flow of 22,315 Algerians, 19,214 Moroccans and 7,854

Tunisians in 2008 while Spain received a higher flow of migrants from Morocco (93,623) in the same period.[6]

Since the post-colonial period, migration in the Euro-Mediterranean region has been characterized by different phases depending on historical and political events, both at the national and international level. Following a period of guest-worker programmes (1963-1972) signed between the Maghreb and some European countries (France, Germany, Belgium and the Netherlands), the 1973 Oil Crisis and subsequent economic recession in Western Europe represent a turning point for Maghreb-European Migration, marking the end of the recruitment phase in Europe and the beginning of restrictive migration policies that continue to persist today. Notwithstanding these restrictive policies, two key events that characterised yet another phase of migration flows from the region to Europe were the first Gulf War of 1991 and the air and arms embargo imposed on Libya between 1992 and 2000. The flow of emigrants from North Africa has increased in the last 10 years, with continued labour force growth (2.8 percent a year for the region)[7] and high unemployment in the presence of limited labour demand playing their part as the main push factors.[8]

In general, poverty, unemployment and political instability in the region can be identified as the main causes of the decision to emigrate. Migration of unskilled and semi-skilled workers with rural origin has dominated the flow to Europe. However, skilled emigrants from North Africa have grown significantly over the past two decades. Information regarding the total number of expatriates, as well as the proportion of high-skilled provided by origin countries, do not always correspond to the statistics available in the receiving countries.[9] More recently, Docquier *et al.* (2009) have developed a dataset that highlights worldwide migrants' skill levels in the OECD.[10] Looking at the skilled migration rate of the Maghreb region in 2000, Morocco has almost 20 percent of its skilled workforce living abroad, Tunisia around 13 percent and Algeria almost 10 percent.[11] It is not clear if this

[6] Inflows of foreign population are derived from population registers or residence permit data. Illegal migration is not taken into account and therefore the information provided from the OECD International Migration Dataset gives us only a partial view.

[7] Includes Morocco, Tunisia, Libya, Algeria and Egypt.

[8] An updated dataset on immigrants in the OECD and non-OECD countries has been recently made publicly available in the OECD website (http://www.oecd.org/document/33/0,3746,en%202649%2037415%2046561249%201%201%201%203741%205,00.html).

[9] It may depend on the choice of different criteria of computation and it requires a consistent effort to harmonize data between sending and receiving countries

[10] The dataset is based on the aggregation of harmonized immigration data collected in OECD host countries for two periods, 1990 and 2000. Only individuals of age 25+ are considered as at that age education is assumed to be completed.

[11] The skilled migration rate is calculated as a proportion of the total educated labour force in the source country.

phenomenon reflects a change in migration selectivity or is simply the consequence of a general improvement in the level of education in origin countries. The World Bank (2010) highlights that the reasons behind the departure of educated individuals do not depend solely on wage differentials between Maghreb and Europe. Labour market conditions including unemployment, industry structure and a lack of career opportunities for the highly skilled are also considered to be important elements that affect the migration decision.

The migrant profiles from North Africa have also changed with respect to the gender composition. Before the 1980s, migrants were almost exclusively male and single. The scenario that appears today sees increasing labour market participation among migrant women. Initially, women migrated in the context of family reunification but they have gained an active role in the foreign labour market, which seems to be related to the improvement in education of women and the increase in demand in the domestic help sector in Europe (as cleaners and nannies). Just to give an example, between 30 and 50 percent of active Moroccan migrants in Europe are females – a 45 percent increase over the last two decades (The World Bank, 2005).

Finally, although for obvious reasons there are no official records on undocumented migration, the proportion of migrant workers crossing illegally into the EU has increased in the last two decades.[12] Illegal labour migrants are those individuals who do not fulfil the legal conditions of entry, stay and employment; they respond to an informal demand for labour.

North African population movements have generated a consistent flow of transfers to origin countries. The entire MENA region receives 10 percent of the world's remittances with North Africa accounting for a large proportion. Indeed, remittances in this region surpass other financial flows such as FDI. For example, remittances to Morocco accounted for 9 percent of the share of GDP in 2007. Remittances to Algeria and Tunisia constitute a much smaller share of GDP (2.1% and 1.7% in 2007) though such flows remain higher than both ODA and FDI.[13] More recently, remittance flows to the Maghreb have been affected by the global financial crisis – the World Bank (2010) reports that remittances may have declined by 10 percent between 2008 and 2009. Given that on a per capita basis, as well as a share of GDP, dependence on remittances in North Africa is greater than any other region in the world, and the impact of this decline may be significant. Nevertheless, remittance flows are forecast to increase again in the coming years.

[12] Thematic Session: Irregular Migration into and through Southern and Eastern Mediterranean Countries, available at: http//www.carim.org/index.php?areaid=15&contented=222.
[13] World Development Indicators (2009).

3. Data

The dataset used in this paper is extracted from the survey carried out by the MIREM project on return migrants to three countries in the Maghreb region, namely Algeria, Tunisia and Morocco.[14] The survey design and sampling methods followed a thorough inventory of the existing statistical and documentary data related to return migration in these countries. The distribution of sample responses across regions and by gender were verified and compared with the official census data to ensure the sample was representative.[15] Estimates on the number of return migrants in Algeria, Morocco and Tunisia, computed from census data, are available on the website of the MIREM project.[16]

Return migrants are defined as "*any person returning to his/her country of origin, in the course of the last ten years, having been an international migrant (whether short-term or long-term) in another country. Return may be permanent or temporary. It may be independently decided by the migrant or forced by unexpected circumstances*". Given the restricted geographical coverage of the survey and the focus on return migrants only, observed trends in the data may not be considered as evidence of wider national trends in the return migration cycle. Nonetheless, the data provide a unique opportunity to consider the microeconomic behaviour of return migrants across the Maghreb region.

The main objective of the MIREM project was to provide a better understanding of the challenges linked to return migration (as the reintegration path) and its impact on economic development. These outcomes were achieved by utilising questionnaire responses that identify migrant profiles at three different migratory stages: pre-migration conditions in the country of origin; migrant experiences in the country of immigration; and finally their conditions in the home country after return. Capturing such information enables the identification of those factors inherent in understanding the migration cycle. Importantly, it also enables us to distinguish between those migrants who chose to return home and those who were compelled or forced to return due to unexpected circumstances.

The MIREM survey is composed of 992 return migrants with approximately 330 individuals in each country interviewed between September 2006 and January 2007 using a common questionnaire (see Table 1).[17] Because of missing information for some of the relevant variables used in our analysis, our final sample consists of 845 observations. This

[14] The "Collective Action to Support the Reintegration of Return Migrants in their Country of Origin", MIREM project, was created in December 2005, with the financial support from the European Union and the European University Institute.
[15] http://rsc.eui.eu/RDP/research-projects/mirem/survey-on-return-migrants/methodology/
[16] http://rsc.eui.eu/RDP/research/analyses/statistics/
[17] See http://rsc.eui.eu/RDP/research-projects/mirem/survey-on-return-migrants/methodology

sample includes students, housewives and retirees since a small percentage of such respondents were observed to engage in remittance behaviour.[18] As discussed, the survey provides a rich source of information regarding migrant conditions prior to migration as well as various aspects of migrants' experiences (employment status, education and training received, legal or illegal status etc.) abroad and upon their return home. The survey also provides information regarding both the frequency and level of remittances.

Table 2 reveals that approximately 69 percent of all return migrants in the sample sent remittances regularly or at least "occasionally" (less than once a year) to their home country. The majority of remitters sent transfers monthly, though notable differences exist among the three countries: 31.4% and 26.1% respectively to Tunisia and Morocco compared to 4.3% in the case of Algeria. Algerian returnees report the highest percentage in the category of no-transfers (45.5%).

Table 3 shows the amount of remittances sent to the origin country by the migrant during the last year of their migration experience. The amount of remittances is in nominal terms and there is no control for inflation. However, the majority of migrants returned home after 2000. The earliest return was in 1996. Moreover, remittances are reported in euros and the euro has been quite stable with low inflation until recently.

Of those who remitted, around 67 percent reported transferring money to family members in the home country. Supporting the family for survival reasons is stated as the main purpose for sending remittances (87% of those who remitted). Financing children's education is also reported as being important.

