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Essays on the Impact of Remittances on the Recipient Countries

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ABSTRACT

This thesis contains three essays which aim to contribute to the better understanding of the relevance of migration in the origin country with a special focus on remittances, the most consistent outcome of migration. The first essay analyses the impact of remittances on household expenditure behaviour; the second examines the role of remittances and migration on the occupational choice of the household members left behind; and the third essay investigates the remittances behaviour of return migrants during their period abroad. The three different empirical analyses give us some indication of the role of migration and remittances in the process of development and show us that the context of analysis influences substantially how migration and remittances affect the outcomes of interest. In particular, the first chapter, using data from Senegal and employing propensity score matching as well as Working-Leser model, investigates separately the effects of domestic and international remittances on several consumed and investment goods. The results show that in the decision on how to allocate expenditure, remittances are treated just like any other source of income. Aside from being used for covering daily needs, the analysis does not support any hypothesis of "dependency" effect of remittances on those left behind. The second chapter uses data from Tajikistan and using control function approach shows that remittances make an important contribution in generating employment opportunities for those remaining in the country. Men left behind have preferences for self-employed activities. This is likely to have a positive impact on the growth and development in Tajikistan and the results obtained are likely to have policy implications for other developing countries as well. Finally, in the third chapter special attention is given to the remittance behaviour of return migrants during their migration experience. Returnees can have an important impact on growth and development on their origin countries. The essay analyses the decision and the amount remitted by those who returned to their countries of origin. Using a survey data of return migrants collected in Algeria, Morocco and Tunisia, the empirical analysis suggests that remittance behaviour depends on a combination of different individual characteristics as well as duration of the migration experience and form of migration. The survey allows for identifying two types of returnees - decided or compelled - and the type of return can help fully understand the determinants of monetary transfers to the home country during the period spent 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.

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List of Abbreviations

AMP	African Migration project
ATT	Average Treatment Effect
CFA	West African CFA Franc
CIS	Commonwealth of Independent States
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GLM	Generalized Linear Model
IOM	International Organization for Migration
LSMS	Living Standards Measurement Study
MENA	Middle East and North Africa
MIREM	Migration de Retour au Maghreb
MLE	Maximum Likelihood Estimation
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary least squares
PSM	Propensity score matching
SSA	Sub-Saharan Africa
TJS	Tajikistani Somoni
TLSS	Tajikistan Living Standards Survey
USD	United States Dollar

CHAPTER I

INTRODUCTION:
A GENERAL VIEW ON MIGRATION AND REMITTANCES

1.1 The relevance of Migration and remittances

Almost 3 per cent of the world population lives outside their country of birth (World Bank, 2011). The figure by itself is not impressive; those who live outside the country of origin represent a small percentage of the world population. However, migration touches every country in the world as possibly each one is involved in the migration process, either as sending, transit and/or receiving country. This chapter will give a general view on why migration is important and why it attracts so much attention of researchers and policy makers. I will then focus on remittances, the flow of private transfers that migrants send to their origin countries and which represents the most consistent outcome of migration.

Migration policy, multilateral and bilateral agreements, [1] guest worker programmes all give us a first idea on how migration challenges both sending and receiving countries. The mobility of people interacts with political, social, economic and security aspects of a country and measures to deal with this phenomenon are needed.[2] Overall, people move – internally or internationally – because of poverty,[3] inequity in the distribution of resources, services and opportunities or to escape from conflict, violence and natural disasters. The majority of migrants cross borders in search

[1] The OECD (2004) identifies the existence of 176 bilateral agreements (Hanson, 2010).
[2] There are still strong obstacles to bilateral and multilateral cooperation: countries perceive migrations differently and they have different interests. The common practice sees the destination countries protagonist in designing, monitoring and enforcing policies on human flows.
[3] Even if migration is often related to poverty those who migrate are less likely to be the poorest. This may be because migration involves costs which the poorest are not able to afford (e.g., transport costs, costs of acquiring appropriate documentations, developed networks abroad); see Castaldo *et al.* (2005) for discussion and literature.

of better economic opportunities and labour migration dominate the human mobility (IOM, 2013).

Labour migration is not a new issue though globalization has increased the mobility of labour in the past two decades and today international labour flows are seen as integral part of the process of globalization (Hanson, 2010). The larger flow of labour migration is from "South" (low- and middle-income countries) to "North" (high-income countries) and according to the World Bank in 2010 it represented 45 per cent of the total followed by South-South migrations (35 per cent), North-North (17 per cent) and North-South (3 per cent) (IOM 2013).

There is a large debate on whether migration leads to positive or negative outcomes both in sending and destination regions in terms of growth and development. Visible signs of the movement of people cross border are changes in the population structure and reorganization of the labour market; exporting and importing labour countries experience these changes in opposite directions. On the one hand, in the destination regions, the inflow of immigrants may create tensions with the functioning of the welfare state; moreover, the presence of immigrants affect the labour competition inside the country as well as the wage levels and distribution of income. On the other hand, the sending countries, which often suffer from a high level of unemployment, see through migration a reduction of the labour supply, which represents a relief for the pressures in the local job market. However, the phenomenon of brain drain, the movement of skilled people, is among the concern of emigration as it slows down the economic growth of poor economies. Moreover, there are several consequences of emigration for the family members left behind: the migration process affects spouses, children and elderlies in both negative and positive ways.

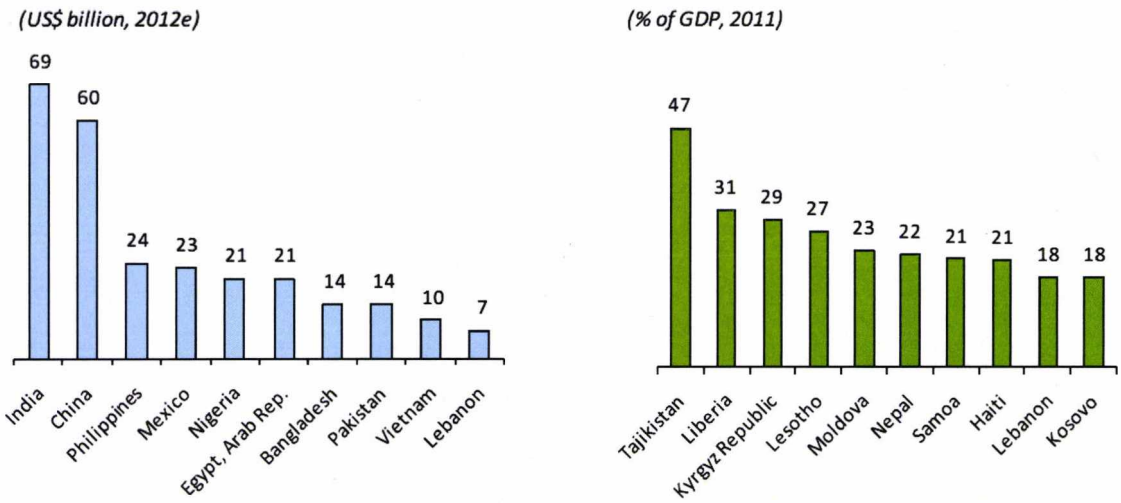
In terms of household labour supply, the first immediate consequence of emigration is the loss of a member contributing to the household income, which might force the remaining members fulfil the 'production' gap. However, the contrary can also happen if the household, in a second stage, receives transfers from the member abroad and those left behind decide to decrease their participation in the labour market. Moreover, migration may modify the supply also in term of the occupational choice of those left behind: individuals may decide to incur in more or less risky activities because the migrant transfers knowledge and capitals which can be used to overcome

financial constraints. Migrant's remittances compensate for the absence of a family member. If we consider labour as an export then remittances are the payment for exporting labour services that return to the country of origin (Taylor, 1999). The migration of a household member modifies the family structure and the organization of the different roles and duties inside it. If it is head of the household who migrated then the spouse (generally wife) may take a more active role in the household as well as in the society. On the contrary, the absence of a parent may put children under emotional stress as they receive less supervision and care and they may be forced to contribute to household work with negative consequences for their learning or education decision. However, successful migration can change the expectation of returns to education and result in an increase in child schooling – migrant's monetary transfers may decrease child labour and make possible more investment in education. Overall, migrants can bring more awareness of the importance of health care and education and remittances can alter the household consumption decision directing expenditure to human and capital outcomes. Given the different ways in which migration can impact those left behind, more effort is required from researchers and policy makers to understand the role of migration in developing economies and to ensure that it leads to positive effects for those remaining in migrant's country of origin.

Remittances are not a new outcome of migration, though the lack of reliable data has been a hindrance in evaluation of their impact on recipient households, on communities and countries of origin. It is only recently that the interest on the use of remittances has increased thanks to the effort in providing more information and conducting household surveys which include sections on migration and remittances. In particular, recently, the World Bank has launched several projects for understanding reasons and impact of migration in developing countries. The World Bank's Reports: Global Development Finance 2003 – which includes Dilip Ratha's chapter on "Workers' Remittances: An important and Stable Source of External Development Finance" - and Global Economic Prospects 2006 contribute to stress the role that remittances can play in the recipient countries. Remittances are characterized by their volume, growth and stability. The official flow of money transfers from migrants to their countries of origin almost tripled between 1998 and 2008 consisting of $338 billion to developing countries (Ratha *et al.*, 2009). The World Bank reports that official

remittances to developing countries were estimated to be $401 billion in 2012, growing by 5.3 per cent from 2011 and increased 12.1 per cent between 2010 and 2011. In many countries, they exceed official development assistance (ODA) and although the top recipients of remittances are large countries, for smaller low-income countries remittances represent a higher share of their GDP (Figure 1.1). Remittances are therefore considered a relatively stable source of foreign exchange; while capital flows rise during economic boom and fall in bad times, remittances respond less to economic cycles and are quite stable over time, though there is some evidence that they are countercyclical. Given the above peculiar characteristics the large flows of migrant earnings into migrant sending areas have inspired researchers to carry on surveys to quantify remittances, their use and their impact on the local economies.

Figure 1.1: Top 10 recipients of migrant remittances and as a share of GDP*



*Data on remittance inflows and GDP are for 2011; the latest year for which official GDP data is available.
Source: World Bank Development Prospect Group (2013)

The interest in how remittances are used by the recipient households and whether they can promote development over the long-run are the motivation of this thesis. If migrant remittances contribute to household income, they may have multiplicative effects on incomes, employment and production in migrant sending economies. Therefore, crucial for the multiplicative effects of migrant's transfers are the design and implementation of policies to use productively the outcome of migration and

avoid the possibility that remittances fuel a cycle of household dependency on migration.

Adams (2011) and Antman (2013) present a literature review on the impact of remittances on the developing world. They discuss the results of several studies conducted using household survey data in different contexts. Remittances touch several decisions that households and their members take and evidences show contrasting findings in how migrant's transfers interact with relevant outcome variables concluding for a productive use or not of remittances. This thesis aims to contribute to the literature on the economic impact of remittances on the countries of origin – Senegal, Tajikistan and Maghreb countries (Algeria, Tunisia and Morocco) – using recent survey data in contexts where migration and remittances are relevant and the previous lack of data prevented research. The research questions explored are:

- Do remittances affect household expenditure decisions? Is the source of remittances, domestic or international, important? (Chapter 2)
- Do migration and remittances "orientated" the occupational choice of the household members left behind? (Chapter 3)
- Given the potential contribution of remittances to the development of the recipient countries, the focus goes to: what determines the remittance behaviour in the case of return migrants during their previous migration experience? Do various degrees of willingness to return, 'decided' or 'compelled', affect the remittance behaviour? (Chapter 4)

The introductory chapter is structured as follows. The next section - 1.2 - considers the methodological issues common to the studies on migration and remittances and the potential empirical solutions to these various methodological problems. Section 1.3 discusses the relevance of remittances on household and its members' decision focusing in particular on expenditure behaviour and occupational choice of those left behind; as well as whether and how remittances promote development. Section 1.4 presents the theoretical and empirical literature on migrant's remittances and how the form of migration – permanent versus temporary – contributes to explain the remittance behaviour. Briefly, the section summarizes the findings of

Chapter 4 which analyses the remittance behaviour for a sample of return migrants. Finally, at the end of each section I discuss the contribution of each empirical analysis to the literature.

1.2 Methodological issues

1.2.1 The role of unobservable variables

The first problem that researchers face in conducting a study on the effect of migration on the outcome of interest is the endogeneity of the migration itself. First of all, individuals and households simultaneously take several decisions: a household may decide to send a family member abroad and at the same moment chooses the household consumption behaviour, the education of the young members and possibly the supply of labour. So, at the same moment individual and household characteristics determine the decision on migration and the choice of other outcomes which migration may contribute to determine as well. The problem arises because the decision on migration and remittances are not only explained by individual and household characteristics but unobservable factors play an important role in determining them. For example, characteristics like the risk averseness of the household affect the migration decision of a household member and at the same moment it contributes to explain the consumption pattern, the choice to invest in children education or the decision to start a small business. It is difficult to isolate the impact of remittances on the outcome of interest from unobservables and determine whether the effect of remittances is not "contaminated". The risk is to over-estimate or under-estimate the impact of remittances on the outcome variable as the observed effect captures also the role played by unobservables. Therefore results can be biased.

When researchers investigate the decision to migrate and remit they need to take into account the problem of selection bias, which is also linked to omitted or unobservable variables. As argued by Heckman (1979), sample selection bias may arise for two reasons: first, there may be self-selection of the individuals or units under investigation; second, selection may arise from the way data are collected.

For example, the questions: "who migrates/returns?" "who remits/how much?" need to consider the selectivity process of migration. Selection can occur in terms of both observed and unobserved skills and/or conditions. First, if migration is costly,

households with higher level of income can afford to send one of their members abroad and also pay for the education of their children. Relatively wealthier households can also spend more on health and/or be involved in entrepreneurial activities as they are less likely to be credit constrained. It is therefore difficult to identify the effect of remittances by just comparing the characteristics of migrant and non-migrant households as it will just pick up the effect of socio-economic status. Second, individual ability or motivation, variables which are not possible to measure, can contribute to determine who migrates; the migrant's performance in the host country labour market; the amount a migrant remits etc. Though literature argues that migrants are positively self-selected, there is still a possibility of negative self-selection, especially if the counterfactual is considered, i.e., what would have been the performance of the non-migrants had they migrated (see, for instance, Piracha and Vadean, 2010).

Another problem common to observational studies is reverse causation, i.e., remittances may help to reduce poverty in the developing world though the level of poverty may also influence the amount of remittances received. In the case of cross-sectional data we may not observe the household conditions at the start of migration and what we observe are the circumstances after the migration process took place. It is difficult to conclude what causes what. Only longitudinal data, where researchers can observe circumstances before and after the migration event, help to define the causality between outcomes of interest. Unfortunately, panel data are often not available for the migration analysis and research is conducted using cross sectional data with all the consequence limitations.

1.2.2 Empirical solutions

The standard approach to investigate the impact of migration M on the outcome of interest Y is to specify a linear regression model for the individual or household i over a set of observable and exogenous characteristics X.

$$Y_i = \beta M_i + \gamma X_i + \varepsilon_i \tag{1.1}$$

The concern is that endogeneity and self-selection into migration leads to biased estimates because

$$E(M_i \varepsilon_i | X_i) \neq 0 \tag{1.2}$$

Several solutions to this problem are being proposed by the empirical literature.

The best solution would be to use a randomize experiment where for example migrants are randomly selected by a lottery system (see McKenzie *et al.*, 2010; McKenzie, 2012; Mergo, 2012). When migration is a random process based on the luck of being selected then it is possible to evaluate the pure effects of migration on those left behind. Unfortunately, the possibility to use randomized experiment is quite limited and researchers need to use other solutions. Yang (2008) uses a natural shock: the change in the exchange rates before and after the 1997 Asian financial crisis as a shock to migrant incomes in order to analyze the impact of the appreciation of the migrant's currency on investments in the Philippines. Again, few of these types of shock actually exist.

Panel data make possible to deal with most of the issues mentioned above. The possibility to have repeated observations over two or more periods (pre-migration and post migration periods) allows taking first differences between explanatory variables which helps correct the potential bias that arises from endogeneity, selection and omitted variables. However, again, few studies had the possibility to take advantage from panel data (Funkhouser, 2006; Yang, 2008; Adams and Cuecuecha, 2010b). Most of the available datasets on migration and remittances are cross-sectional and information on individuals and household conditions before and after migration are not available.

The majority of studies on migration suffer from several data issues and information is often limited. Under these circumstances, the common solution is to use an instrumental variable approach. It consists of finding a variable, an instrument, which is correlated with migration and/or remittances– relevance condition – but, is not correlated with the outcome of interest other than through migration – exogeneity condition. The instrument relevance is testable while instrument exogeneity needs to be argued. Through a good instrument it is possible to split the variation in migration and use only that part uncorrelated with the error terms. However, finding a good instrument is challenging.[4]

[4] McKenzie and Sasin (2007) present a list of instrumental variables used in the migration literature.

Another possible solution to address endogeneity, in the absence of suitable instruments, is to use propensity score matching (PSM) techniques. For example, understanding the impact of migration and remittances on poverty, household consumption and/or child education requires comparing the situation under migration with the one without migration. The same unit (individual or household) should be observed in the two situations to establish how migration affects the outcome variable. The problem is that it is not possible to observe simultaneously someone in two different states. Propensity score matching uses similar characteristics to match units under different status and to create counterfactual groups. The treatment group is identified with those units experiencing migration (a family member is a migrant) and/or receiving remittances; the control group contains those units who do not experience migration and/or receive remittances. The PSM approach helps to reduce the selection bias due to the existence of observed differences in socioeconomic characteristics between recipient and not recipient households (Clément, 2011). However, it does not mean that unobservables do not play any role in explaining differences between the two types of households. Results may be sensitive to the presence of unobservables.

McKenzie *et al.* (2010) show that among the non-experimental techniques a good instrumental variable works as second best in reducing the bias from unobservables; on the contrary a poor instrument performs as worse estimate. Also propensity score matching performs comparatively well. McKenzie and Sasin (2007) suggest that when natural or randomized experiments do not exist and a good instrument is not available, the researcher should conduct a sensitivity analysis comparing various methods and/or various instruments.

1.3 Theory on remittance motivations

Remittances represent a flow of wealth to the sending countries and their implications on growth and development has spawned a voluminous literature. Before presenting the different theories and empirical evidences on the use of remittances, this section takes a step back presenting two important research questions, which can help understand how migrants' transfers are used. These are: "what are the motivations behind remittances?" and "which of the migrants' characteristics contribute to the

decision and level of such transfers?" The literature provides different reasons that explain remittance behaviour but no consensus has been reached as what really motivates migrants to send transfers to their origin countries.

Rapoport and Docquier (2006) present an excellent review on the theoretical and empirical literature on migrant remittances. And this section discusses some of the most important remittance hypotheses. The researchers distinguish between individualistic motives (altruism, self-interest, exchange and the strategic motives) and two types of familial agreements (investment and insurance hypotheses).

1.3.1 Individualistic motives: altruism and self-interest

Lucas and Stark (1985) are identified as the pioneers who started the current debate on the motivations to remit. They discuss three possible reasons to remit – altruism, self-interest and a more tempered point of view combining these two extremes. In the first case, the migrant cares about the family members left behind and he derives his utility from the utility of those persons at home. A migrant therefore enjoys remitting because this will subsequently increase his utility. The altruistic inclination to remit is not easy to test. Funkhouser (1995) proposes a behavioural model of remittances based on altruism, with the following testable implications: emigrants with higher earnings potentially remit more; low income household receive more; a positive relationship between remittances and the ties with the family left behind exists; migrant's intention to return should increase remittances; remittances should decrease with the number of emigrants from the same household.

The pure self-interest is presented by Lucas and Stark (1985) as the opposite extreme of the altruistic case of the willingness to remit. Under the pure self-interest model, the migrant cares just about himself and he remits to achieve personal goals; inheritance, investments or return intentions are purely selfish motivations.

Both pure altruism and pure self-interest alone may be inadequate to explain why remittances take place. Therefore, Lucas and Stark present a third option identified as tempered altruism or enlightened self-interest that sees remittances as part of an arrangement between the migrants and the family at home in which both parties benefit from the implicit contract. They explored the three remittances hypotheses using data from the National Migration Study of Botswana. The analysis supports the alternative

theory of tempered altruism or enlightened self-interest; the implicit contract between the migrant and his family can find its justification in the repayment hypothesis or in the willingness to spread risk. Different theories based on family arrangement between migrant and his family have been developed: family loan arrangement; exchange theory; insurance motive.

1. 3.2 Exchange theory and strategic motive

Remittances are justified by the exchange theory as a price to pay in exchange of some services: the scenario that appears is nothing more than a market transaction between two parties provided by the recipient household, which may consist in taking care of the migrants assets (land, cattle) or relatives (children, elderly parents) during the absence from home. The temporary nature of migration, or at least the intention to return, may be the reasons to buy those services. In such exchange setting, the division of the pie depends on the bargaining power of the two parties (Clark and Drinkwater, 2007). Remittances could also be used as a strategy to encourage or prevent migration. Migration is a precondition for remittances but at the same moment remittances can influence further migration. For example, Stark (1999) suggests that remittances may be part of a strategic interaction aiming at a positive selection among migrants: high skilled migrants try to prevent the emigration of low skilled workers. The higher skilled migrants try to protect their wage from being contaminated by the presence of low skilled workers in the same pool and remittances are used in order to maintain them at home (the reason to remit is a pure self-achievement). So, the intention to emigrate should be lower among household members who receive remittances than among those who do not receive any transfer. This idea contrasts with the positive effect of remittances in the intention of those left behind to emigrate. Remittances contain information on the destination countries and give the possibility to reduce the uncertainty of leaving the home country (see Van Dalen *et al.*, 2005). Stark and Wang (2002) arrive at the opposite conclusion: the first mover is a high skilled person who, with remittances, supports the migration of low-skilled workers.

1.3.3 Remittances as part of a family agreement: investment (family loan arrangements) and insurance hypothesis

The repayment hypothesis has long been discussed in the remittance literature (Lucas and Stark, 1985; Cox and Jimenez, 1992; Poirine, 1997; Brown and Poirine, 2005) and in the empirical studies on the determinants of remittances. Children, from the time they are born until they become adult, contract an informal debt with their parents in terms of attention, care, money to provide their education or other needs. In the second period, the adult children will pay back the loan by providing time and money to the parents. If the adult children decide to emigrate, remittances enter in the model as a form of repayment due to the family at home. The amount of transfer should depend on the magnitude of the loan received. A higher investment in children's education should be rewarded by a greater flow of remittances. When remittances occur as repayments of loans on investments in education and/or migration costs, the familial implicit contract aims at increasing family income rather than at reducing uncertainty (as in the case of the insurance hypothesis). The investment motive may be seen as a particular exchange of services in the context of imperfect credit markets but within a framework containing social as well as intergenerational elements.

In the insurance mechanism, migration is a calculated portfolio choice and risk diversification against possible income shocks. Amuedo-Dorantes and Pozo (2006) stress the part of remittances transferred to buy two types of insurance: family-provided and self-provided insurance. In the first case, remittances are added to the family's income for current consumption; the migrant expects to receive assistance in case of unemployment or retirement in the home country. In the self-insurance case, the migrant will insure himself by the accumulation of precautionary savings that are sent home to buy assets. The precautionary savings motive arising from uncertainties (migrant's future income and legal status) is supported by Piracha and Zhu (2012).

Even if the literature gives a complete picture on the possible motivations behind remittances, disentangling different motives to remit is not easy and the limited datasets available makes it impossible to arrive at any decisive conclusion on the underlying motives for remittances. Moreover, thinking of one motive as a possible cause of remittances does not seem realistic. A combination of different reasons may coexist together and the exact mixture of them may vary over time and place (Rapoport

and Docquier, 2006). The dominance of one motivation over another may depend on individual and household characteristics, migration context and nature of migration. All of these variables are in play and their interaction determines the pattern of remittances.

1.3.4 Empirical studies

The analysis of the determinants of remittances should start by considering the migrants and family's characteristics: gender, marital status, children in the household, level of education, earnings etc. are important aspects to consider when looking at this puzzle of remittance behaviour. The literature has commonly observed that having a large household left behind positively affects the probability to remit; conversely the size of the household abroad has a negative impact on the same probability and level of remittances (Mahuteau *et al.*, 2010). Dustmann and Mestres (2010) find that remittances behaviour is strongly affected by the location of the family.

The relationship between remittances and migrant's earnings, labour force status and level of education have been analysed widely but the debate on the relationship remains open. The theory and empirical findings support the view that migrants with higher earnings potentially remit more. Alternatively, the level of the household income has to be considered under different remittance hypotheses. The altruistic model as well as the strategic hypothesis predicts that low income households receive more remittances compared to the rich ones. A different conclusion is supported by the exchange and the investment models for which an increase in the recipient's income may raise the amount transferred. The insurance model leaves the relationship ambiguous.

An open question is if the level of migrant's human capital plays a direct role in determining the income level. In the context of remittances, it is interesting to investigate if skilled and unskilled migrants behave differently in terms of remittances decision and amount. Presumably, skilled migrants earn more and it increases the potential amount that they can remit. But not all the empirical investigations support this view and therefore the relationship between education and remittances is ambiguous.

Faini (2007) finds that better educated migrants remit less. This can be explained firstly by the fact that skilled migrants come from wealthier families and there is less

pressure and incentive to remit; second, better educated migrants tend to spend more time in the host country with the consequence of weaker ties with the homeland and the easier integration that they face decreases the incentive to return home. They reunite with their family in the host country and all of these factors lead to remit less. Dustmann and Mestres (2010), Mahuteau *et al.* (2010) show results in line with Faini (2007). Bollard *et al.* (2011) arrive at a different conclusion. Using micro-data from 11 destination countries, they find a mixed pattern between education and likelihood to remit and a strong positive relationship between education level and the amount remitted. The argument in favour of a positive relationship between education and remittances is not only that skilled migrants earn more and they have a higher capacity to remit, but also the repayment of the family loan hypothesis supports their findings. Under the investment model, not only the migrant's education but also the migration cost are financed by the parents at home and the repayment of the loan through remittances is expected to depend on the magnitude of the loan. Earlier, Lucas and Stark (1985) found that years of schooling have a positive effect on the level of remittances. Funkhouser (1995) finds that years of schooling have an adverse effect on the likelihood of remitting but a positive effect on the amount transferred. Finally, no impact of education on remittances has been found in the case of the Philippines (Rodriguez, 1996) and in the Pacific Island (Brown, 1997). The theoretical background supporting both the directions of the link between remittances and education suggests that education does not enter directly as a determinant of remittances (Bollar *et al.*, 2010) but many other variables may have to be mixed together to help understand the role that education plays in the determination of remittances.