The selected sample is predominantly male (88%) with a mean age of 26 years at the time of departure. Before migration, 26% were living in a rural location, 29% were married and 23% had children. Since family status is an important element in determining the remittance decision, we have constructed a variable to account for those who married at home and did not change status while abroad, as well as those who married in the destination country. The latter group constitute 32% of the sample. The survey asks explicitly whether the original migration decision was intended to be temporary or permanent. The intended form of migration is relevant for understanding remittance behaviour as temporary migrants are more likely to remit than those who migrate for long term. Approximately 27% of sample respondents stated that they intended to migrate on a permanent basis whilst 46% intended to

[18] While it is not clear how some individuals in the inactive category are able to remit, it is possible to make explain such behaviour. For instance, for retirees it is possible to argue that they were remitting from their retirement allowance or from non-wage income. For students and housewives, the source of their transfers may come income earned in a part-time job, perhaps in the informal sector. It is also possible that students remit from their scholarships.

return home. The remaining respondents did not know their intention at the time of migration. Economic reasons dominate the migration decision: More than half of the sample (67%) migrated to look for a better job or, more generally, to improve life conditions. Summary statistics are reported in Table 4.

Survey information regarding migrants' level of education is provided both before and during the migration experience. Most return-migrants were relatively well educated prior to migration with 38% having completed secondary school certificate and a further 26% having completed tertiary education. Approximately 15% of respondents reported having no qualification at the time of migration. Conversely, 24% obtained additional qualifications in the host country, thereby improving their level of education whilst abroad. To capture these dynamics, we construct a variable reporting the last level of education before return, taking into account the level of education before migration for those who did not study in the host country as well as the "new" qualification obtained for those who did. It is important to observe that the proportion of return migrants who studied abroad was higher for those who were relatively more educated prior to migration, i.e., those relatively better educated before migration were more likely to invest in education while abroad. We also found an inverse relationship between educational attainment and the duration of migration. On average, we observe a negative correlation between the level of education and the period of time spent abroad (see Figure 1).

A potential weakness of the MIREM survey is that it has no direct information regarding household income level or individuals' earnings, which, of course, would help us to understand better the remittances behaviour/motivation. To overcome this limitation, we consider an indirect measure to evaluate individuals' financial status. We use information in the survey questionnaire regarding their subjective financial situation in the country of origin, before migration. This is captured using three levels: good, satisfactory and bad.[19] Using this measure, approximately 61% of the sampled individuals declare themselves to be in at least 'satisfactory' financial situation before migration, suggesting that remittances may not be sent to provide for the basic consumption needs of the left-behind household members.

Furthermore, given that the MIREM survey has no direct information regarding migrant earnings, which is, of course, an essential condition of remitting, we use the migrant's labour force status and an indicator variable for whether the financial situation

[19] Another possibility would be to consider the type and number of goods they owned before migration. We decided to exclude this possibility firstly because we have only very general information on the types of goods and secondly because it is not clear if these goods belong to the migrant or to the household as a whole. It is also possible that young migrants declare not to have any goods even if they come from wealthy families.

abroad has improved or not.[20] One of the main contributions of the MIREM database is that it provides information on the labour force status of migrants at various points of the migration cycle. In our analysis of remittance behaviour, we focus solely on the last activity in the host country. This is primarily because the question capturing the decision to remit refers to the last period of the migration experience and we do not have any information on the exact time migrants start to remit. We assume that the remittance behaviour before returning home is partially determined by the most recent activity in the host country

The survey groups labour market activities into 12 professional categories. We aggregate across these groups and reclassify migrants into one of four labour market states: inactive, unemployed, wage earners and self-employed. The distribution of these labour market states is reported in Figures 2 and 3. The wage earner category includes individuals with indefinite contracts, fixed term contracts, part-time and seasonal workers; and represents 64.7 percent of the selected sample. The self-employed account for 16.6 percent of the sample and includes business owners employing at least one person, legal or illegal independent workers, and those individuals who report themselves as family workers.[21] The inactive and unemployed account for 18.7 percent of the sample.[22]

Some of the returnees (18%) in the sample report migrating more than once, either to the same or a different host country. Accordingly, we classify these respondents as circular migrants. France is the primary destination country for the migrants in our sample, perhaps reflecting past colonization and/or the influence of French institutions and governance following independence. Italy is the second largest destination, most probably because of geographic proximity. We aggregate the destination countries into 6 groups: France; Italy; other South EU; other EU; MENA region; rest of the World. Ideally, we would control for unobservable characteristics of the destination countries by introducing a dummy for each country. However, this is not possible because we have a small sample for each of the 36 different destination countries (just 1 or 2 observations in some cases).

Overall, 14% of our sample entered their destination country illegally with Moroccans leading the group (31%) followed by Tunisians (10%) and Algerians (4%). The legal/illegal status is constructed from a specific question relating to the conditions under which the migrant entered the host country. Illegal status is defined as entering without legal

[20] The financial situation did not improve for only 17% of the sample.
[21] It may argue that family workers should be considered in the wage earner category. Based on the special link that characterises relationships in a family we conclude that the interest of the worker coincides with of the family, therefore the decision to include them in the self-employed category.
[22] The unemployed are part of the workforce and therefore need to be separated from the inactive category composed of students, housewives and retired.

documentation, using false document or violating the terms of visa entry (e.g., working on a tourist visa or overstaying).

Most of the migrants, during their time abroad, declared to be regularly in touch with their family members at home through telephone, letters and e-mails, and for 57% of them family had been the main source of information in the returning process. Furthermore, a significant proportion (31.7%) of return migrants has invested in at least one project upon return. This suggests that migration could be interpreted as a strategy to alleviate credit market imperfections and invest in a project on return using past remittance transfers and possibly savings accumulated abroad (see Mesnard, 2004; Piracha and Vadean, 2010).[23] We hypothesize that there is a positive link between the amounts of remittances sent home and the investment decision upon return. Overall, 32% of return migrants invested in a project in the country of origin. The descriptive statistics by country of origin show that those who invest more upon return are migrants from Tunisia (42%) while those from Algeria invest much less (17%), which indicates investment from remittances combine with the local investment environment. Finally, individuals evaluate positively the experience abroad: 79.5% of the interviewees claimed to have taken advantage from the experience overseas and 38% of the return migrants think to repeat the migration experience.

4. Analytical and empirical framework

The analysis of remittance behaviour needs to be collocated within the utility maximization framework (Bettin *et al.* 2012):

$$\begin{aligned} &\max U_i = (c_i, r_i) \\ &s.t. y = c_i + r_i + \tau \cdot I(r_i > 0) \end{aligned} \tag{1}$$

where U_i is the utility function, c_i, r_i and y_i are, respectively, the migrant's consumption, remittances and income while τ is the fixed cost of sending remittances and *I(.)* is the indicator function.

It is possible to assume that for each migrant the marginal utility of consumption is strictly positive $U_i^c > 0$, while the marginal utility with respect to remittances is $U_i^r \geq 0$ indicating that for some individuals the optimal amount of remittances might be zero. In fact, if $\tau > 0$, by continuity we have that $\lim_{r_i \to 0} U(c_i, r_i) < U(c_i, 0)$; i.e., it means that when sending

[23] We unfortunately do not have information on retained savings brought back home by the return migrants. The remittance data in MIREM may or may not include it.

money home is costly, there is a minimum amount of remittances $\underline{r}$ under which the additional utility that the migrant derives from remitting is lower than the utility of not remitting.

Zero remittances can occur because (i) migrant's income is too low and/or transfer costs are too high therefore, the value of r solving the maximization program (1) is $r_i^* < \underline{r}$; (ii) the migrant does not attach any utility to remittances ($U_i^r = 0$). Given that $\underline{r}$ is probably partially individual-specific, it is quite challenging to quantify it exactly. Moreover, transfer costs depend on the remittance destination and it is very difficult to take non-monetary costs into account. However, as discussed by Bettin *et al.* 2012, it is reasonable to assume that $\underline{r}$ and τ are of the same order and magnitude.

In modelling the determinants of the migrants' transfers, it is important to consider the nature of the dependent variable. If the decision to remit and the amount remitted are governed by the same mechanism and zero remittances are only caused by a budget constraint then the appropriate approach is to consider censored regression models such as Tobit.[24] This model postulates a latent remittance outcome for nonparticipants (i.e. those who do not remit) whereby the associated log-likelihood function consists of two parts: one that corresponds to the classical regression for the uncensored observations, and another that corresponds to the relevant probabilities that an observation is censored.

In the current context, the above approach has two main drawbacks. First, the model is only applicable where zero values are due to non-observability, that is, the data capture true censoring. This may not be the case since observed zeroes could represent the decisions of individuals not to remit. Second, the model is restrictive in that it assumes the same mechanism underlies both the intensive and extensive margins. However, it is highly likely that the decision to remit may depend on factors other than those that determine the level of remittances. Accordingly, an alternative framework allows to separate the decision to remit from the amount of remittances. If we then assume that migrants who gain utility from remittances always remit, then zero remittances only occur if migrants do not attach any utility to remittances. The Heckman selection model, based on the idea that migrants who choose to remit are a self-selected group and therefore estimations of the level of remittances need to be corrected for the selection bias they contain, would be the appropriate approach.

[24] The Tobit model cannot be implemented in our specific case because the amount of remittances is not observed in a continuous form. We use the interval regression approach and we show the results in the appendix in Table A1. An alternative estimation strategy is to use an ordered probit where the first ordinal outcome is $r_i=0$ if $r_i^* \leq 0$.

However, if we assume that the observed zeroes can be generated from two different processes: behavioural zeroes (non-participation) and random zeroes (participation but no remittances), the approach to follow is the double hurdle model or simple two-part model. It permits different mechanisms to generate the alternative and can be expressed as:

Remittance decision: $$d_i^* = z_i'\beta_1 + \varepsilon_i \text{ with } d_i = \begin{cases} 0 & if\ d_i^* \le 0 \\ 1 & if\ d_i^* > 0 \end{cases} \quad (2)$$

Remittance level: $$\left(r_i \mid d_i^* > 0\right) = x_i'\beta_2 + v_i \quad (3)$$

Equation (3) represents the remittance decision of return migrants. The variable d_i^* is a latent variable that determines the discrete outcome d_i, the decision to remit. The discrete outcome is observed with $d_i = 1$ if $d_i^* > 0$ and $d_i = 0$ if $d_i^* \le 0$. The z_i' is a vector of non-stochastic regressors and β_1 is a vector of unknown parameters. Assuming the errors, ε_i, are standard normal, consistent estimates of β_1 can be obtained using maximum likelihood estimation (MLE).

Equation (3) represents the remittance level r_i conditional on the decision to remit, where r_i is a continuous non-negative random variable bounded at zero. Again, x_i' is a vector of regressors that may include those contained in z_i' or additional ones. The errors v_i are again considered to be independent normal.[25]

Remittances in the MIREM data are reported as interval data ranging from less than €200 to more than €1000. Interval data presents a problem when utilised as a dependent variable. Assigning the midpoint to observations in any given group is one possible method to deal with this type of data (Bettin *et al.*, 2012). However, taking midpoints of the intervals introduce measurement error bias and allocating values to open-ended groups is an *ad hoc* procedure that is known not to produce consistent parameter estimates.[26] Accordingly, we adopt an alternative strategy and utilise the approach of Stewart (1983), which recognises that

[25] The two step selection model, or simply Heckman model, assumes dependence between the two error terms (ε_i, v_i). The correction of any bias that might be present due to selectivity issues sees the introduction of a second latent variable (instrumental variable) in the first step equation from which is calculated the Mills ratio: $\phi(\beta_1 z_i)/\Phi(\beta_1 z_i)$. This ratio is used as an additional regressor in the second step equation to correct for selectivity.

[26] The analysis would not reflect the uncertain nature of the exact value within each interval nor would it deal adequately with the left and right censoring issues in the tails.

the upper and lower bounds of observed intervals provide important information for the consistent estimation of an econometric model.

We assume that the errors, v_i, in Equation 3, are independently identically normally distributed random variables with zero mean and variance σ^2. This yields the distribution of the unobserved dependent variable as:

$$r_i \sim N(x_i\beta_2, \sigma^2) \tag{4}$$

The dependent variable is observed to fall into a certain range on the real line. Let R_{k-1} and R_k be the lower and upper boundaries of the k^{th} range

$$R_{k-1} < r_i \leq R_k \tag{5}$$

In our data, the lower bound of remittances is closed at zero and the upper one is open ended. In logarithmic form both extreme ranges are open ended such that $R_0 = -\infty$ and $R_k = +\infty$, where k is the number of groups. The log likelihood of this model is thus:

$$\log L = \sum_{k=1}^{K}\sum_{i\in k}\log\left\{\Phi\left[\frac{\left(R_k - X_i'\beta_2\right)}{\sigma}\right] - \Phi\left[\frac{R_{k-1} - X_i'\beta_2}{\sigma}\right]\right\} = \sum_i \log\{\Phi_k - \Phi_{k-1}\} \tag{6}$$

where $\Phi(\ )$ is the cumulative distribution of the standard normal. Consistent estimates of β_2 and σ are obtained by Maximum Likelihood Estimation (MLE). The sign of the regression parameters β_2 can be interpreted as determining whether or not the level of remittances increases with the regressor.

5. Results

The advantage of the two-part model is that it allows the determinants of the probability and the level of remittances to be investigated separately under the assumption that these two decisions are generated by different probability mechanisms. We have found that the amount remitted is affected by variables that do not impact the probability to remit. We would not be able to arrive at the same conclusion if we assumed a joint mechanism as in the case of the Tobit model or related models discussed earlier. In the discussion that follows

we explain results from the two-part model; the results for Heckman model are presented in Table A2 in the Appendix but not discussed here.[27]

5.1 The decision to remit and the amount remitted

The results of the two-part model are reported in Table 5. Columns (1) and (2) report, respectively, the marginal effects of a simple probit model on the decision to remit and the results for the interval regression on the determinants of the amount transferred conditional on the decision to remit. The results reveal that gender has no impact on the decision to remit but female migrants transfer significantly less than their male counterparts. The finding that women remit less than men is widely observed in studies on remittances. This may reflect gender disparities in the labour market relating to both opportunities and earnings , but may also indicate a strong patriarchal nature of society in many developing countries. Although we control for gender in our empirical strategy, we are not able to control for the relationship of the migrant with the head of the household at the time of migration. This additional information might provide further insight into the remittance behaviour of returning migrants.. Unfortunately, the survey does not provide such information.

We find clear origin country effects with migrants from Morocco and Tunisia being 19% more likely to remit than those from Algeria. A similar finding is reported by Miotti *et al.* (2010) who investigate the remittance behaviour in the Southern Mediterranean countries from the perspective of a receiving country, France. This may suggest that, independently

[27] Note that the two-part model attains its flexibility by assuming that the two parts – the decision to remit and the amount remitted – are independent. If we permit the possibility of dependence between the disturbance terms then a Heckman Sample Selection Model may be more appropriate. However, such models involve important identification issues. In particular, in order to identify the participation decision from the level decision it is necessary that we can identify an exogenous variable(s) which affects the decision of whether or not to remit but does not affect the decision of how much to remit. The availability of valid exogenous variables permits the hypothesis of independence of the disturbances in Equations (2) and (3) to be tested directly and corrects for any selection bias arising from correlation between the two disturbances. We identify the exogenous variables in frequency of contact with the household members while abroad and form of migration. In fact, the relation with the home country, through phone, letters and/or visits strengths the attachment to the home country and keeps migrants involved in the life of those left behind. Bettin *et al.* (2012) use distance between home and host country as a proxy for migrant relation with the home country: being more far away increases the cost of visiting and spending some time at home (circular migration) as well as reducing the frequency of contacts due also to different time zones. The MIREM dataset allows us to use direct measures of migrant's relation with the home country. Intuitively, the probability of sending remittances decreases as the contacts and visits to the home country decrease while the amount of remittances is likely to be influenced by factors related to individual and household characteristics, labour supply and consumption. We utilise our exogenous variables as exclusion restrictions to test formally between the two-part and Heckman alternatives. Table A2 shows no evidence of selectivity bias: the Mills ratio calculated from the first step equation is insignificant in the second step equation. Moreover, the two exclusion restrictions, frequency of contact with the household members while abroad and form of migration, were added as covariates in equation (3) and as expected they appear to be insignificant in explaining the amount of remittances sent to the home country. We conclude the two-part model to be the appropriate empirical framework to study remittance behaviour using the MIREM data. For conciseness, the results presented in Table A2 are excluded from the discussion in this section.

from the host country, there are some factors related to the home country that make Algerians behave differently from those from the other two countries.[28] Moreover, those coming from a rural area are more likely to remit.

Although we do not have any information on the income and earnings levels of our migrants before and during migration, we do consider subjective personal evaluations regarding the financial situation before and during migration.[29] We find a negative impact on both the probability and level of remittances where migrants report non-improvement to their financial situation in the host country. Illegal status has no effect on the probability to remit but has a strong positive effect on the level of remittances. Illegal migrants remit as a form of insurance against the uncertainty attached to their legal status (see Piracha and Zhu, 2012). Under uncertain migration conditions individuals remit a greater fraction of their earnings. The insurance hypothesis is strongly supported by our findings: illegal migrants remit 68 percentage points more than those who enter the host country under legal conditions. Notably, time spent abroad has a very small, albeit non-linear, effect on the probability to remit.