Different remittance behaviour is also shown by those who entered the host country legally compared to those who entered without proper documentation. For instance, Markova and Reilly (2007) investigate the role of the legal and illegal status for a sample of Bulgarians in the city of Madrid. They find that migrants with legal status remit less than the undocumented migrants. The insurance motive helps to understand the different behaviour. The migration experience is characterized by uncertainty; migrants are risk adverse individuals and the level of risk is higher for illegal migrants who are therefore not only more likely to remit but remit higher amount

as well (Amuedo-Dorantes and Pozo, 2006) as the transfers represent a form of insurance against the risk of being apprehended and repatriated.

Piracha and Zhu (2012) stress the link between immigrants' saving behaviour and level of uncertainty in the host country. In fact, uncertainty about future earnings and legal status is a key component in determining the level of precautionary savings. In general, saving and remittance levels decrease with the degree of risk faced by the immigrant in the host country.

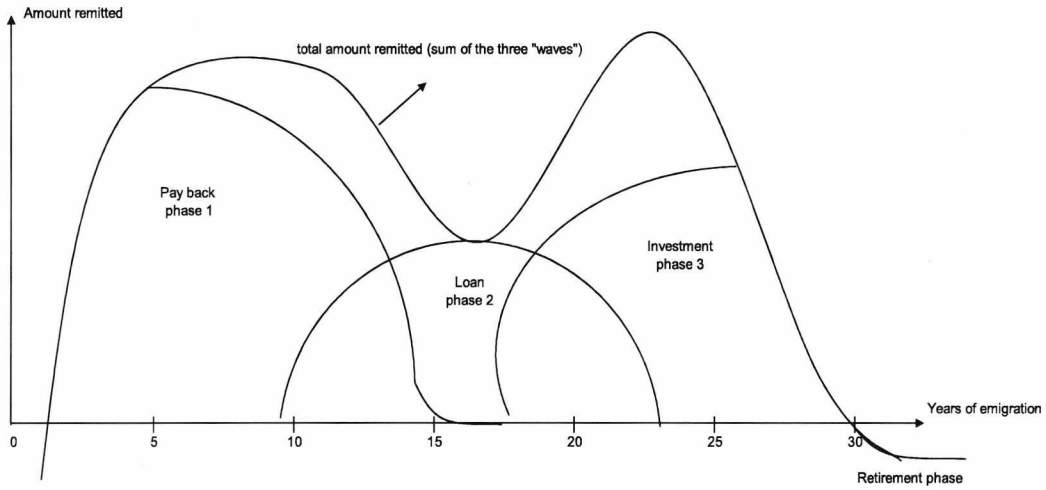
Also, the empirical evidence shows that the length of stay abroad influences migrants' remittances to the household left behind. The sign of the relationship is not easy to identify. On the one hand, more time abroad represents gains in experience and higher level of earnings which implies the possibility to remit more. On the other hand, the time spent away from the origin country weakens the ties with the household members and a lower level of remittances may be expected. The duration of absence has different impacts on remittances depending on how the two effects combine.

Funkhouser (1995), examining family relationship and the period of time spent abroad in the Central American Region, concludes that a distinction has to be made between El Salvador and Nicaragua. He finds that in El Salvador, family members who stay abroad for a long period are more likely to remit and also remit more than recent arrivals but the reverse happens for non-family members (who are not part of the immediate family), i.e., as the length of stay abroad increases they tend to be less likely to remit and they remit less than recent non-direct family members. No difference in behaviour is found in the case of Nicaragua as both family and non-family members show a lower propensity to remit as the length of stay abroad increases. Funkhouser argues that the differences in the remittance pattern between migrants - family members - with the same observables characteristics from the two different countries depends on non-observable variables such the attachment to the country of origin. Salvadorian migrants show stronger feelings for their country and have a higher propensity to return home compared to those from Nicaragua, which explains why they remit more.

Under the framework of the family implicit loan, Poirine (1997) suggests an M-shaped relationship between remittances and length of residence. The total amount remitted is the sum of three waves that may overlap somewhat for some periods. The first one is the pay-back wave and the length of the pay-back period should be more or

less equal to the loan period. In the second period the migrant becomes the lender: remittances support children's education and the needs of the younger family members. The money borrowed by the younger members will be paid back in a second period when the educated children will be migrants themselves. The third wave is the investment wave which is generated by the intention to return and invest in the home countries when the migrants is close to the retirement (Figure 1.3).

Figure 1.2 – A theoretical remittances function in the "intend to return" case



In the no return case, remittances should fall gradually as the family reunites in the host country and the third wave disappears (the curve as peaks around 7 and 25 years away period). Markova and Reilly (2007) report an inverse-U relationship between remittances and time. The turning point is around 9.6 years and it is consistent with the remittance decay hypothesis. Earlier, Brown (1997) does not find any evidence that the remittance function tends to decline as the time spent abroad increases and he concludes that for Tonga and Western Samoa migrants the remittance decay hypothesis is invalid.

On the other hand, some studies report that the longer the migrants stay in the host country the higher is the probability and level of remittances (Amuedo-Dorantes, 2006; Mahuteau *et al.*, 2010). In the case of the Philippines, Rodriguez (1996) finds that years since migration have a positive effect on the probability but not on the level of remittances. Earlier, Lucas and Stark (1985) find that the duration of absence from the origin country negatively affects remittances but not within the first 5 years, during

which remittances continue to rise. Also, Glystos (1988) finds that as the time since migration increases for Greek immigrants in Germany, with the plan to return home, they remit more than the Greek immigrants in Australia and the United States, who do not have the same illusion.

What the empirical findings suggest is that the impact of the duration of staying abroad on remittance decision and level cannot be analysed separately from the migration plans. Miotti *et al.* (2010), studying the determinants of remittances to Southern Mediterranean Countries, argue that the analysis of the impact of the period spent abroad on remittances cannot be separate from the history of migration. And following Funkhouser (1995), they stress the role of unobservable characteristics as attachment feelings and intent to return to explain the impact of observable characteristics on the remittance patterns.

1.3.4.1 The importance of the form of migration: temporary versus permanent

Glytsos (1997) argues that the motives for sending remittances as well as the amount and regularity of those transfers are all strongly related to the aim of migration. The distinction between permanent and temporary migration is fundamental for understanding the remittance behaviour and the nature of the transfers: gifts, in the case of permanent migration or obligatory income flows, in the case of temporary migration. Permanent migrants aim at achieving an economic and social integration in the host country as they work to have a better life outside their home country. In this case remittances are characterized by a higher degree of autonomy (there is no element of obligation), in which case altruism motive may be a prevalent component.

Different remittances behaviour is shown by temporary migrants: with the decision to return home they plan to use the experiences gained overseas to improve their life upon return. Migration is aimed at saving as much as possible and generating a flow of money to the origin country that constitutes a regular burden on the migrant. The decision to spend a part of the life cycle in a foreign country may be an individual or family strategy. In this context it is difficult to believe that remittances are the result of a spontaneous gesture. The obligatory nature of the transfers in the case of temporary migration is stressed by Glytsos (1997). Dustmann and Mestres (2010) find that temporary migration plans are associated with a 13.4 percentage point higher

probability to remit. The findings suggest that remittances constitute an integral part of the emigration repatriation decision-making process (Glytsos, 1988). This requires reflection on the cause-effect relationship between migration and remittances: are remittances the consequence or the cause of migration? The answer is not immediate. Usually, remittances are treated as a production of migration but the relationship can be inverted if we think that migration can occur for a previous remittances plan: the willingness to improve life at home and the consequent remittances intention may trigger migration (Glytsos, 1988). Moreover, past remittances can contain important information on the receiving country that helps to reduce the uncertainty of the migration process. Individuals living in a family that receive remittances are more likely to migrate than individuals living in a family that does not receive anything (Van Dalen *et al.*, 2005). Using a large household survey data from Moldova and employing simultaneous equations model, Piracha and Saraogi (2013) show that there exists a dual causality between receipt of remittances by non-migrants and their migration intentions. They add a novel element to the empirical literature by specifying the mechanism behind the link between remittances and migration. They find evidence that remittances not only relieve credit constraints in the home country but also act as a signalling device of success in the host country.

1.4 Impact of remittances on household consumption decisions and occupational choices of those left behind: implications on development.

1.4.1 Remittances and effects on household expenditure behaviour

Individual and household preferences for consumption are limited by income constraints, which is an important issue in many developing countries where it consistently affects household expenditure behaviour. Many households are forced to sacrifice some types of expenditure and often maintaining consumption above the subsistence level is challenging. Since consumption responds to income changes, the extant literature has tried to analyse the contribution of migrant's income on individual and household expenditure behaviour in order to assess whether receiving remittances leads to different decisions in the allocation of the household budget share (Zarate-Hoyos, 2004; Adams, 2007; Castaldo and Reilly, 2007; Adams *et al.*, 2008a and 2008b; Ang *et al.*, 2009, Adams and Cuecuecha, 2010a and 2010b; Clément, 2011 etc.). The

interest in consumption behaviour is not explained only by considerations about poverty; it can have important implications on the growth and development of local economies when it is orientated to productive goods and activities. Therefore, the question on how remittances are spent becomes relevant. The debate on the use of remittances is not limited to the fact that migrant's transfers are just an additional source of earnings which contribute to the total household income, but remittances may include some extra information which gives them an additional value. For example, through remittances migrants share ideas, skills, business practices, models of lifestyle and wealth adopted in the destination country. These imported knowledge may enhance investments in human capital through education and more health-conscious attitudes.

Overall, the role of remittances on household behaviour with respect to expenditure depends on how remittances are perceived by the recipient households. Three different views animate the discussion on the use of remittances and their supporting empirical evidences leave the debate open. The most recent view concludes for a productive use of remittances: remittances are perceived by the recipient households as transitory income and they are spent more on investment goods – human and physical capital investments – instead of consumption goods. Empirical studies showing that remittances contribute on child education (Cox-Edward and Ureta, 2003; Kifle, 2007; Yang, 2008; Adams and Cuecuecha, 2010a; Mansour *et al.*, 2011), housing (Adams and Cuecuecha, 2010a) health (Taylor and Mora 2006) and/or investments (Woodruff and Zenteno, 2004; Taylor and Mora, 2006) affirm that remittances have a positive impact on economic development by increasing the level of investment in human and physical capital. The opposite view argues that remittances cause behavioural changes and are spent on consumption rather than investment goods (Chami *et al.*, 2005; Adams and Cuecuecha, 2010b; Clément, 2011). This is quite a pessimistic view on the use of remittances, which may also lead to household dependency on migrant's income with negative effect on the economic development.[5] The last view on remittances does not support any expenditure behaviour change caused by migrant's transfers: remittances are fungible and they are treated just as any other

[5] However, Catrinescu *et al.* (2009) argued that contradictory findings have emerged when looking at the remittances-growth link because of an omitted variable bias: specifically, remittances will be more likely to contribute to longer-term growth in countries with higher quality political and economic policies and institutions

source of income; there is no difference in behaviour between those who receive and those who do not receive remittances (Zarate-Hoyos, 2004; Castaldo and Reilly, 2007; Adams *et al* 2008a; Ang *et al.,* 2009).

The question on whether or not remittances are used productively is quite a complex issue; given the fungible nature of money, it is not easy to separate remittances from other sources of income. Moreover, survey data does not often provide information on the use of remittances but rather on how households allocate their total income. The analysis, therefore, on how remittances are spent by the recipient households is conducted empirically in trying to assess whether receiving remittances rather than the amount of remittance received is significant in determining the consumption of a range of goods or one in particular. The Engel curve framework is traditionally used to model consumer behaviour and it is the most common approach to analyse the impact of migrant's remittances on household expenditure behaviour in developing countries. Remittances - often in the form of binary indicator - are added as extra explanatory variable in the household budget shares. While some studies focus on the effect of remittances on a specific household expenditure, others consider a wide range of consumption and investment goods and they control for different sources of remittances – domestic and international – and they find that the origin of remittances contribute to explain their use (Taylor and Mora, 2006; Castaldo and Reilly, 2007; Adams *et al.*, 2008a; Adams and Cuecuecha 2010a; Clément 2011).

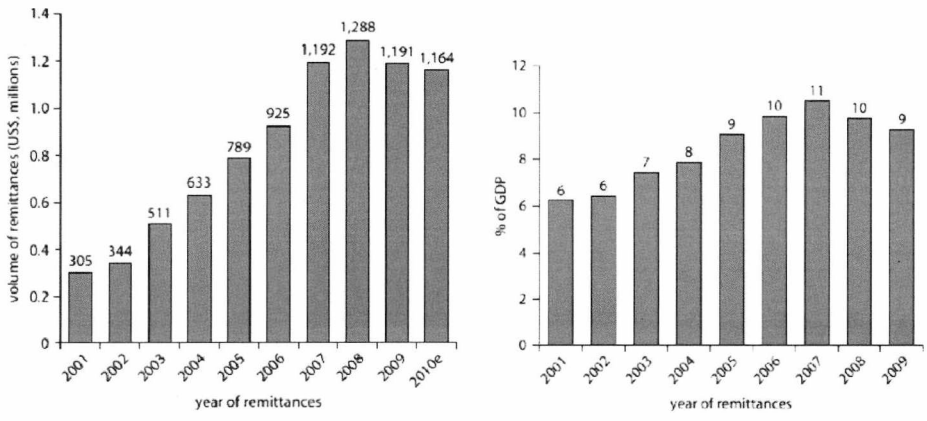
Chapter 2 reviews some of the most recent empirical studies on the impact of remittances on household expenditure behaviour and aims to contribute to the debate on the use of remittances in developing countries. In fact, it seems that the way migrant's transfers are perceived by the recipient households depends also on the socio-economic context in which remittances are received and policy makers can be proactive in stimulating their productive use.