Surprisingly, the intended form of migration (temporary vs. permanent) has no effect on remittance behaviour. This could reflect the uncertainly at the time of migration decision or alternatively intentions might change while in the host country. By contrast, reasons for migration do impact strongly on remittance behaviour, particulary the probability to remit. Those who migrate for work (better employment/ better salary/better work conditions) or to improve life conditions have a higher probability of remitting.

Family ties are considered to play a positive and significant role in explaining the decision to remit (Bettin *et al.*, 2012). In line with this argument, we find that keeping links through letters, e-mails and phone calls with the family members left behind impacts positively on the probability to remit. Strong relations with the home country are also kept by circular migrants; the probability of remittances increases with the number of exits (migrants who move frequently between origin and host countries).

Educational attainment and type of occupation in the host country affect only the probability of remittances. The probability of remitting decreases with the educational attainment of the migrants. The argument generally put forward for this result is that skilled migrants tend to stay in the host country relatively longer-term and have a high probability of

[28] For example, Algeria is wealthier than Morocco and Tunisia and this may lead to a less incentive to remit.
[29] The use of subjective variables may lead to some criticisms but, as Miotti *et al.* (2010) argue, individuals should be in a better position to evaluate their financial situation. The migrant's perception of the income level before departure can help understand their remittance behaviour.

settling in the host country with their family (see Faini, 2006). Since our analysis is based on return migrants only, a better explanation for this observed negative effect of education on the decision to remit might be that better educated migrants may enjoy more favourable conditions in the home country, thus reducing the need for remittances. The better educated may also be affected less by social pressure to remit (Dustmann and Mestres, 2010). Interestingly, we do not find any impact for the duration of migration on the probability to remit. A possible explanation may be that the effects of duration are mitigated by the temporary aspect of return migration.

Looking at the effect of migrants' labour force status on the probability to remit, we find that wage earners and the self-employed are more likely to remit than individuals who are not in the labour force (students, housewives and retired). Although we do not observe migrants earnings or incomes, we may suppose that migrants with higher earnings are likely to remit more. It is also reasonable to consider the self-employed and wage earners to have higher incomes than inactive or unemployed migrants who may draw from past accumulated savings or some form of part-time earnings. Our finding is in line with Mahuteau *et al.* (2010) who find that being self-employed or a wage earner positively affects the probability of remitting.

Finally, because of lack of information on the earnings in the host country, we use the migrant perception of his financial situation abroad. Not surprisingly, our results show that for those who did not experience any change in their financial situation after moving abroad remitted a lower amount than the ones who reported better financial circumstances.

5.2 Remittance behaviour by type of return

The type of return (decided or compelled) is considered important in understanding and identifying the patterns of reintegration in the origin country (Cassarino, 2008). [30] In our selected sample, 644 migrants report that they decided/chose to return home while the remaining 201 were compelled to do so. The compelled returnees include a heterogeneous group of individuals who, for different circumstances, were forced to interrupt their migration experience. The majority of them returned home because they were expelled or their visa in the host country expired (about 45 per cent). Some other needed to leave the host country

[30] "Decided or chosen return refers to a migrant who decides on his own initiative to go back to the country of origin, without any form of pressure or coercion whatsoever. Decided return is based on the free will of the migrant to return" (Cassarino, 2008). Compelled or forced return, however, refers to a condition when a migrant returns to his country of origin "as a result of unfavourable circumstances and factors which abruptly interrupt the migration cycle" (Cassarino, 2008). In particular, forced return is the result of restrictive and selective immigration policies in the destination country

because of fiscal/administrative problems (14 per cent). Serious health problems and loss of job are among other circumstances which forced the migrant to return home. Instead, retirement, homesickness and creation of a project are the main reasons to return home for the decided returnees. Family reasons are causes of return for both groups.

In order to further explore the profile of the two types of returnees, Table 6 reports descriptive statistics by type of return alongside a z-test to investigate whether differences exist between them. The reported p-values indicate that the null hypothesis of equal means between decided versus compelled returnees is rejected for certain characteristics that help explain the remittance behaviour. In particular, differences exist in terms of return age, level of education, duration of the migration experience as well as the occupational status between the two groups of return migrants. For example, on average the age of return (32 years) of the compelled returnees is less than the ones who decided to return (44 years) as well as the average duration of the migration experience (8.4 years for the compelled returnees vs. 18 years for those who decided to return). Moreover, those who decided to return had chosen France as the preferred destination while Italy and 'Other south EU' country seem to have been preferred by those who were compelled to return. Finally, we investigate if these differences are relevant in the case of remittance behaviour, and perform a Wald test to identify whether the coefficients estimated for those who decide to return are equal to the coefficients estimated for those who were compelled to return. The test does not reject the null hypothesis of equality across the two groups.

Neverthess we consider it informative to present participation and level of remittances by type of return (see Table 7). Marital status, independently of the timing of marriage – before or during the migration experience –positively affects the amount remitted by the compelled returnees. However, for those who decided to return, marital status has no impact on remittances though the presence of children in the household before migration affects positively the probability to remit. This could possibly be due to the fact that the compelled sample is younger, and therefore have a lower probability of having children, or it could simply reflect a lack of statistical power due to the small sample of compelled returnees.

Given that forced returnees have a higher probability to be illegal migrants, we expect a stronger impact of illegal entry in the host country on remittances behaviour when the return is compelled. Illegal entry is found to be positive for both types of returnees while the effect on the probability to remit is significant only for the decided returnees. One explanation maybe that those who decided to return home were more aware of the risk of their illegal status resulting in positive effects on the intensive and extensive margins of

remittances. By contrast illegal status has no impact for compelled returnees who had initially planned to remain in the host country for longer. Interestingly, the intended form of migration is an important determinant of the probability of sending remittances when the analysis is conducted by type of return. On the one hand, the initial intention of moving permanently affects negatively the probability of remitting for the decided returnees: their plan of settlement in the host country discourages remittances. On the other hand, the opposite effect is found in the case of compelled returnees. It is possible to think that those planning to settle in the host country permanently might have been aware of the difficulties of realizing their expectation (for example, because they were illegal migrants) and therefore identified remittances as their "insurance" in case of failure of their initial plan.

Finally, the reasons for migration, level of education and labour force status affect the probability of remitting only in the case of decided returnees. Absence of statistical significance of these effects for the compelled retrurnees maybe explained by the illegal status which characterizes the majority of them.

6. Conclusion

The aim of this paper is to highlight the determinants of remittances by migrants from the Maghreb region, namely Algeria, Morocco and Tunisia. The data used in our analysis is drawn from the MIREM project, which captures different migratory stages, i.e., pre-migration conditions in the country of origin; migrant experiences in the host country; and their circumstances in the home country after return.

A key feature of our data is that it provides information on those who decided to return to their country of origin as well as those who were compelled by circumstances (perhaps for being illegal). To our knowledge, this is the first paper that analyses the remittance behaviour by type of return, albeit with some limitation (e.g. there is insufficient information to identify selection into either of these categories).

We utilise a two-part model to explore the intensive and extensive margins of the decision to remit. We identify the intended form of migration, i.e., temporary or permanent, and also distinguish between migrants who chose to return home and those who were compelled or forced to return. We find no effect in relation to the intended form of migration on either the probability or level of remittances for the pooled sample. However, when we split the sample between decided and compelled returnees, we identify opposite and statistically significant effects between each group. A negative effect on the probability of remitting is found for those who intended to migrate permanently but who decided to return

of their own volition. By contrast, those who intended to migrate permanently but were compelled to return have a higher probability of remitting. No effect is found regarding the level of remittances in either instance.

Lack of relevant information in the data did not allow us to properly explore the distinction between the remittance behaviour of decided and compelled returnees. We consider this distintion an important avenue for future research that could provide new insights into how people make their remittance choices while abroad. Varying degrees of willingness to return, as well as the capacity to mobilize resources to the origin countries, are key elements in understanding the potential contribution of return migrants to the economic development of sending countries. For those who choose to return to their country of origin, the migration experience may represent a calculated strategy defined by the migrants and their families (e.g., overcoming credit constraints). Under this assumption, return is part of the migration cycle and occurs after the migrants have achieved their objectives in terms of acquiring human and financial capital (remittances and/or savings) in the destination country. In this context, remittances may reflect a willingness to invest in capital projects and related activities upon return.

The story is different in the case of compelled returnees. Given that those who are compelled to return are more frequently illegal migrants, the remittances sent may reflect an insurance meahnasim that mitigates failure of the migration experience. Alternatively, it could be driven by altruism towards family members. Richer data would allow further investigation of remittance motives of this group of migrants.