The analysis on the role of remittances on household expenditure behaviour is conducted using data from a recent Migration and Remittance Household Survey in Senegal. This survey is part of the African Migration Project (AMP) piloted in Sub-Saharan Africa by the African Development Bank and the World Bank between 2009 and 2010. The aim of the project is to provide a better understanding of migration and remittances in Sub-Saharan Africa where, despite the importance of these phenomena,

data are inadequate when available. Around 70 household surveys conducted between 1990 and 2006, available at the World Bank, were reviewed and their limitations were the reason to conduct the project and improve the quality of information.

The survey used in Chapter 2 of this thesis contains detailed information on different types of household expenditure from consumed goods to physical and capital investments. It therefore provides a general view on the household use of remittances. Moreover, the research question of how remittances are spent is quite relevant in Senegal. Senegal experiences a large flow of internal and external migration. A combination of climate and historical factors has been the main cause of human movements and consequently the flow of remittances to Senegal has increased consistently. Figure 1.2 shows the volume of remittances and their percentage as share of GDP between 2001 and 2009. The World Bank bases its calculation only on migrant's transfers arriving through official channels; the estimates could be potentially much higher if remittances from unofficial channels were also included. According to the World Bank estimates, Senegal is fourth among the recipient countries in Sub-Saharan Africa (after Nigeria, Sudan and Kenya) and fifth when remittances are considered as share of GDP (after Lesotho, Togo, Cape Verde and Guinea-Bissau).

Figure 1.3- Volume and share of GDP of migrant's remittances



Sources: World Bank 2010, 2011.
Note: e = estimated. Figures do not include remittance flows through informal channels.

Therefore, Senegal lends itself to be an interesting case study for understanding which role remittances play in the determination of household expenditure behaviour. The survey allows us to identify four types of recipient households: those who receive no remittances; those who receive domestic remittances; those who receive international remittances; and those who receive both domestic and international remittances. The analysis is conducted with 1,956 households and we investigate the behaviour of four types of recipient households on seven different categories of expenditures. Then, because remittances is a potential endogenous variable, the empirical analysis follows Clément (2011) who applies the propensity score matching technique for studying the impact of remittances on household expenditure behaviour. In the absence of a valid instrumental variable, propensity score matching is an alternative approach to reduce the potential bias caused by endogeneity. Several matching methods are used and their results lead to the conclusion that international remittances affect positively investments on human and physical capitals. However, a drawback of this approach is that it only evaluates the impact of remittances at the average level of each budget share and it does not show how recipient households allocate their budget shares at the margin.

In order to have a more complete view on the impact of remittances on household consumption decisions the analysis embraces the Engel curve framework. We apply the popular Working (1943) Leser (1963) model using the Ordinary Least Squares to estimate the budget shares; then marginal budget shares and elasticities are computed for each type of good. The decision to perform the analysis using OLS finds its justification in the fact that similar insights of the impact of remittances on household budget shares are found comparing OLS outcomes with those from the propensity score matching techniques. The Working-Leser model results show that at the margin recipient households do not exhibit a different behaviour in how they allocate expenditure compared to those who do not receive remittances.

The empirical analysis supports the view that remittances are just another source of income and households do not distinguish among the sources of income: money is fungible. Even if we are not able to address the issue of endogeneity the close estimates among different matching and OLS methods make us quite confident of the results obtained. Moreover, given that households do not differentiate with respect to wherever income is generated we conclude that endogeneity is not an issue in this specific study.

Conversely, endogeneity is a more serious issue when remittances cause a behavioural change in the way households allocate their expenditure. The evidence that, at the margin, remittances are spent just as any other source of income suggests that remittances by themselves cannot promote development; but it does not mean they cannot play an important role in the development process. Remittances need to be supported by development strategies and by political-social context which promote physical and capital investments.

1.4.2 Remittances and effects on individual occupational choice

While Chapter 2 presents an analysis of the effect of remittances on development through the household consumption decisions, Chapter 3 focuses on the role of remittances on development through the occupational choice decision of those left behind. On the one hand, migration implies the loss of a member contributing to the household income and the occupational choice of those left behind might be affected by the need to fulfil that production gap; at the same time, in countries with high level of unemployment and lack of job opportunities emigration may decrease the competition and pressure in the labour market and leave more job opportunities to those left behind. On the other hand, those receiving remittances from the member abroad may choose to substitute leisure with labour and decrease their participation in the labour market; or they decide to incur in more or less risky activities using remittances to finance new businesses. Availability of capital is an essential ingredient to start a business and in general to promote employment opportunities. Paulson and Townsend (2004) provide evidences that the lack of necessary funds is the reason why many households do not start a business or are not able to expand it if they are already entrepreneurial households. In the context of Thailand, they show that wealthier households are more likely to start a business and they are able to invest more in their business because they face fewer constraints compared to less wealthier households, especially in the presence of weak credit market. The decision to start a small business has an important role in promoting development; in fact, entrepreneurial activities are an important source of innovation, jobs and economic growth.

Credit market imperfections are a common problem in poor economies (Mesnard, 2004) and liquidity constraints weigh significantly on the choice of being an

entrepreneur. Existing empirical evidence shows that migrant's remittances alleviate credit constraints and help create access to self-employment activities (Adams, 1998; Woodruff and Zenteno, 2007; Yang, 2008).

In addition to migrants' transfers, the type of migration plays an important role in promoting employment opportunities where credit market imperfections are a serious issue. One of the aspects of this area of analysis is the role of return migration. Under financial constraints, temporary migration decision is the strategy to accumulate savings overseas and engage in self-employment activities upon return (Mesnard, 2004; Ilahi, 2002; Dustmann and Kirchkamp, 2002). Moreover, using the counterfactual analysis, it has been shown that return migrants are more likely to engage in entrepreneurial activities compared to non-migrants (Demurger and Xu, 2011; Piracha and Vadean, 2010).

However, none of these studies look at the effect of remittances on the occupational choice of those left behind. Even if the contribution of return migrants on the development of their origin countries may be quite consistent – as they accumulate human and financial capitals during the migration experience - the impact of remittances on the dynamics of the local labour market cannot only be studied through them. The inflow of income generated abroad is likely to have an impact on those who do not experience migration. On the one hand, the access to an additional source of capital can be a way to finance a new project and start an independent activity while on the other hand, remittance receiving household members could substitute work with leisure and use remittances just as a source of income.

A number of papers have shown that remittance receiving households have a lower tendency to participate in the labour market or tend to reduce the number of hours worked, concluding that remittances generate a dependency effect (Justino and Shemyakina, 2010; Acosta, 2006; Kim, 2007; Funkhouser, 2006). Another interesting angle, in addition to how migrant's income impacts individual decision on whether to participate and/or how much to participate, is the occupational choice of those left behind. This particular aspect has hardly been explored in the existing literature. Acosta (2007), one of the very few exceptions, presents a comprehensive study which examines the effect of international transfers on labour participation, hours worked and occupational choice of those left behind in the context of El Salvador. Acosta shows

some evidences that remittances increase the probability of self-employment for those left behind and suggests that international transfers can be used to promote new activities overcoming liquidity constraints in less developed countries.

A more recent study by Giulietti *et al.* (2013) explores the effect of internal migration on entrepreneurship decision of individuals left behind in the case of rural China. They find that those with no migration experience are more likely to be self-employed if there is a return migrant in the household but less likely if they have a current migrant in the household compared to individuals living in households where no one has migrated. They do not conclude for a positive effect of migration and remittances on those left behind: remittances are not enough to compensate the absence of a member. However, if return migration occurs then household members could benefit from the experience gained from the returnees to set-up a business. Giulietti *et al.* (2013) consider only the impact of internal migration in rural areas. International migration and migrant's income generated abroad may tell a different story on the occupational behaviour of those left behind; moreover, limiting the analysis only at rural areas does not provide a full picture as urban areas may be endowed with better services and infrastructures compared to rural locations and a new activity – different from agriculture – may be easier developed there.

The research, presented in Chapter 3, investigates the effects of remittances on the remaining household members through their decisions in the local labour market. The analysis is conducted using data from Tajikistan – Tajikistan Living Standards Survey (TLSS) 2007 – and it considers four possible occupational choices of those left behind: not working; working on household farm; working in a household business; wage employment. The not working category includes those who at the time of the survey were unemployed, waiting for a recall, waiting for a busy season or not looking for a job because they were discouraged having not found it. Those working in agriculture activities are considered separate from those running any other types of business because the two self-employment choices respond to different strategies and risk-aversion. Moreover, this distinction is quite relevant in a country like Tajikistan where agriculture is the largest sector of the economy and the major source of employment (see European Training Foundation, 2010). Finally, the wage employment category includes all those working in any salaried or paid job under another person or

enterprise. The analysis only focuses on the working population (15 to 62 for men and 15 to 57 for women); students, housewives and retired are excluded from the empirical investigation.

Tajikistan is an interesting case study as it is one of the poorest countries in the world and the long civil war (1992-1997) affected consistently the process of growth and development. Economic difficulties limit employment opportunities and reduce the labour participation rate at 51.7 per cent (see European Training Foundation, 2010). Furthermore, the lack of capital results in the inability to invest in productive farm and non-farm activities (Vandenberg, 2006), which could generate jobs, income and reduce poverty. For many households the migration of a member is the way to deal with poverty and lack of jobs in the home country: "*Although not captured in official census statistics, Tajikistan may be the largest emigrant labour supplier in the world. The best estimates indicate that approximately 600,000 Tajiks, or 18 per cent of the adult population, leave the country every year to seek seasonal work or to work abroad for a couple of years*" (Erlich, 2006). For many migrants the income generated abroad is the way to provide for the basic needs of their family members in Tajikistan. Figure 1.1 (p. 13) shows Tajikistan as top recipient of migrant's remittances as a share of GDP. The World Bank computations are in line with Riester (2012) who reports that remittances to constituted 49.6 per cent of the country's GDP in 2008.

Besides providing a source of income for covering daily needs, remittances could be directed in supporting household economic activities. That would lead to a productive use of migrant's income: the development or expansion of agriculture or micro-enterprises activities would generate job opportunities and additional income to achieve higher living standard.

The empirical strategies used for investigating whether remittances affect the occupational choice of those left behind model remittances: (I) as a binary variable, those living in remittance receiving households and those who do not; (II) as a continuous variable, considering the amount of migrant's transfers each household receives. One of the ways to deal with the endogenous remittance variable is to apply the biprobit framework where remittances are treated as a dummy variable and the control function approach when remittances are a continuous variable. Both strategies

need the identification of at least an instrument which has to be correlated with remittances but not with the individual occupational choice.

The analysis on the impact of remittances on individual occupational choice is conducted separately for the sample of men and women. Tajikistan is a traditional country and its population is 98% Muslim: gender differences exist in the way the society is constructed, which may impact individual choices. In fact, the analysis reveals that remittances impact the occupational choices of men only; there is no impact on women's occupational choice – this may be explained with the low participation of women in the labour market. The results obtained on the men's occupational choices let us conclude that remittances have an important contribution in generating employment opportunities for those remaining in the origin country: the amount of remittances received increases the probability to be employed in a household business and decreases the probability of working as wage employees. And these results are consistent when the remittance variable is replaced with the number of migrants in the household.

A decomposition analysis is implemented to investigate the differences in gender occupational outcomes. It shows that the different impact of remittances on the outcome variable are not due to differences in gender characteristics but to belonging to a specific gender group and therefore determined by culture and tradition.

1.4.3 Remittance behaviour in the case of return migrants: the empirical investigation

Based on the theoretical and empirical literature, Chapter 4 investigates the remittances behaviour in the case of return migrants. Even if the share of migrants returning to their countries of origin is quite low for the developing countries, their contribution to the development of their region can be quite significant. They acquire and transfer two resources: human capital (i.e. education, working experience or business skills acquired abroad) and financial capital (i.e. repatriated savings or remittances). Moreover, several studies focusing on return migration find that a consistent proportion of returnees start a business or work as self-employed after return (Mesnard, 2004; Piracha and Vadean, 2010) and most probably the income generated abroad is used to overcome financial constraints and set-up new activities.

The research uses individual and household characteristics of the return migrants to study what determines the decision and the amount of remittances. The approach

chosen separates the probability from the level of remittances. Therefore, the relevance and sign of the variables are discussed separately for the two decisions.

The empirical analysis uses a cross-sectional data set collected in 2006 in the context of the *Migration de Retour au Maghreb* (MIREM) project. This unique survey provides a rich source of information for the three Maghreb countries: Algeria, Morocco and Tunisia. They have a long history of out migration and consistent remittance flow, and the limited research on this region within the migration literature is the reason for using this data set. In particular, this dataset has never be used to investigate on remittance motivations and our it is the first empirical study which uses it for this purpose.

In general, poverty, unemployment problems, financial constraints and the slow democratization process, affected by several political instabilities, have been the main reasons to emigrate from the region. Unskilled and semi-skilled workers with rural origin have dominated the migration flow to Europe with France as main destination. However, over the last few decades the unemployment problems have also affected the most educated individuals who are increasing their share as migrants.

North African population movements have produced a consistent flow of transfers to the origin countries. In 2007 - approximately the time the MIREM survey was implemented - the entire North Africa region received a flow of official remittances of $18 billion and in particular, in Morocco migrant's remittances account for 9 per cent of its GDP. Even if in Algeria and Tunisia remittances constitute a small part of their GDP, they are still significant and exceed ODA and FDI (Table 1.1).