The illegal status is an important determinant of the remittance behaviour for the two types of returnees. It is plausible to assume that illegal migrants do not use formal channels to send transfers, such as banks or credit unions, but rely on informal channels which make remittances more difficult to be tracked. Identifying the channels by which remittances flow could lead to better understanding of net income transfers and facilitate stronger cooperation between origin and destination countries in terms of migration management.

Of course, the ability of returnees to invest in the home country and contribute to its development depends also on the conditions of return. This highlights the importance of programmes to support the reintegration process of return migrants in the home country not only through simplified administrative procedures but also through programmes and facilities in the business sector that help overcome lack of information as well as constraints on entrepreneurship opportunities. Even if the proportion of migrants that return home is quite small, evidence shows that return migrants are more likely to be engaged in entrepreneurial

activities than those who didn't migrate and therefore their contribution towards promoting development can be quite pronounced (Demurger and Xu, 2011; Piracha and Vadean, 2010).

Finally, remittances are not solely a monetary phenomenon but could also entail social, political and cultural elements. These include ideas, values, practices and codes of behaviour which have a long-lasting effect both sending and destination countries. The importance of the destination country is crucial as it determines the content of social remittances: models of lifestyle, wealth, human capital investments etc. Given that France and Italy are the main destination countries of migrants from the Maghreb region, it is expected that host countries' cultural traits are transmitted to the origin countries. It is difficult to quantify these forms of transfer (see Anghel et al 2016 for a review of the literature) but it is not in doubt that social remittances link society of origin and destination countries, and that the intensity of this link could be stronger in the case of migrants who return and share their experiences.

References

Agarwal, R., Horowitz A. W. (2002). Are International Remittances Altruism or Insurance? Evidence from Guyana Using Multiple-Migrant Households. *World Development* 30 (11), 2033-2044.

Amuedo-Dorantes, C., Pozo S. (2006). Remittances as Insurances: Evidence from Mexican Immigrants. *Journal of Population Economics* 19, 227-254.

Anghel, R. G., Piracha, M., Randazzo, T. (2015). Migrant's Remittances: Channeling Globalization in L.S. Talani and S. McMahon (Eds.), Handbook of International Political Economy of Migration, Edward Elgar Publishing, 2015.

Baldwin-Edwards, M. (2006). Between a Rock and a Hard Place: North Africa as a Region of Emigration, Immigration and Transit Migration. *Review of African Political Economy* 108, 311-324.

Bettin, C., Lucchetti R., Zazzaro, A. (2012). Endogeneity and sample selection in a model for remittances. *Journal of Development Economics* 99, 370-384.

Bollard, A., McKenzie, D., Morten, M., Rapoport, H. (2011). Remittances and the Brian Drain Revisited: The Microdata Show that More Educated Migrants Remit More. *Word Bank Economic Review* 25(1), 132-156.

Brown, R. (1997). Estimating Remittances Functions for Pacific Island Migrants. *World Development* 25(4), 613-626.

Brown, R., Poirine, B. (2005). A Model of Migrants' Remittances with Human Capital Investment and Intrafamilial Transfers. *International Migration Review* 39 (2),407-438.

Cameron, A. C., Trivedi, P. K. (2005). Microeconometrics. Methods and Applications. Cambridge: Cambridge University Press.

Cameron, A. C., Trivedi, P. K. (2010). Microeconometrics Using Stata. Revised Edition. Stata Press.

Cassarino, J-P. (2008). Return Migrants to the Maghreb: Reintegration and Development Challenges. MIREM Global Report, Robert Schuman Centre for Advanced Studies (RSCAS), European University Institute, Italy.

Clark, K., Drinkwater, S. (2007). An Investigation of Household Remittance Behaviour: Evidence from the United Kingdom. *The Manchester School* 75 (6), 717-741.

Cox, D., Jimenez, E. (1992). Social Security and Private Transfers in Developing Countries: The Case of Peru. *The World Bank Economic Review* 6 (1), 155-169.

De Haas, H. (2007). North African Migration Systems: Evolution, Transformations and Development Linkages. International Migration Institute, University of Oxford, Oxford.

de la Brière, B., Sadoulet, E., de Janvry, A., Lambert, S. (2002). The Role of Destination, Gender, and Household Composition in Explaining Remittances: An Analysis for the Dominican Sierra. *Journal of Development Economics* 68, 309-328.

Demurger, S., Xu, H. (2011). Return Migrants: The Rise of New Entrepreneurs in Rural China. World Development 39 (10), 351-372.

Di Bartolomeo, A., Thibaut, J., Perrin, D. (2010). Migration Profile: Algeria. CARIM – Robert Schuman Centre for Advanced Studies, December.

Di Bartolomeo, A., Fakhourly, T., Perrin, D. (2009). Migration Profile: Morocco. CARIM – Robert Schuman Centre for Advanced Studies, November.

Di Bartolomeo, A., Fakhourly, T., Perrin, D. (2010). Migration Profile: Tunisia. CARIM – Robert Schuman Centre for Advanced Studies, June.

Docquier, F., Lindsay Lowell, B., Marfouk, A. (2009). A Gendered Assessment of the Brain drain. *Population and Development Review* 35(2), 297-321.

Dustmann, C., Metres J. (2010). Remittances and Temporary Migration. *Journal of Development Economics* 92, 62-70.

El-Sayed Hassan, K. (2009). Levels and Trends of International Migration in North Africa. Working paper at http://iussp2009.princeton.edu/papers/90625.

Faini, R. (2007). Remittances and the Brain Drain: Do More Skilled Migrants Remit More? *The World Bank Economic Review* 21 (2), 177-191.

Funkhouser, E. (1995). Remittances from International Migration: A Comparison of El Salvador and Nicaragua. *The Review of Economics and Statistics* 77 (1), 137-146.

Glytsos, N. (1988). Remittances in Temporary Migration: A theoretical model and Its Testing with the Greek-German Experience. *Weltwirtschaftliches Archiv* 124 (3), 524-549.

Glytsos, N. (1997). Remitting Behaviour of Temporary and Permanent Migrants: The case of Greeks in Germany and Australia. *Labour* 11 (3) 409-435.

Gubert, F., Nordman C. (2008). Return Migration and Small Enterprise Development in the Maghreb. Background Paper, The World Bank, February.

Gubert, F., Nordman C. (2008). Who Benefits More from Migration? An Empirical Analysis Using Data on return Migrants in the Maghreb. Background Paper, The World Bank, March.

Hoddinott, J. (1994). A Model of Migration and Remittances Applied to Western Kenya. *Oxford Economic Papers* 46 (3), 459-476.

Lu, M. (1999). Do People Move When They Say They Will? Inconsistencies in Individual Migration Behaviour. *Population and Environment* 20 (5), 467-488.

Lucas, R., Stark O. (1985). Motivation to Remit: Evidence from Botswana. *The Journal of political Economy* 93 (5), 901-918.

Mahuteau S., Piracha M., Tani, M. (2010). Selection Policy and Immigrants' Remittance Behaviour. IZA *Discussion paper* No. 4874, Bonn: Institute for Study of Labour

Markova E., Reilly B. (2007). Bulgarian Migrant Remittances and Legal status: Some Micro-Level Evidence from Madrid. *South-Eastern Europe Journal of Economics* 1, 55-69.

Mesnard, A. (2004). Temporary migration and capital market imperfection. *Oxford Economic Papers* 56, 242-262.

Miotti, L., Mouhoud El M., Oudinet, J. (2010). Migrations and Determinants of Remittances to Southern Mediterranean Countries: When History Matters! *Second International Conference on Migration and Development*, World Bank, Washington DC.

Niimi, Y., Ozden, C., Schiff, M. (2008). Remittances and the Brain Drain: Skilled Migrants Do Remit Less. IZA *Discussion paper* No. 3393, Bonn: Institute for Study of Labour.

Piracha, M., Vadean, F. (2010). Return Migration and Occupational Choice: Evidence from Albania. *World Development* 38 (8), 1141-1155.

Piracha, M., Zhu,Y. (2012). Precautionary Savings by Natives and Immigrants in Germany. *Applied Economics* 44(21), 2767-2776.

Poirine, B. (1997). A Theory of Remittances as an Implicit Family Loan Arrangement. *World Development* 25 (4), 589-611.

Rapoport, H., Docquier, F. (2006). The Economics of Migrants' Remittances. In: Kolm, S.-C., Mercier Ythier, J. (Eds.), *Handbook of the Economics of Giving, Altruism and Reciprocity, North Holland*, 1135-1198 (Ch. 17)

Rodriguez, E. (1996). International Migrants' Remittances in the Philippines. *Canadian Journal of Economics* 29 (2), S427-432.

Stewart, M. (1983). On Least Squares Estimation when the Dependent Variable is Grouped. *Review of Economics Studies* L, 737-753.

The World Bank (2005). Global Economic Prospects 2006: Economic Implications of Remittances and Migration. Washington, D.C.: International Bank for Reconstruction and Development/ The World Bank.

The World Bank (2010). Labour Migration from North Africa. Development Impact, Challenges and Policy Options. Volume 1: Main Report, Washington, D.C.: International Bank for Reconstruction and Development/ The World Bank.

Van Dalen, H. P., Groeneworld, G., Fokkema, T. (2005). Remittances and their Effect on Emigration Intentions in Egypt, Morocco and Turkey. *Popular Studies* 59 (3), 375-392.

Figure 1 – Period abroad by origin country and last level of education

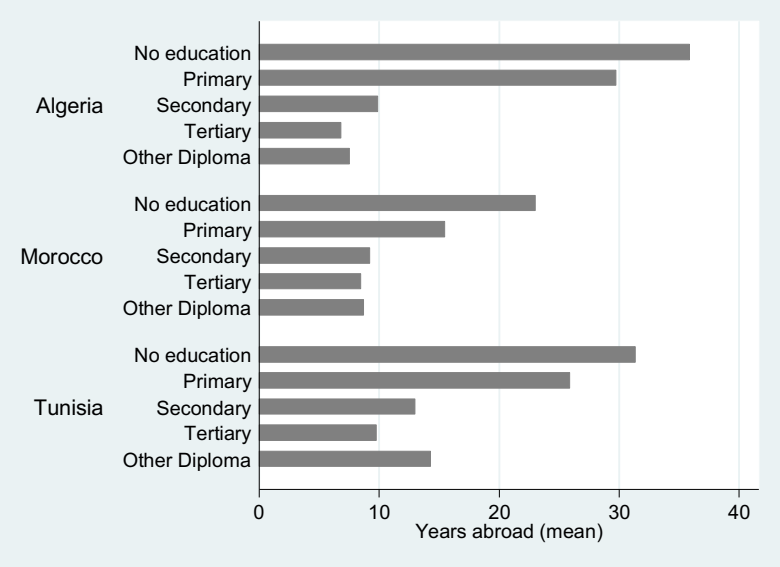

Figure 2. Composition of the labour force status

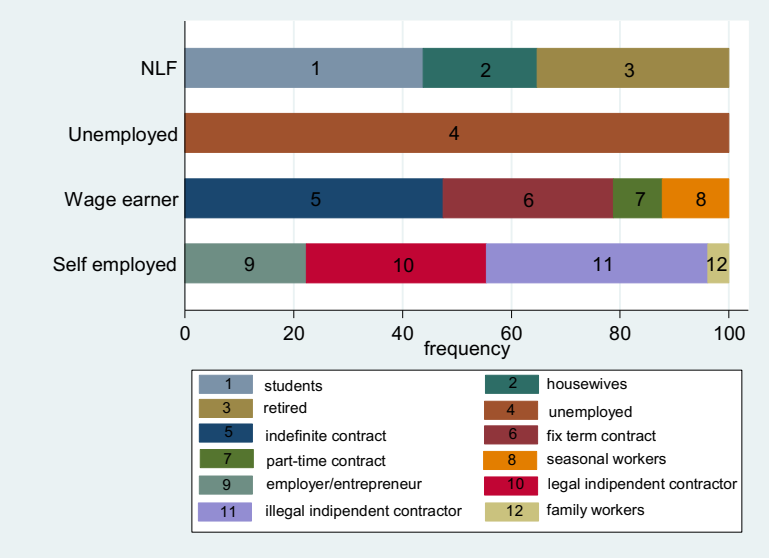

Figure 3. Last activity in the host country by origin country

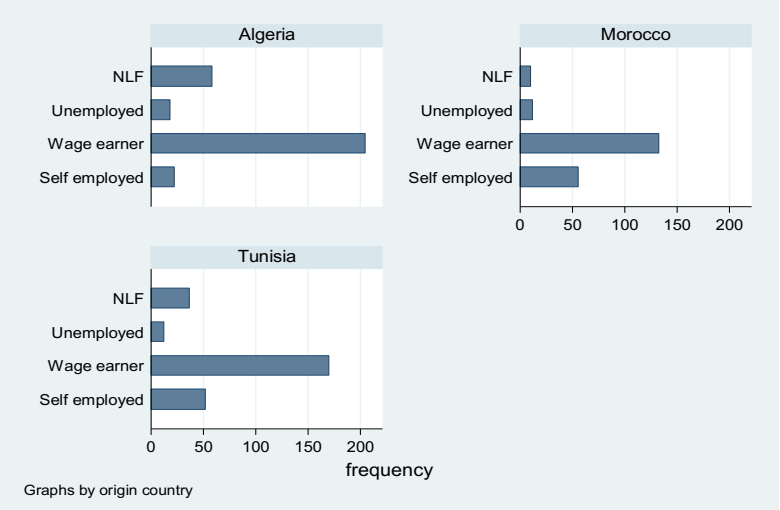

Table 1. Geographical stratification

Algeria			Morocco			Tunisia		
Wilayas	n	%	*Regions*	n	%	*Governorates*	n	%
Algiers	104	31,3	Tadla-Azilal	111	33,6	Tunis	122	37
Setif	82	24,7	Casablanca	99	30	Ariana	40	12,1
Bejaia	75	22,6	Chaouia-Ourdigha	57	17,3	Sfax	40	12,1
Tlemcen	71	21,4	Rabat-Salè-Zemmour-Zaër	50	15,2	Sousse	40	12,1
						Nabeul	28	8,5
			Other regions	13	3,9	Medenine	25	7,6
						Mahdia	20	6,1
						La Manouba	15	4,5
Total	**332**	**100**		**330**	**100**		**330**	**100**

*Source:*MIREM

Table 2. Remittance frequency

	Algeria		Morocco		Tunisia		All	
Frequency of sending remittances	n	%	n	%	n	%	n	%
Every month	13	4,29	55	26,07	85	31,37	153	19,49
Every three months	34	11,22	37	17,54	56	20,66	127	16,18
Every six months	37	12,21	13	6,16	6	2,21	56	7,13
Every year	49	16,17	23	11	5	1,85	77	9,81
Occasionally	38	10,56	37	17,54	59	21,77	128	16,31
Never	138	45,54	46	21,8	60	22,14	244	31,08
Total	**303**	**38,6**	**211**	**26,88**	**271**	**34,52**	**785**	**100**

Table 3. Remittance amount per year

Country	sending nothing		Less than €200		€200 - €500		€501-€1000		More than €1000	
	n	%	n	%	n	%	n	%	n	%
Algeria	138	45,54	23	7,59	43	14,19	35	11,55	64	21,12
Morocco	46	21,8	28	13,27	46	21,8	38	18,01	53	25,12
Tunisia	60	22,14	33	12,18	73	26,94	35	12,92	70	25,83
All	**244**	**31,08**	**84**	**10,71**	**162**	**20,64**	**108**	**13,76**	**187**	**23,82**