Table 1.1 – Flow of remittances in 2007

	Remittances	
Country/Region	**($ U.S. billions)**	**% GDP**
North Africa	18.2	4.8
Algeria	2.1	1.6
Egypt	7.7	5.9
Morocco	6.7	9
Tunisia	1.7	4.9
East Asia Pacific	65.3	1.5
Europe Central Asia	50.4	1.6
Latin America Caribbean	63.1	1.7
Middle East North Africa	31.7	3.7
High Income OECD	85.7	0.2
South Asia	52.1	3.6
Sub-Saharan Africa	18.6	2.2

Source: World Development Indicators, 2009

The main objective of the MIREM project was to provide a better picture of return migration and its impact on development. In fact, the information provided by official statistical data are limited and remain too fragmentary to understand the challenge connected with return migration. Return is a stage of the migration process which can be fully understood only after a careful analysis of the whole migration experience, considering also pre and post migration conditions. The MIREM team aimed to contribute and fill this knowledge gap on return migration. Therefore, the survey considered migrants' conditions prior to migration, migration flows and various aspects of the migration experience (employment status, education and training received, legal or illegal status etc.) together with the post return conditions.

The empirical framework explicitly separates the decision from the level of remittances and uses a two-stage model to analyse the mechanism behind the two outcomes. The empirical findings support the decision to consider probability and level of remittances as generated by two different mechanisms: some variables are significant in explaining only the decision to remit whereas others affect only the level of migrant's transfers and a detailed discussion is provided in Chapter 4. Moreover, a novel feature of the study is that it considers whether the remittance behaviour is dependent on the type of return: "decided" versus "compelled". Varying degrees of willingness to return can help to understand the probability and level of remittances as well as the potential contribution of return migrants to their origin countries. This aspect has not been

considered by the previous literature and the willingness to return home is essential in the process of reintegration and for a productive use of the human and financial capital accumulated during the migration experience. To our knowledge this is the first work which focuses on the type of return to understand differences in remittance behaviour.

CHAPTER II

REMITTANCES AND HOUSEHOLD EXPENDITURE BEHAVIOUR IN SENEGAL

2.1 Introduction

Remittances are one of the key factors in understanding the effect of migration on the countries of origin. There is a growing interest on how remittances are spent and whether their use impacts the economic development (Adams and Cuecuecha, 2010a; 2010b). The role that remittances can play, at the household level and the consequent effects on the local community, depend on how remittances are perceived by the household. The literature presents three views on how remittances are perceived by the recipient households. The first view, which is part of the permanent income hypothesis, is that remittances are transitory income and therefore are spent, at the margin, in more 'productive' activities like human and physical capitals. If this is the case then remittances should have a long term impact on growth and development of the receiving country. The second view is that remittances are compensatory income and therefore spent more on consumption rather than investment goods. While this could result in generating domestic production perhaps, it can also lead to an indirect effect on inflation in a number of developing countries (Narayan *et al.*, 2011). The final view regards remittances as just any other source of income and therefore no difference in the expenditure behaviour emerges from the households' remittance status.

The main objective of this paper is to contribute and extend the debate on how remittances are spent or used by the recipient households. One region where evidence is lacking is Africa; in fact, only recently projects on data collection have been implemented in several African countries. We conduct the analysis using migration and remittance data from Senegal, a country that is one of the leading out-migration (both internal and international) regions in sub-Saharan Africa. The survey data, collected in

2009, was part of the African Migration Project, led by the World Bank. The data allows us to differentiate four types of households: those who receive no remittances; remittance recipients from internal migration;[6] remittance recipients from external migration;[7] and finally households who receive remittances from both internal and external migrants. We consider recipient households according to the origin of remittances because we want to capture whether the source of transfers affects the household perception of remittances and therefore the way they use them. Several empirical studies find that domestic and international remittances affect differently equity and expenditure of consumed and investment goods. For instance, Adams (1996) finds that internal remittances have an equalizing impact on income distribution while external remittances have the opposite effect (see also Clément, 2011; Adams and Cuecuecha, 2010b; Adams *et al.*, 2008b; Castaldo and Reilly, 2007).

We assume that each household has to allocate its expenditure on several commodities and we want to understand whether receiving remittances have any impact on the household decision. We are able to identify seven types of goods: food, consumed and durable goods, housing and land, investment, education, other type of items such as expenditure on funerals, engagements and weddings. The analysis is conducted using different approaches and empirical methodologies to ensure robustness of the results.

Our main objective is to determine how remittances impact expenditure behaviour at the margin. In order to assess that, we consider the popular Working-Leser model which relates budget shares linearly to the logarithm of total household expenditure. For the Working-Leser model we need to carry out the estimates using Ordinary Least Squares (OLS). However, given that recipient households are not randomly selected, characteristics associated with a particular household rather than their status of being a remittance recipient can potentially have an impact on their expenditure behaviour, which means OLS results could be biased. As we could not find a suitable instrument in the data to correct the bias, we first apply propensity score matching analysis to evaluate the impact of receiving a "treatment" – represented by the different sources of remittances – on household expenditure behaviour. Mckenzie *et al.*

[6] Internal migration is a synonymous of domestic migration (within the country)
[7] External migration is a synonymous of international migration

(2010) show that when it is not possible to identify a good instrumental variable propensity score matching performs comparatively well. Five matching methods are compared in order to assess the impact of remittances on expenditure choice. Our results show that internal transfers do not have a strong impact on household expenditure decision whereas external remittances affect significantly the expenditure on food – which decreases for recipient households – and the expenditure on durables, investment and education – positively affected by the receipt of external transfers. It therefore seems that external remittances result in investment in productive elements like human capital and not on consumption.

Propensity score matching, however, only helps us evaluate the impact of remittances at the average level of each budget share, but the results provide us with a benchmark against which it is possible to evaluate the OLS estimates. We estimate the budget share equations using Ordinary Least Squares and compute marginal budget shares and elasticities for different types of goods. Similar insights of the impact of remittances on household budget shares are found comparing the OLS outcomes with the propensity score matching estimates. This suggests that OLS results are reliable. We then explore household consumption decision looking at marginal behaviour and demand elasticities. We find some differences in how households allocate their expenditure however, we cannot consider them statistically significant. Moreover, the different types of recipient households perceive expenditure in similar ways i.e. in terms of necessity, normal or luxury goods.

The rest of the paper is structured as follows. Section 2.2 contains a brief outlook on Senegal and its emergence as an important emigration country; section 2.3 presents the relevant literature on the relation between remittances and household consumption patterns; section 2.4 describes the dataset used in this study; section 2.5 presents the propensity score matching techniques and the Working-Leser model; section 2.6 discusses and compares the empirical findings; and section 2.7 concludes.

2.2 Senegal: a brief background

Sub-Saharan Africa (SSA) is becoming an important emigration region. In the recent years the rate of migration from the SSA has evolved dramatically: between 2000 and 2005 the outward migration increased by 275 % (Naudé, 2010). The recent highest

growth rate in net migration is due to the interplay of different factors: political and economic instability, violent conflicts, climate change and deterioration of the environment which include desertification and rainfall related problems.

In comparison to the neighbouring states, Senegal is a country that experiences a good level of freedom and democracy both in political institutions and society, though an exception to the overall stability is represented by the Casamance conflict in the South of the country, during the 1980s. The conflict led to intense refugee outflows due to human right abuses. Also, Senegal has experienced a number of social, economic and political crises: the devaluation of the Franc CFA in 1994 and the high level of unemployment in the same period are expressions of the difficulties faced by the country.[8] Moreover, at the beginning of 2000s poverty affected almost half of the population (Cisse, 2011).

Several rainfall shocks have occurred in the whole sahelian region in the past 50 years. The drought in the 1970s and 1980s had strong consequences for the economy and forced the population of the most affected areas to move within and outside the country. Even though there was a slight improvement in rainfall during the 1990s, a severe rainfall deficit occurred again in 2002 (Sarr, 2007) and the prospects for the future do not seem encouraging.

Senegal experiences both internal and external migration. Internal movements, especially from rural to urban regions, are the predominant form of migration. Shortage of food in the rural areas, adverse climate conditions and the search of economic and employment opportunities explain internal migration which involves around 13 per cent of the Senegalese population with Dakar, Thies and Diourbel as the primary regions of destination (ANSD: RGPH-III, 2002). In terms of external migration, approximately 5 per cent of the population resides outside Senegal. West African Countries are the principal destinations, attracting 53.4 per cent of Senegalese migrants. In Europe, France is the first preferred destination followed by Italy, Spain and Germany. But also the USA is becoming an important international destination.

As a consequence of the migration trends within and outside the country, the volume of workers' remittances to Senegal has increased considerably in the last

[8] 50 per cent devaluation of the CFA franc against the French franc.

decade. The real size of those transfers is unknown because of the different informal channels used to send them to the family left behind. [9] The available official figures show that remittances quadrupled in less than a decade: from $305 million to $1,288 million between 2001 and 2008. The global financial crisis in 2009 slightly affected those monetary flows resulting in a decline of 8 percentage points. Nevertheless, migrants' transfers accounted for 9 per cent of GDP in 2009 compared to 6 per cent in 2001. A survey conducted in 2007 by the African Development Bank, which covers both formal and informal transfers, estimates that remittances to Senegal accounted for 19 per cent of the GDP in 2009. The larger proportion of transfers are generated in the European Union (52 per cent) mostly from Italy, Spain and France (Cisse, 2011)

Regular remittances are a new phenomenon and more and more households, especially in the rural areas, depend on those transfers to satisfy various daily needs. The second Senegalese Household Survey (ANSD: ESAM II, 2004) shows that the funds received from abroad have increased the average per capita expenditure of recipient households by almost 60 per cent compared to those households who do not receive remittances. It seems that the larger proportion of remittances goes to current consumption (Cisse, 2011; Some, 2009); and at the national level those transfers have reduced poverty by almost one-third (ANSD: ESAM II, 2004).

2.3 Literature review

The household is the first unit which takes decision on the use of remittances and therefore, in essence, it determines the role remittances play in the development process of the receiving country. Remittances are received under imperfect information, uncertainty and with different regularity (Seshan, 2012; Chami *et al.*, 2005) therefore how they are perceived by the households is not straightforward. Based on the previous empirical studies, the impact of remittances on household expenditure decision has been interpreted mainly according to three different views, discussed in Introduction above, which show that it is how the household perceives transfers to make their use more or less productive. Recent studies interpret remittances as a transitory income and conclude

[9] Sending them through post, intermediaries or migrants carrying cash themselves.

for a positive effect of remittances on different types of investment goods: productive activities, housing, education and health.

For example, Cox-Edwards and Ureta (2003) analyse how different types of income – remittances and income from other sources – affect the household decision on children's schooling level in El Salvador. They use a 1997 household survey of 14,286 individuals between the ages of 6 and 24 and conclude that the source of income does matter in the household decision for the investment in schooling: remittances have a larger positive effect on school retention both in urban and rural areas, even if the impact is stronger in the urban places. A positive impact of remittances on child education is also supported by Kifle (2007) in the case of Eritrea. He used 125 remittance receiving households with young members between 7 and 20 years old and found that recipient households spend a significant proportion of remittances on child education. Also, Mansour *et al.*, (2011) find that remittances lead to positive outcomes on education; in the context of Jordan, they show that remittance receipt increases school attendance for males aged 18-24 and positive effects on education attainment are found both for men and women in the same age range. They conclude for positive contributions of remittances on human capital accumulation of relatively young people.

In the Philippines, Yang (2008) examines how household expenditure behaviour responds to a favourable exchange rate shock when international remittances are received. In particular, the paper looks at the expenditure patterns of 1646 households before and after the 1997 Asian financial crisis. The positive income shock, caused by the appreciation of the migrant's currency against the Philippine peso, raises the expenditure on education. Moreover, child schooling increases while child labour falls. Receiving more remittance income is associated with a positive effect on the ownership of various types of durable goods, hours worked in self-employment and investment in the capital-intensive enterprises like: transportation, communication and manufacturing. Most likely the exchange rate shock relaxed the credit constraints faced by the households providing them with the necessary resources to start new business activities. The access to international remittances helps overcome credit constraints in Woodruff and Zenteno's (2004) paper also. They find that remittances are responsible for more than 25 per cent of all capital invested in small micro-enterprises in rural Mexico. That percentage increases to 40 per cent within those regions with higher level of migration.

In a study based in 14 states in Mexico, Taylor and Mora (2006) control for different migrant destinations and therefore for potentially different sources of remittances. The main focus of their work is to look at the household marginal spending behaviour among three different types of households: those without migrants, those with internal migrants and finally the households with international migrants. They find differences in the expenditure behaviour among the three types of households. In particular, compared to non-migrant households, those with international migrants show a considerably large marginal spending for investment while those with internal migrants spend more on services, health and housing. Their findings support the view of a productive use of remittances. The same conclusion is reached by Adams and Cuecuecha (2010a) who also take into account different sources of remittances. Using a nationally-representative household survey in Guatemala, they find that at the margin both households receiving internal and external remittances spend more on human capital and investment goods - like education and housing - and less on food.