Table 4. Descriptive statistics

	Algeria	Morocco	Tunisia	ALL
Female	1.129	1.097	1.114	1.115
	(0.335)	(0.297)	(0.319)	(0.319)
Married before migration*	0.332	0.215	0.301	0.289
	(0.472)	(0.412)	(0.460)	(0.453)
Married while abroad	0.276	0.308	0.384	0.322
	(0.448)	(0.463)	(0.487)	(0.467)
HH size before migration	7.107	6.911	6.138	6.721
	(3.261)	(3.006)	(2.874)	(3.088)
Having children before migration	0.276	0.186	0.228	0.234
	(0.448)	(0.390)	(0.421)	(0.424)
HH size abroad	3.003	3.781	3.547	3.407
	(1.972)	(2.692)	(2.039)	(2.240)
Living in a rural location before migration	0.310	0.257	0.224	0.266
	(0.463)	(0.438)	(0.418)	(0.442)
Financial situation before migration: good	0.188	0.177	0.159	0.175
	(0.391)	(0.382)	(0.366)	(0.380)
Financial situation before migration: satisfactory	0.354	0.557	0.446	0.443
	(0.479)	(0.498)	(0.498)	(0.497)
Financial situation before migration: bad	0.458	0.266	0.394	0.382
	(0.499)	(0.443)	(0.490)	(0.486)
Illegal status	0.044	0.316	0.104	0.141
	(0.205)	(0.466)	(0.306)	(0.348)
Contact with the HH at home: never/occasionally	0.172	0.067	0.103	0.119
	(0.378)	(0.251)	(0.305)	(0.324)
Contact with the HH at home: at least once a year	0.107	0.046	0.045	0.069
	(0.309)	(0.211)	(0.208)	(0.253)
Contact with the HH at home: at least once a month	0.379	0.354	0.322	0.353
	(0.486)	(0.479)	(0.468)	(0.478)
Contact with the HH at home: every week	0.342	0.532	0.529	0.459
	(0.475)	(0.500)	(0.500)	(0.499)
Reason for migration: study	0.201	0.198	0.093	0.163
	(0.401)	(0.400)	(0.292)	(0.370)
Reason for migration: join the family	0.085	0.076	0.097	0.086
	(0.279)	(0.265)	(0.296)	(0.281)
Reason for migration: improve life conditions	0.288	0.354	0.394	0.343
	(0.454)	(0.479)	(0.490)	(0.475)
Reason for migration: work	0.310	0.325	0.370	0.335
	(0.463)	(0.469)	(0.484)	(0.472)
Intention of permanent migration	0.313	0.312	0.208	0.277
	(0.465)	(0.464)	(0.406)	(0.448)
Destination country: France	0.752	0.286	0.487	0.531
	(0.432)	(0.453)	(0.500)	(0.499)
Destination country: Italy	0.031	0.481	0.135	0.193
	(0.175)	(0.501)	(0.342)	(0.395)
Destination country: other south EU	0.025	0.101	0.003	0.039
	(0.157)	(0.302)	(0.059)	(0.194)
Destination country: other EU	0.063	0.093	0.135	0.096
	(0.243)	(0.291)	(0.342)	(0.295)
Destination country: MENA Region	0.050	0.013	0.204	0.092
	(0.219)	(0.112)	(0.404)	(0.290)
Destination country: rest of the World	0.078	0.025	0.035	0.049
	(0.269)	(0.157)	(0.183)	(0.215)
education before return: no educ	(0.266)	(0.130)	0.121	0.178
	(0.442)	(0.337)	(0.326)	(0.383)
education before return: primary	0.116	0.181	0.221	0.170
	(0.321)	(0.386)	(0.416)	(0.376)
education before return: secondary	0.248	0.380	0.401	0.337
	(0.432)	(0.486)	(0.491)	(0.473)
education before return: tertiary	0.370	0.308	0.256	0.314
	(0.484)	(0.463)	(0.437)	(0.464)
Last LF status overseas: Inactive	0.197	0.063	0.131	0.137
	(0.398)	(0.244)	(0.338)	(0.344)
Last LF status overseas: Unemployed	0.066	0.051	0.042	0.053
	(0.248)	(0.220)	(0.200)	(0.225)
Last LF status overseas: Wage earner	0.649	0.646	0.626	0.640
	(0.478)	(0.479)	(0.485)	(0.480)
Last LF status overseas: Self employed	0.088	0.241	0.201	0.169
	(0.283)	(0.428)	(0.401)	(0.375)
No. of years abroad	18.003	12.008	17.270	16.071
	(16.152)	(9.535)	(11.637)	(13.284)
Financial situation abroad not improved	0.182	0.219	0.114	0.169
	(0.386)	(0.415)	(0.319)	(0.375)
No. of exits	0.157	0.181	0.228	0.188
	(0.364)	(0.386)	(0.421)	(0.391)
Invest in a project upon return	0.175	0.409	0.425	0.326
	(0.381)	(0.492)	(0.495)	(0.469)
N	319	237	289	845

*This category includes those who were married and did not change their status while abroad.

Table 5. Two-Part Model

VARIABLES	Participation	Level
	Marginal effects after probit	Interval regression
Origin Country (Ref. Algeria)		
Morocco	0.191***	-0.283*
	(0.039)	(0.166)
Tunisia	0.188***	-0.180
	(0.038)	(0.143)
Female	0.010	-0.419*
	(0.059)	(0.224)
Married before migration	-0.128*	0.433**
	(0.069)	(0.196)
Married abroad	-0.062	0.198
	(0.046)	(0.135)
HH size before migration	0.007	0.025
	(0.005)	(0.017)
Having children before migration	0.139***	-0.299
	(0.050)	(0.186)
HH size abroad	-0.008	-0.090***
	(0.007)	(0.023)
Living in a rural location before migration	0.154***	-0.055
	(0.037)	(0.118)
Illegally status	0.058	0.681***
	(0.057)	(0.162)
Contact with the HH at home: (ref. never/ occasionally)		
At least once a year	0.167***	
	(0.041)	
At least once a month	0.272***	
	(0.042)	
Every week	0.275***	
	(0.050)	
Migrate for improve life conditions	0.176***	0.199
	(0.053)	(0.229)
Migrate for work	0.188***	0.258
	(0.052)	(0.229)
Intention of permanent migration	-0.035	-0.010
	(0.040)	(0.116)
Education before return (ref. No education)		
Primary	-0.127	-0.171
	(0.085)	(0.170)
Secondary	-0.304***	-0.001
	(0.087)	(0.190)
Tertiary	-0.329***	-0.002
	(0.097)	(0.225)
Last LF status overseas (ref. Inactive)		
Unemployed	0.103*	-0.363
	(0.061)	(0.334)
Wage earner	0.245***	0.0188
	(0.061)	(0.195)
Self employed	0.192***	-0.042
	(0.041)	(0.223)
No. of years abroad	0.009*	0.010
	(0.005)	(0.016)
No. of years abroad squared	-0.0001*	6.99e-05
	(0.0001)	(0.0003)
Financial situation abroad has not improved	-0.279***	-0.310*
	(0.059)	(0.182)
No. of exits	0.0719*	
	(0.039)	
Constant		6.647***
		(0.497)
lnsigma		0.065
		(0.048)
Log-likelihood	-344.694	-750.790
F-test 1stage	35.11	
P-value joint	0.000***	
Observations	845	587

Notes: We control for the countries of destination, financial situation before migration and the reasons for migration (education, to join the family etc). Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 6. Descriptive statistics by type of return

Variables	Decided	Compelled	p-value
Sending remittances	0.698	0.681	0.645
Age of return	44.879	32.974	0.000***
Female	0.113	0.119	0.814
Algeria	0.395	0.318	0.047
Morocco	0.245	0.393	0.000***
Tunisia	0.358	0.288	0.067
Married before migration	0.312	0.213	0.007
Married while abroad	0.363	0.189	0.000***
HH size before migration	6.636	6.990	0.156
Having children before migration	0.265	0.134	0.000***
HH size abroad	3.355	3.572	0.231
Rural location before migration	0.885	0.308	0.000***
Financial situation before migration: good	0.181	0.154	0.372
Financial situation before migration: satisfactory	0.436	0.462	0.512
Financial situation before migration: bad	0.381	0.383	0.977
Enter illegally	0.088	0.308	0.000***
Contact with the HH at home: never/occasionally	0.118	0.124	0.808
Contact with the HH at home: at least once a year	0.077	0.039	0.064
Contact with the HH at home: at least once a month	0.350	0.358	0.850
Contact with the HH at home: every week	0.453	0.477	0.548
Reason for migration: study	0.169	0.144	0.403
Reason for migration: join the family	0.082	0.099	0.449
Reason for migration: improve life conditions	0.336	0.363	0.494
Reason for migration: work	0.335	0.333	0.956
Intended to migrate abroad permanently	0.233	0.418	0.000***
Destination country: France	0.583	0.363	0.000***
Destination country: Italy	0.147	0.338	0.000***
Destination country: other south EU	0.021	0.094	0.000***
Destination country: other EU	0.094	0.099	0.840
Destination country: MENA Region	0.962	0.079	0.476
Destination country: rest of the World	0.055	0.024	0.074
Final education before return: no educ	0.222	0.039	0.000***
Final education before return: primary	0.170	0.169	0.956
Final education before return: secondary	0.017	0.035	0.000***
Final education before return: tertiary	0.322	0.283	0.293
Last LF status overseas: Inactive	0.153	0.084	0.012**
Last LF status overseas: Unemployed	0.027	0.134	0.000***
Last LF status overseas: Wage earner	0.658	0.582	0.049*
Last LF status overseas: Self employed	0.159	0.199	0.197
No. of years abroad	18.486	8.333	0.000***
Financial situation abroad has not improved	0.142	0.253	0.000***
No. of exits	0.173	0.233	0.057*
Invest in a project upon return	0.357	0.228	0.000***
N	*644*	*201*	