A more pessimistic view on how remittances are spent at the household level argues that transfers are used more on consumption rather than investment goods and they do not have any positive effect on development. This conclusion is strongly supported by Chami *et al.* (2005) who define remittances as compensatory transfers for poor economic performance.[10] They construct a dataset including 113 countries for (which the information on remittances can range) over the period 1970-1998. Their empirical analysis reveals that remittances are negatively correlated with GDP growth and therefore those flows of money do not appear to be a source for economic development but rather may cause some behavioural changes at the household level: recipients reduce their labour supply and labour market participation. In another paper, Adams and Cuecuecha (2010b) find that in Indonesia remittances affect positively the marginal expenditure of one key consumption good – food – while the marginal expenditure on housing, considered an investment good, gets reduced. This finding contradicts what the same authors find in the similar study on Guatemala. They justify it with the different amount of transfers that the households in the two countries receive:

[10] However, their empirical approach was challenged by Catrinescu *et al.* (2009) who, using the same data as Chami *et al.* (2005), showed that omitted variable bias was partially responsible for the their results. In particular, controlling for political institutions in the receiving country, Catrinescu *et al.* showed a positive effect of remittances on investment and therefore on GDP growth.

the level of remittances received by the Guatemalan households is higher than those in Indonesia and the recipient in the latter case are much poorer. Therefore, while in Guatemala households are able to devote more of their marginal expenditure to investment goods, in Indonesia remittances are used to improve consumption in basic goods. Finally, Clément (2011) supports the idea that remittances are not used in a productive way. He shows that in Tajikistan international remittances significantly increase the household consumption level but have a negative impact on investment expenditures. However, the effect of domestic remittances is not clear; as they affect two investment goods in opposite directions: domestic transfers reduce expenditure on housing and agriculture but increase spending on health. No effect of remittances is found on other key investment variables such as education. He justifies this finding with the fact that health outcome is a short-term priority while education and agriculture represent long-term investments. He concludes that domestic remittances help households to achieve a basic level of consumption.

Another way to look at remittances is to consider them fungible and therefore just as any other source of income. If a euro of income of remittances is treated by the household as a euro of wage income then migrant's transfers do not produce any change in how the household allocate its expenditure. Many empirical studies do not find a strong impact of remittances on household expenditure behaviour and they conclude that income is just income wherever it is generated. For example, Zarate-Hoyos (2004), using data from the Mexican income and expenditure survey for 1989, offers empirical evidence for which the consumption pattern of households receiving and non-receiving remittances do not differ substantially. He considers different expenditure categories and finds that, on average, remittance receiving households spend less in most of the categories, implying that they may prefer the saving option. In his analysis of urban and rural areas, the remittance variable is statistical significant only in the former case. He interprets those results with the lack of suitable commercial opportunities - to allow the use of resources in a productive way in the rural areas. More recently, Cattaneo (2012) shows that remittances do not influence spending on education in Albania.

The view of insignificant impact of remittances on household expenditure is also supported by Castaldo and Reilly (2007). Using Albanian data and controlling for four categories of expenditure: food, non-food, durables and utilities, they find no significant

effect of domestic remittances on household expenditure while, compared to non-receivers, international transfers for the recipient households impact positively the share of expenditure devoted to durables and utilities and negatively on food. However, even international remittances do not seem to play a substantial role when the focus is the marginal spending behaviour. Adams *et al.* (2008a) arrive at the same conclusion in their comparative study on household marginal spending behaviour in Ghana. Using the 2005/2006 Ghana Living Standards Survey, they investigate on a wide range of consumption and investment goods to capture any significant effect of remittances on household expenditure decision but it seems that remittance income is treated just like any other source of income. Ang *et al.* (2009) present similar results for the Philippines households. Using data from 2000, 2003 and 2006 Family Income and Expenditure Survey, they analyse the role of remittances in the household consumption and investment decisions. Except for the food share equation, they do not find any significant role played by migrant's transfers on other consumption and investment commodities. Finally, mixed evidence of the effect of remittances on household expenditure is provided by Tabuga (2007). Again, using data from the Philippines, he shows that remittances are used for consumption purposes but they are also invested on education and housing.

A possible explanation for the existence of that wide range of empirical findings could be the difference in countries income level and perhaps in investment opportunities. It seems reasonable to think that remittances in middle-income countries are treated differently than in countries with a very low income level. In the latter case transfers are perhaps used as any other source of income without any behavioural change in the way in which households decide to allocate their expenditure.

2.4 Data

We investigate household expenditure behaviour using data from a recent Migration and Remittance Household Survey in Senegal. This survey is part of the African Migration Project (AMP) conducted in Sub-Saharan Africa by the African Development Bank and the World Bank during 2009 and 2010. The Africa Migration Survey defines migrant as "a person who used to live in a household in the country in which the interview is being conducted but left before the interview to live abroad, or in

another village or urban area within the country, for at least six months." Remittances "include both international (cross-border) and national (within-country) person to person transfers of resources (both monetary and in-kind) often sent by migrant workers".

The questionnaire is structured in eight sections that together try to give a general view on characteristics of household members, household conditions and expenditures, migration motivations, migrant characteristics, remittances motives and information on return migrants.[11] The survey is representative at the national level and 2,100 households were interviewed. We divide the sample into those who receive no remittances, remittance recipients from internal migration, remittance recipients from external migration and finally households who receive remittances from both internal and international migrants. The data file contains 1,953 households of which 713 are without any migrants, 523 have internal migrants only, 561 have external migrants and 156 have both categories of migrants. Table 2.1 shows that, on average, the households with no migrants have the youngest household head and also a smaller household size compared to the migrant households. Looking at the level of education, households with external migrants have a higher percentage of members with secondary and tertiary education compared to households with internal migrants. Non-migrant households have the highest proportion of members with tertiary education.

[11] A return migrant is defined a person over 18 years old currently living in the household who had lived in another country or place for at least three months in the 5 years preceding the survey.

Table 2.1 – Some data description: households with and without migrants

Household characteristics	HH with no migrants	HH with Internal migrants	HH with External* migrants	HH with both Internal&External migrant
Age (head of the household)	51	53	53.7	59.7
HH size	7.8	9	10	12.5
Education (members)**				
None	54.04	58.35	52.45	65.96
Primary	20.12	19.45	18.88	16.36
Secondary	17.86	17.60	22.31	14.94
Tertiary	7.91	4.61	6.36	2.74

*** external migrants is a synonymous of international migrants**

**** percentage of members older than 17 with the corresponding level of education**

As the focus of this study is on the impact of remittances on household expenditure behaviour, we classify households as receivers or non-receivers of remittances. Due to missing information in some of the considered expenditure categories we restrict the analysis to 1,939 households. This means that those households who have migrants but who do not receive remittances either from family or non-family members[12] are recorded in the not receiving category together with the households with no migrants. Those households who do not have migrants but receive transfers from non-household members are put in the one of the remittance-receiving category, depending on where the remittances are generated.[13] Finally, we end up with 948 households who do not receive remittances and 991 who receive transfers. Out of 991 in the latter category, 327 households receive transfers from within Senegal while 482 households receive external; remittances; 182 households receive flows of money

[12] The survey defines family members those who live in the same household unit: non-family members are relatives and friends who do not live in the same household.

[13] For example, 49 households with no migrants among family members receive remittances from non-family members; 168 household with internal migrants do not receive remittances from their members (6 of them receive internal remittances from non-family members); 108 households with external migrants do not receive remittances from their members (4 of them receive remittances from non-family members); 17 households with both internal and external migrants do not receive remittances from their members; moreover, there are 9 households with external migrants who receive remittances internally and externally and 32 household with internal migrants who receive mixed remittances as well and therefore these households are redefined in the group of those receiving both internal and external transfers.

both from internal and external destinations. Those receiving from both sources are considered in a separate category because we are not able to conclude which flow of money is predominant and the mixed effect does not allow us to interpret the household expenditure behaviour with respect to the place where remittances are generated. Moreover, we can interpret receiving remittances from multiple destinations as a family strategy to spread the risk between the home and the host countries.

We do not have any information on earnings therefore we are not able to attest in what percentage remittances contribute to household income. But in line with most demand studies we consider total expenditure instead of income (see Adams and Cuecuecha, 2010b; Adams *et al.*, 2008a). Also, household income can be measured with error and information on expenditure seems more reliable. Individuals may be adverse to say exactly how much they earn and moreover it is more volatile and affected by certain life events while spending is maintained at a more constant level over time. Therefore it may be that spending is a better representation of an individual's average income.

The survey collected detailed information on different types of household expenditure. We aggregate them considering the following categories: expenditure on food, consumed and durable goods, housing and land, investment, education, health and other goods. The information on household expenditure is collected with attention to the different frequency of consumption. The survey provides weekly expenditure for some items (e.g. food); monthly for others (e.g. durable goods); for expenditure such as investments the information provided refers to the last six months. As the objective of this work is to understand the impact of remittances on household expenditure decision and the question on the amount of remittances received refers to the last year, we aggregate each type of expenditure to obtain annual values. Table 2.2 presents a description of what each category of expenditure contains; it also shows the overall average budget share of each group of commodities. Table 2.3 shows how much on average each type of household devotes to the different expenditures. It also includes a z-test performed to investigate whether differences in the means of the budget share devoted to a particular group of expenditure exist between households receiving and not receiving remittances. The reported p-values indicate that the null hypothesis of equal means between households receiving internal remittances versus those who do not has

to be rejected for food and housing and land expenditures. In particular, households receiving domestic remittances spend 4 percentage points more on food and around 3 percentage points less on housing and land compared to those households without remittances. Differences also exist when we compare households receiving external remittances versus those who do not. Households receiving international remittances spend 4 percentage points less on food, 3 percentage points more on consumed and durables and almost 2 percentage points more on education. In the case of those households receiving remittances from multiple destinations, the z-test indicates that they spend 3 percentage point less on housing & land and almost 3 percentage points more on health compared to those who do not receive remittances.

Table 2.2 - Description of the expenditure categories

Category	Description	Average budget share
Food	cereals, legumes, oilseeds, tubers, vegetables, fruit, meat etc.	0.364
Consumed and durables	clothing, footwear, cost of mobile phone, internet, luxury goods, utilities, appliances, vehicles, computer, electronic goods.	0.301
House& Land	house, land, home improvement, rent, mortgage, loan repayment	0.067
Investment	productive assets, setting a business, open a store, farming equipment.	0.015
Education	books, school supplies, uniforms, registration fees.	0.050
Health	doctor fees, lab fees, hospitalization, prescription.	0.077
Other goods	include expenditure on wedding, engagement, funerals.	0.122

Table 2.3 – Average budget shares for each commodity by remittance status

	Food	Consumed& Durables	House&Land	Investment	Education	Health	Other
Internal remittances	0.408	0.281	0.043	0.014	0.051	0.801	0.120
No remittances	0.366	0.296	0.799	0.013	0.045	0.072	0.124
P-value	*0.001***	*0.193*	*0.000****	*0.798*	*0.151*	*0.193*	*0.613*
External remittances	0.325	0.329	0.068	0.0196	0.063	0.075	0.117
No remittances	0.366	0.296	0.799	0.013	0.045	0.072	0.124
P-value	*0.000****	*0.001****	*0.212*	*0.151*	*0.000****	*0.559*	*0.364*
Internal & External remittances	0.37	0.289	0.434	0.18	0.043	0.102	0.130
No remittances	0.366	0.296	0.799	0.013	0.045	0.072	0.124
P-value	*0.712*	*0.642*	*0.00****	*0.423*	*0.807*	*0.000****	*0.657*

Notes:

(1) P-values show the level of significance at which we can reject the hypothesis of equal means between the sample proportion of remittance-receiver and non-receiver households

2.5 Methodology

Our main objective is to estimate, using the well-known Working-Leser model, how remittances affect the expenditure behaviour at the margin. However, since the Working-Leser model uses OLS estimates, we need to first address the concern that those estimates may be biased due to endogeneity. An instrumental variable approach is generally used to deal with the endogeneity of the remittances variable. However, due to data limitation the identification of a suitable instrument is not possible in our case.[14] McKenzie *et al.* (2010) and McKenzie and Sasin (2007) provide evidence that when a good instrument is not available, among the non-experimental methods, propensity score matching performs comparatively well. Instead a poor instrument increases considerable the bias. They suggest to perform a sensitivity analysis – comparing various methods and/or various instruments – when there is no a good instrument.

We therefore employ propensity score matching (PSM) as an alternative approach and we implement various matching methods as robustness for our results (see Clément, 2011; Equivel and Huerta-Pineda, 2007). -Both PSM and OLS estimators are implemented. Both matching strategies and OLS are based on the conditional independence assumption. It is required to give matching estimates and regression coefficients a casual interpretation.[15] The similar related strategies are closed in term of results obtained and they provide robustness for assessing the average impact of remittances on household budget shares. Even if we are not able to control for selection on unobservables, the control strategies implemented made us confident that the bias coming from not addressing the issue of endogeneity is not too large.

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[14] A valid instrument has to be (I) relevant in explaining the probability of receiving remittances and (II) exogenous to the household expenditure behaviour. We constructed several variables which have failed to be adequate instruments. For example, using the information provided by the World Bank in the section Climate Change Knowledge Portal, we have constructed the average level of rainfall by region and district for the period 1990-2009. Empirical studies show that migration is driven by rainfall shock (Munshi, 2003). Given that Senegal has experienced severe rainfall deficits we have assumed that migration and remittances have been affected by droughts. Unfortunately, the potential instrument constructed was insignificant in explaining the probability of receiving remittances: on Table 2.2A, in the appendix, we show that the average level of rainfall by district does not determine internal and/or external remittances in Senegal. Other variables we tried to use as instrument are: level of unemployment in rural-urban areas in 1994-1995; amount of remittances received in 1992 by regional level; percentage of internal and external migration by region for several years; level of migration by ethnic group in 2004. These variables were constructed using information from *The Agence Nationale De La Statistique et De La Demographie* (ANSD); unfortunately they failed to be suitable instruments.