Table 7. Two-Part Model by type of return

	Decided		Compelled	
VARIABLES	Participation	Level	Participation	Level
Origin Country (Ref. Algeria)				
Morocco	0.194***	-0.166	0.209**	-0.852**
	(0.040)	(0.186)	(0.092)	(0.362)
Tunisia	0.191***	-0.172	0.249***	-0.756**
	(0.042)	(0.159)	(0.071)	(0.349)
Female	-0.020	-0.392	0.012	-0.638
	(0.068)	(0.252)	(0.114)	(0.473)
Married before migration	-0.094	0.306	-0.336*	0.851**
	(0.077)	(0.219)	(0.182)	(0.420)
Married abroad	-0.059	-0.091	-0.072	1.207***
	(0.051)	(0.155)	(0.120)	(0.311)
HH size before migration	0.008	0.023	-0.009	0.023
	(0.006)	(0.019)	(0.011)	(0.036)
Having children before migration	0.135**	-0.298	0.125	-0.652
	(0.056)	(0.206)	(0.089)	(0.442)
HH size abroad	-0.012	-0.101***	0.009	-0.079*
	(0.009)	(0.029)	(0.015)	(0.040)
Living in a rural location before migration	0.163***	-0.025	0.172***	-0.047
	(0.042)	(0.131)	(0.060)	(0.269)
Enter illegally	0.171***	0.771***	-0.083	0.756**
	(0.043)	(0.195)	(0.123)	(0.313)
Contact with the HH at home: (ref. never/ occasionally)	0.194***	-0.166	0.209**	-0.852**
At least once a year	0.172***		0.171***	
	(0.040)		(0.045)	
At least once a month	0.226***		0.450***	
	(0.050)		(0.090)	
every week	0.228***		0.565***	
	(0.059)		(0.109)	
Migrate for improve life conditions	0.194***	0.249	0.0202	0.269
	(0.055)	(0.259)	(0.160)	(0.477)
Migrate for work	0.244***	0.404	-0.0881	0.099
	(0.052)	(0.258)	(0.177)	(0.497)
Intention of permanent migration	-0.124**	0.0125	0.157**	-0.015
	(0.052)	(0.139)	(0.0714)	(0.228)
Education before return (ref. No education)				
Primary	-0.123	0.004	-0.217	-0.504
	(0.088)	(0.178)	(0.377)	(0.595)
Secondary	-0.306***	0.0816	-0.406*	0.274
	(0.103)	(0.212)	(0.240)	(0.598)
Tertiary	-0.326***	0.206	-0.485	-0.362
	(0.109)	(0.249)	(0.351)	(0.665)
Last LF status overseas (ref. Inactive)				
Unemployed	0.170***	-0.655	-0.097	0.783
	(0.041)	(0.453)	(0.201)	(0.703)
Wage earner	0.311***	-0.167	-0.052	1.119*
	(0.071)	(0.208)	(0.133)	(0.625)
Self employed	0.175***	-0.242	0.131	1.222*
	(0.045)	(0.246)	(0.108)	(0.660)
No. of years abroad	0.006	0.0217	0.050***	-0.094
	(0.005)	(0.018)	(0.016)	(0.061)
No. of years abroad squared	-0.0001	-0.0001	-0.001***	0.003*
	(0.0001)	(0.0003)	(0.0005)	(0.002)
Financial situation abroad has not improved	-0.281***	-0.247	-0.346***	-0.444
	(0.077)	(0.226)	(0.117)	(0.306)
No. of exits	0.025		0.167***	
	(0.048)		(0.057)	
Constant		6.531***		6.275***
		(0.551)		(1.218)
lnsigma		0.031		-0.017
		(0.054)		(0.101)
Log-likelihood	-243.346	-567.301	-67.955	-162.21
F-test 1 stage	17.05		21.34	
P-value joint	0.001		0.000	
Observations	644	450	201	137

Notes: We control for the countries of destination, financial situation before migration and the reasons for migration education, to join the family etc). Standard errors in parentheses;*** p<0.01, ** p<0.05, * p<0.1

Appendix

Table A1. Probability and level of remittances as simultaneous decision

VARIABLES	Interval regression	Ordered probit
Female	-0.441*	-0.164
	(0.249)	(0.159)
Married before migration	0.136	-0.022
	(0.227)	(0.151)
Married abroad	0.093	0.015
	(0.158)	(0.106)
HH size before migration	0.039*	0.0279**
	(0.020)	(0.013)
Having children before migration	0.017	0.128
	(0.221)	(0.147)
HH size abroad	-0.100***	-0.057***
	(0.028)	(0.018)
Living in a rural location before migration	0.220	0.191*
	(0.149)	(0.100)
Enter illegally	0.772***	0.474***
	(0.200)	(0.135)
Contact with the HH at home: (ref. never/ occasionally)		
At least once a year	0.329	0.318
	(0.294)	(0.195)
At least once a month	0.551**	0.486***
	(0.214)	(0.141)
Every week	0.727***	0.544***
	(0.216)	(0.142)
Migrate for improve life conditions	0.563**	0.474***
	(0.247)	(0.167)
Migrate for work	0.607**	0.530***
	(0.248)	(0.168)
Intention of permanent migration	-0.063	-0.029
	(0.136)	(0.091)
Education before return (ref. No education)		
primary	-0.366*	-0.266*
	(0.214)	(0.144)
secondary	-0.350	-0.324**
	(0.238)	(0.159)
tertiary	-0.395	-0.344*
	(0.274)	(0.182)
Last LF status overseas (ref. Inactive)		
Unemployed	0.008	0.178
	(0.359)	(0.226)
Wage earner	0.654***	0.505***
	(0.211)	(0.138)
Self-employed	0.607**	0.474***
	(0.251)	(0.166)
No. of years abroad	0.028	0.019
	(0.018)	(0.012)
No. of years abroad squared	-0.0001	-0.0001
	(0.0004)	(0.0002)
Financial situation abroad has not improved	-0.865***	-0.680***
	(0.193)	(0.125)
No. of exits	0.0071	0.069
	(0.151)	(0.101)
Cut1 Constant	4.346***	0.663*
	(0.580)	(0.382)
Cat2 Constant		1.053***
		(0.383)
Cat3 Constant		1.714***
		(0.384)
cut4 Constant		2.170***
		(0.385)
lnsigma	0.362***	
	(0.0498)	
Log-likelihood	-972.947	-1147.825
Observations	845	845

Notes: We control for the countries of origin and destination, financial situation before migration and reason for migration (education, to join the family etc). Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

Table A2. Heckman sample selection model

VARIABLES	Participation	Level
	Marginal effects after probit	Interval regression
Origin Country (Ref. Algeria)		
Morocco	0.191***	-0.242
	(0.039)	(0.203)
Tunisia	0.188***	-0.138
	(0.037)	(0.178)
Female	0.010	-0.424*
	(0.059)	(0.224)
Married before migration	-0.128*	0.409*
	(0.069)	(0.210)
Married abroad	-0.061	0.190
	(0.046)	(0.135)
HH size before migration	0.007	0.026
	(0.005)	(0.016)
Having children before migration	0.138***	-0.270
	(0.050)	(0.181)
HH size abroad	-0.008	-0.091***
	(0.007)	(0.003)
Living in a rural location before migration	0.154***	-0.030
	(0.037)	(0.138)
Enter illegally	0.058	0.691***
	(0.057)	(0.163)
Contact with the HH at home: (ref. never/ occasionally)		
At least once a year	0.167***	
	(0.042)	
At least once a month	0.271***	
	(0.042)	
Every week	0.274***	
	(0.050)	
Intention of permanent migration	-0.035	-0.015
	(0.040)	(0.899)
Education before return (ref. No education)		
Primary	-0.127	-0.179
	(0.085)	(0.170)
Secondary	-0.304***	-0.021
	(0.087)	(0.194)
Tertiary	-0.329***	-0.029
	(0.097)	(0.232)
Last LF status overseas (ref. Inactive)		
Unemployed	0.102*	-0.350
	(0.061)	(0.335)
Wage earner	0.244***	0.061
	(0.061)	(0.216)
Self employed	0.200***	-0.010
	(0.041)	(0.234)
No. of years abroad	0.009*	0.011
	(0.005)	(0.016)
No. of years abroad squared	-0.000*	0.000
	(0.000)	(0.000)
Financial situation abroad has not improved	-0.278***	-0.361
	(0.059)	(0.216)
No. of exits	0.071*	
	(0.039)	
Inverse mills ratio		0.142
		(0.344)
Constant		6.483***
		(0.616)
lnsigma		0.065
		(0.048)
Log-likelihood	-344.694	-750.690
Observations	845	587

Notes: We control for the countries of destination, financial situation before migration and reasons for migration. Bootstrapped standard errors in parentheses (500 repetitions used to estimate level of remittances). Standard errors in parenthesis: *** p<0.01, ** p<0.05, * p<0.1