[15] Based on this consideration Angrist and Pischke (2002) note that both methods are control strategies and OLS is a just a particular sort of weighted matching estimator (pp. 69-90).

The basic idea of the PSM is to estimate the average treatment effect related to the receipt of remittances on the outcome of interest. In particular, we compare the average expenditure behaviour of those households receiving remittances with those who do not receive remittances, matching the two groups of households according to similar characteristics. The difference in behaviour will then be attributed to the existence of remittances.

The treatment is expressed through a dummy variable D_j equal to one if household *j* receives remittances and zero if it does not. Let Y_{ij1} and Y_{ij0} indicate the outcome variables representing the budget share in good *i* for household *j* in presence and absence of the treatment, respectively. The budget share in good *i* for household *j* is expressed as $Y_{ij} = c_{ij}/exp_j$; where c_{ij} is the consumption in good *i* for family *j* and exp_j indicates the total household expenditure. The treatment effect is the difference in the relevant outcome for unit *j* between the situation in which the treatment occurs and the one in which it does not occur.

$$\Delta Y_{ij} = E(Y_{ij1} \mid D_j = 1) - E(Y_{ij0} \mid D_j = 1) \tag{2.1}$$

The problem is that we do not observe the same unit under the two different states: we can estimate $E(Y_{ij1}|D_j=1)$ and $E(Y_{ij0}|D_j=0)$ but not their counterfactuals $E(Y_{ij1}|D_j=0)$ and $E(Y_{ij0}|D_j=1)$. Propensity score matching represents a solution to the potential bias coming from the unobservability of the counterfactual outcomes.

The methodology consists in generating a single index value – the propensity score – which summarizes the pre-treatment characteristics of each subject and makes it possible the matching between those who receive the treatment and those who do not. The propensity score, which can be expressed as $P(X) = P(D_j=1|X)$, represents the probability of receiving the treatment conditional on observed covariates. As suggested by Rosenbaum and Rubin (1983, 1985), the use of the propensity score reduces the dimensionality of the matching which becomes a problem when there are n-vectors of covariates. The comparison between treated and not treated units, on the basis of observable characteristics, assumes that assignment to the treatment is random and unobservables play no role in the treatment assignment (Dehejia and Wahba, 2002). The

propensity score matching methods expect that given a set of observable variables X, the outcome of interest is independent of the treatment participation. This condition is known as *conditional independence assumption* and it requires that only those covariates which are not affected by receiving remittances should be included in the model. The conditional independence assumption is expressed as:

$$(Y_{ij0}, Y_{ij1}) \perp D_j \mid X_j$$

$$(Y_{ij0}, Y_{ij1}) \perp D_j \mid P(X_j) \tag{2.2}$$

A further requirement is the *common support* or *overlap condition* which states that individuals with the same characteristics have equal positive probability to receive or not the treatment.

$$0 < \Pr(D_j = 1 \mid X_j) < 1 \tag{2.3}$$

These assumptions (2.2) and (2.3) ensure that observations with the same propensity score must have the same distribution of observable characteristics independently of the treatment status. This implies that the exposure to the treatment is random. Following that it is possible to express the counterfactual as:

$$E(Y_{ij0} \mid D_j = 1, X_j) = E(Y_{ij0} \mid D_j = 0, X_j) \tag{2.4}$$

And finally, the PSM estimator for the average treatment effect on the treated (ATT) is simply "the mean difference in the outcomes over the common support, appropriately weighted by the propensity score distribution of participants" (Caliendo and Kopeining, 2008, p. 4):

$$\Delta Y_{ij} = E(Y_{ij1} \mid D_j) = 1, P(X_j) - E(Y_{ij0} \mid D_j = 0, P(X_j) \tag{2.5}$$

Given that the participation to the treatment is expressed as a dichotomous variable, the estimation of the propensity score over a set of covariates uses logit or probit models. Empirical studies have adopted several matching methods and we are

going to perform and compare the most widely used. Overall, the matching estimators ensure that treated and comparison units with propensity score sufficiently close are matched.

The *nearest neighbour* consists in searching for each treated unit the closest control unit in term of propensity score. Then the difference for each pair of matched units is computed and the ATT is obtained as average of all these differences. The method can be implemented with or without replacement. We choose the non-replacement option instead of the one with replacement to avoid the possibility that the same comparison unit is used for several matches.[16] With this method each treated unit finds its match but the closest comparison unit does not always lead to the best match. The generalization of this method allows the use of more than one counterfactual for each treated unit. The *nearest five neighbours* and the *nearest ten neighbours* are commonly used and they refer respectively to the closest five and ten comparison units for each treated individual. The *radius caliper* estimator overcomes the issue of a poor match when the closest propensity score of the comparison unit is far away from the one of the treated unit. It imposes a tolerance level (the caliper or propensity range) on the maximum distance between the propensity scores. As proposed by Dehejia and Wahba (2002) the methodology consists in matching each treated unit with those control units whose propensity score falls into a neighbourhood of the propensity score of the treated unit. The caliper defines the dimension of the neighbour; a small caliper increases the quality of the matches but if it is too small a possible risk is that there are no comparison units inside the neighbour and it remains empty: a treated unit does not find its match. Following Clément (2011), we fix the caliper at 0.05. Finally, the *kernel* method matches each treated unit with a weighted average of all control units (Gaussian kernel). Weights are inversely proportional to the distance in term of propensity score between treated and control observations. Therefore, those comparison units close to the treated individuals will have higher weights.

Each of the methods introduced above presents advantages and drawbacks in term of trade-off between quality and quantity of the matches. Because none of them is superior to another and their performance depends on the data used in the research, their

[16] If replacement is chosen then the same comparison unit can be matched with more than one treated unit.

joint implementation can be used as robustness check. Moreover, in our study we conduct separate analysis with respect to the origin of remittances. Three mutually exclusive treatments can occur: receiving only internal remittances; receiving only remittances from abroad; receiving remittances from both destinations. The households participating in one of these treatments are matched one at a time with those who do not receive remittances.

The propensity score matching methods estimate the average impact of receiving remittances on different household expenditures. That gives some insights into the role of remittances on the different types of consumption but unfortunately it does not allow us to capture whether relevant differences exist at the marginal expenditure behaviour among households receiving and non-receiving remittances. The marginal budget shares can be easily calculated implementing the Working-Leser model with a simple OLS analysis.

First we need to be sure that the average effect of remittances on the household consumption pattern is in line with the results found applying the matching methods. The functional form for the budget share in good i for household j (Y_{ij}) includes the same household characteristics X_j used to generate the propensity score in the matching process:

$$Y_{ij} = \alpha_i + \gamma_i X_j + \theta_i D_j + u_{ij} \tag{2.6}$$

where u_{ij} is the idiosyncratic shock with mean zero and constant variance which captures the unknown variation in the i^{th} budget share for the j^{th} household. In this set-up, D_j is a vector of mutually exclusive binary variables capturing whether or not the household j receives remittances from one destination instead of another.[17] Our exclusive dummy variables are: receiving internal remittances only; receiving remittances from abroad only; receiving remittances from internal and external destination; receiving no remittances. This last category represents the base group for the empirical analysis. We focus our attention on the estimates of θ_i vector which

[17] The use of binary measures for whether or not households receive remittances is a common approach followed by Adams and Cuecuecha (2010a), Castaldo and Reilly (2007), Zarate-Hoyos (2004). It is justified by the fact that monetary values for remittances may be affected by measurement errors.

shows the effect of the different types of remittances on the relevant budget share and we compare those impacts with the results coming from the matching methods. If receiving remittances shows the same effect on the household budget share allocated to specific types of goods then the model presented in equation (2.6) can be extended to include the total household expenditure exp_j:

$$Y_{ij} = \alpha_i + \beta_i \log \exp_j + \gamma_i X_j + \theta_i D_j + u_{ij} \tag{2.7}$$

The functional form expressed in equation (2.7) is the popular Working-Leser Model which relates budget shares linearly to the logarithm of total household expenditure.[18]

As mentioned above, we are not only interested to have some insights on the role of remittances on the different types of consumption but our main attention goes to capture whether relevant differences exist in the marginal expenditure behaviour among households receiving and not receiving remittances. The marginal budget share for good i and household j is the defined as follows:

$$mbs_{ij} = \frac{\partial c_{ij}}{\partial \exp_j} \tag{2.8}$$

From equation (2.7), the partial derivative of the budget share with respect to the total consumption is given by:

$$\frac{\partial Y_{ij}}{\partial \exp_j} = \frac{\exp_j \dfrac{\partial c_{ij}}{\partial \exp_j} - c_{ij} \dfrac{\partial \exp_j}{\partial \exp_j}}{\exp_j^2} = \frac{\beta_i}{\exp_j} \tag{2.9}$$

Solving for $\dfrac{\partial c_{ij}}{\partial \exp_j}$ in equation (2.9) we find:

[18] The chosen functional form displays several advantages: it provides a good statistical fit to a wide range of commodities, the slope is free to change with the expenditure level and it conforms to the criterion of additivity ($\sum C_{ij} | exp_j = 1$); $\sum C_{ij}$ indicate the sum of each items consumed by the household j.

$$mbs_{ij} = \beta_i + \frac{c_{ij}}{\exp_j} = \beta_i + Y_{ij} \tag{2.10}$$

Eq. (2.10) can be calculated after estimating equation (2.7).
Using the definition of elasticity,[19] the expenditure elasticity of good *i* for household *j* is given by the following expression:

$$e_{ij} = \left(\beta_i + Y_{ij}\right)\frac{1}{Y_{ij}} = \frac{\beta_i}{Y_{ij}} + 1 \tag{2.11}$$

Given that our main interest is to capture whether behavioural changes exist at the marginal level we interact the log of total expenditure with the mutually exclusive dummy variables controlling for the different remittances status. The Working-Leser model expressed in equation (2.7) becomes:

$$Y_{ij} = \alpha_i + \beta_i \log \exp_j + \gamma_i X_j + \theta_i D_j + \beta_i^* D_j \log \exp_j + u_{ij} \tag{2.12}$$

Our focus is mainly on the vector β_i^* which allows us to compute marginal budget shares and expenditure elasticities for the three household remittances status. [20] In particular the marginal budget shares and demand elasticities for those who receive remittances (nationally, internationally or from both destinations) are:

$$mbs_{ij} = \beta_i + \beta^*{}_i + Y_{ij} \tag{2.13}$$

$$e_{ij} = \frac{\beta_i + \beta_i^*}{Y_{ij}} + 1 \tag{2.14}$$

Eqs (2.10) and (2.11) apply for those who do not receive remittances.

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[19] $e_{yx} = \frac{\partial y}{\partial x}\frac{x}{y}$

[20] For simplicity we use the same notation for the three different sources of remittances.

In modelling the impact of remittances on household expenditure we face some econometric issues. First, we find an important percentage of zeroes in some of the expenditure categories considered.[21] The problem of zero expenditure is common in many household expenditure surveys. Zero observations may arise for mainly three reasons: non-consumption, the good is not affordable or infrequency of purchases.[22] We are not able to distinguish the behavioural from the random zeroes, which is why we do not address the problem of zero expenditure with a Tobit model.

Second, remittances may be endogenous reflecting migrant's earnings and unobservable individual and household characteristics that may also affect the migration decision.[23] In our analysis, the use of different matching estimators in the first place and then the close results that we find implementing the OLS to estimate the household budget shares make us quite confident of the robustness of our results even if we do not address the issue of endogeneity of remittances. Moreover, not taking the problem of selection into account can bias the results only if receiving remittances are perceived as transitory income or they cause a behavioural change with respect to family expenditure decision. Endogeneity of migration should not be an issue when remittances are treated just as income and the household does not differentiate among the different sources of income. The advantage of using the OLS estimation technique is that it makes it simpler to compute the marginal budget shares and demand elasticities as presented above.

2.6 Results

2.6.1 Estimates from PSM

Household expenditures reflect family preferences for consumption and household characteristics are very important to understand how income is allocated

[21] Zeroes in the expenditure accounts for less than 2 per cent in the case of food and consumed-durables; around 17 per cent for health; 33 per cent for education; 69 per cent for housing and land; 90 per cent for investment.

[22] The case of non-consumption represents a utility maximizing solution; differently, income constraint is the reason explaining why the good is not affordable; the case of infrequency of consumption occurs when the period considered by the survey is not long enough: different type of expenditures have different periodicity.

[23] Many empirical studies, using a two stage selection approach with instrumental variables, conclude that migration is a selective problem and that failing to consider it leads to unbiased estimates. Unfortunately we were not able to implement an instrumental variables approach because we failed to identify an adequate instrumental variable. However, the different estimations techniques are used as robustness check in our analysis.

among different types of goods. Table 2.4 contains the summary statistics of the variables - household composition variables and household head characteristics - used to investigate the average budget shares, which are then used to estimate the propensity scores. The propensity scores are computed respectively for receiving internal remittances only, receiving external remittances only and receiving from both sources.

The estimation of the propensity scores reveals the effect of each covariate on the probability to receive remittances and given that the dependent variable is a binary outcome the logit model is used to compute the propensity scores. Table 2.5 shows the logistic regressions for the three mutually exclusive remittances status; the marginal effects are reported on Table 2.1A – Appendix A. Most of the explanatory variables have the expected sign. The probability of receiving remittances from any destination increases with the household size; the proportion of children in the household - both in the case of infant and toddlers (0 to 4 years) and children of school going age (5 to 15) - increases the probability of receiving domestic remittances but it is insignificant in the case of international transfers. Conversely, the probability of receiving international transfers increases with the proportion of elderly in the household. Moreover, the proportion of women in the household increases significantly the probability of receiving remittances from any destination. Intuitively, this evidence show that transfers help to mitigate dependence in the case of vulnerable members (Clément, 2011). Households driven by women are more likely to be in one of the three remittances status and overall the probability of receiving one of the three treatments increases with the age of the household head. Moreover, we are interested in capturing the effect of the age of the household head when the household is driven by a woman to see whether the gender of the household head matters in the probability of receiving remittances. Therefore, we interact the dummy variable indicating whether the household is driven by a woman with her age. We find that how the age of women head increases the probability of receiving remittances decreases.

The secondary level of education of the household head has a positive effect on the probability of receiving international remittances; conversely, when the household head has tertiary education there is a negative effect on the probability of receiving domestic remittances and this negative impact is capture in the case of receiving transfers from multiple destinations. Holding agricultural land does not have

any impact on the probability of receiving internal or external transfers. However it has some impact when both types of transfers are received.

Overall, we find robust results across the different methods of matching for the various types of expenditures. However, the Gaussian kernel estimator performs better in term of bias reduction in each treatment setting; For each exogenous variable, Table 2.6 reports the bias before and after the matching and the achieved percentage reduction in bias using the kernel estimator: the Gaussian kernel estimator removes most of the bias between the treated and non-treated groups. [24] With few exceptions, the proportion of bias reduction for each variable after the matching ranges between 50 and 90 per cent. The only variable for which the differences between the two groups is not eliminated is household head having secondary education when the treatment is receiving both domestic and external remittances However, the bias is quite small before matching and moreover this variable does not have any impact on the probability of receiving the treatment. Finally, the *t*-test shows that for each variable there is no significant difference in the mean after the matching.

[24] The bias is defined as the difference of the mean values of the treatment group and non-treatment group divided by the square root of the average sample variance in the treatment group and the not matched non treatment group.

Table 2.4: Summary statistics of the variables used in the estimations

Variables	Mean
Budget share of Food	0.364
	(0.191)
Budget share of Consumed and Durable goods	0.301
	(0.178)
Budget share of House&Land	0.0067
	(0.151)
Budget share of Investment	0.015
	(0.738)
Budget share of Education	0.050
	(0.072)
Budget share of Health	0.077
	(0.100)
Budget share of Other goods	0.122
	(0.140)
Log of total Household Expenditure	14.706
	(0.896)
Household size	9.173
	(5.674)
Proportion of children (0-4)	0.121
	(0.127)
Proportion of children (5-15)	0.246
	(0.178)
Proportion of elderly	0.061
	(0.107)
Proportion of women	0.341
	(0.174)
Having agriculture land (yes=1)	0.412
Household Head gender (Female=1)	1.298
Age of the Household Head	52.974
	(14.860)
HH head has secondary education	0.149
HH head has tertiary education	0.077
HH receiving no remittances (yes=1)	0.488
HH receiving Internal remittances (yes=1)	0.168
HH receiving External remittances (yes=1)	0.248
HH receiving Internal and External remittances (yes=1)	0.093

Notes:
(1) No. of Observations:1939
(2) Standard deviation in parentheses (for continuous variable only)

Table 2.5: Logit regression for the remittance receipts.

VARIABLES	Internal remittances	External remittances	Internal&External remittances
Household size	0.019**	0.049***	0.069***
	(0.009)	(0.008)	(0.010)
Prop of children (0 – 4)	1.235***	0.442	1.24**
	(0.356)	(0.324)	(0.490)
Prop of children (5 – 15)	1.058***	0.362	1.079***
	(0.289)	(0.253)	(0.397)
Prop of elderly	0.560	0.942**	1.294***
	(0.425)	(0.381)	(0.470)
Prop of women	0.774**	0.707***	1.738***
	(0.308)	(0.259)	(0.408)
Owning agriculture land	0.121	0.108	0.208*
	(0.087)	(0.080)	(0.110)
HH head (=female)	2.127***	1.921***	2.326***
	(0.341)	(0.299)	(0.458)
Age of the HH head	0.041***	0.022***	0.052***
	(0.008)	(0.007)	(0.011)
HHhead*age	-0.029***	-0.020***	-0.032***
	(0.006)	(0.005)	(0.008)
HH head with secondary educ	-0.0198	0.280***	0.227
	(0.124)	(0.104)	(0.148)
HH head with tertiary educ	-0.328*	0.135	-0.431*
	(0.178)	(0.134)	(0.259)
Constant	-4.463***	-3.682***	-6.480***
	(0.508)	(0.432)	(0.695)
Observations	1,275	1,430	1,130
Log-likelihood	-659.61	-807.46	-406.48

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

Table 2.6: Balancing tests for the propensity score matching – Gaussian Kernel estimator.

	Sample	%bias	%reduction in bias	t- test
Internal Remittances				
Household size	Unmatched	22.8		3.53***
	Matched	-0.8	96.3	-0.10
Prop of children (0 – 4)	Unmatched	20.3		3.18***
	Matched	-0.1	99.7	-0.01
Prop of children (5 – 15)	Unmatched	28.1		4.31***
	Matched	2.0	92.9	0.26
Prop of elderly	Unmatched	4.0		0.58
	Matched	1.7	57.8	0.21
Prop of women	Unmatched	15.8		2.35**
	Matched	2.7	82.9	0.35
Owning agriculture land	Unmatched	11.8		1.84*
	Matched	-3.4	71.0	-0.43
HH head (= female)	Unmatched	45.4		7.51***
	Matched	4.3	90.6	0.49
Age of the HH head	Unmatched	5.6		0.88
	Matched	3.0	45.5	0.38
HHhead*age	Unmatched	32.6		5.12***
	Matched	6.4	80.4	0.81
HH head with secondary educ	Unmatched	-9.0		-1.37
	Matched	2.0	78.0	0.27
HH head with tertiary educ	Unmatched	-27.9		-3.91***
	Matched	-4.6	83.4	-0.75
External Remittances				
Household size	Unmatched	30.0		5.56***
	Matched	4.3	85.8	0.63
Prop of children (0 – 4)	Unmatched	7.9		1.40
	Matched	4.6	42.2	0.72
Prop of children (5 – 15)	Unmatched	12.1		2.15*
	Matched	5.6	54.2	0.86
Prop of elderly	Unmatched	6.9		1.19
	Matched	-6.2	10.7	-0.80
Prop of women	Unmatched	34.9		6.13***
	Matched	-3.4	90.3	-0.48
Owning agriculture land	Unmatched	-2.2		-0.39
	Matched	-1.8	18.1	-0.28
HH head (=female)	Unmatched	63.3		11.83***
	Matched	0.9	98.5	0.13
Age of the HH head	Unmatched	3.9		0.71
	Matched	2.0	49.9	0.30
HHhead*age	Unmatched	46.1		8.43***
	Matched	1.6	96.4	0.24
HH head with secondary educ	Unmatched	8.6		1.56
	Matched	-1.6	82.0	-0.23
HH head with tertiary educ	Unmatched	-9.3		-1.63
	Matched	-0.5	94.6	-0.08

	Sample	%bias	%reduction in bias	t- test
Internal&External Remittances				
Household size	Unmatched	63.0		9.35***
	Matched	-1.3	97.9	-0.12
Prop of children (0 – 4)	Unmatched	14.9		1.78*
	Matched	4.7	68.3	0.47
Prop of children (5 – 15)	Unmatched	16.5		2.00*
	Matched	7.5	54.7	0.73
Prop of elderly	Unmatched	27.5		3.25***
	Matched	-6.0	78.3	-0.46
Prop of women	Unmatched	36.2		4.31***
	Matched	0.4	98.8	0.04
Owning agriculture land	Unmatched	23.5		2.93**
	Matched	4.7	79.9	0.44
HH head (=female)	Unmatched	35.9		4.78***
	Matched	5.5	84.7	0.47
Age of the HH head	Unmatched	48.4		6.14***
	Matched	-3.6	92.6	-0.33
HHhead*age	Unmatched	54.1		6.65***
	Matched	1.5	97.2	0.14
HH head with secondary educ	Unmatched	0.5		0.06
	Matched	-2.9	-486.1	-0.26
HH head with tertiary educ	Unmatched	-34.0		-3.53***
	Matched	-3.3	90.3	-0.46

The results of the average treatment effect on the treated (ATT) using the different matching estimators are reported in Table 2.7. According to the t-statistics there is no difference between treated and control groups in the allocation of the budget share when the treatment is identify in receiving internal remittances with the exception of housing and land. Household receiving internal transfers invest less on housing and land: which is in line with Clément (2011) who finds that internal remittances decrease the proportion of expenditure devoted to housing and agriculture and concludes that internal remittances are used in non-productive expenditure.[25] Overall, we conclude that internal remittances do not change household behaviour.

[25] This finding is not supported by the one nearest neighbour estimator which does not provide evidences of differences in behaviour between treated and controls units with respect to expenditure on housing&land. However, the t-value reported by the one nearest neighbour is very close to the significant level and the relationship between receiving internal transfers and expenditure on housing and land is negative. We conclude that the fact that the t-statistic is slightly below the significant level may depend on a bad quality of matching – which is a problem that can occur when only one control unit is used for comparison.

Table 2.7: Propensity score estimates

	Nearest neighbour		Five Nearest neighbour		Ten Nearest neighbour		Kernel		Radius caliper (0.05)	
	ATT	t	ATT	t	ATT	t	ATT	t	ATT	t
INTERNAL REMITTANCES										
Food	0.017	1.15	0.010	0.72	0.015	1.06	0.015	1.15	0.016	1.18
	(0.015)		(0.014)		(0.014)		(0.013)		(0.013)	
DC GOODS	-0.006	-0.49	0.002	0.21	0.002	0.21	0.003	0.29	0.003	0.29
	(0.013)		(0.013)		(0.013)		(0.012)		(0.012)	
House&land	-0.016	-1.56	-0.018	**-1.83***	-0.018	**-1.85***	-0.020	**-2.11****	-0.021	**-2.15****
	(0.010)		(0.010)		(0.009)		(0.009)		(0.009)	
Investment	0.001	0.39	0.004	0.85	0.002	0.52	0.001	0.36	0.001	0.35
	(0.005)		(0.004)		(0.005)		(0.004)		(0.004)	
education	0.004	0.92	0.005	1.08	0.004	0.85	0.006	1.33	0.006	1.30
	(0.005)		(0.005)		(0.004)		(0.004)		(0.004)	
health	0.003	0.47	0.006	0.82	0.007	0.97	0.007	1.08	0.007	1.05
	(0.007)		(0.007)		(0.007)		(0.006)		(0.006)	
other	-0.005	-0.51	-0.009	-0.93	-0.012	-1.30	-0.013	-1.41	-0.013	-1.37
	(0.010)		(0.010)		(0.009)		(0.009)		(0.009)	
EXTERNAL REMITTANCES										
Food	-0.040	**-3.38*****	-0.037	**-2.90*****	-0.038	**-3.10*****	-0.038	**-3.13*****	-0.038	**-3.16*****
	(0.011)		(0.012)		(0.012)		(0.012)		(0.012)	
DC GOODS	0.019	1.63	0.020	**1.68***	0.025	**2.08****	0.024	**2.08****	0.024	**2.07****
	(0.011)		(0.012)		(0.012)		(0.011)		(0.011)	
House&land	0.003	0.30	-0.007	-0.70	-0.006	-0.64	-0.003	-0.33	-0.003	-0.30
	(0.010)		(0.010)		(0.010)		(0.010)		(0.010)	
Investment	0.006	1.35	0.009	**1.88***	0.009	**1.84***	0.009	**1.81***	0.009	**1.80***
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
education	0.016	**3.08*****	0.015	**2.91*****	0.016	**3.22*****	0.016	**3.26*****	0.016	**3.27*****
	(0.005)		(0.005)		(0.005)		(0.005)		(0.005)	
health	-0.001	-0.23	0.0007	0.11	0.0009	0.16	-0.001	-0.24	-0.001	-0.21
	(0.005)		(0.006)		(0.006)		(0.006)		(0.006)	
other	-0.003	-0.44	-0.001	-0.21	-0.006	-0.71	-0.006	-0.76	-0.007	-0.79
	(0.008)		(0.009)		(0.009)		(0.009)		(0.009)	
INTERNAL& EXTERNAL REMITTANCES										
Food	0.003	0.16	0.003	0.16	0.004	0.24	-0.004	-0.27	-0.005	-0.31
	(0.020)		(0.018)		(0.018)		(0.017)		(0.017)	
DC GOODS	0.008	0.46	-0.006	-0.34	-0.003	-0.19	0.001	0.07	0.002	0.14
	(0.019)		(0.017)		(0.017)		(0.016)		(0.016)	
House&land	-0.011	-0.89	-0.017	-1.40	-0.016	-1.40	-0.016	-1.30	-0.016	-1.33
	(0.013)		(0.012)		(0.011)		(0.012)		(0.012)	
Investment	0.004	0.61	0.006	0.84	0.006	0.82	0.005	0.72	0.005	0.76
	(0.007)		(0.007)		(0.007)		(0.007)		(0.007)	
education	-0.001	-0.24	-0.003	-0.48	-0.005	-0.79	-0.002	-0.40	-0.002	-0.38
	(0.007)		(0.006)		(0.006)		(0.006)		(0.006)	
health	0.021	**1.76***	0.025	**2.23****	0.020	**1.87***	0.021	**1.95***	0.021	**1.95***
	(0.012)		(0.011)		(0.011)		(0.011)		(0.011)	
other	-0.025	-1.64	-0.008	-0.62	-0.006	-0.47	-0.005	-0.39	-0.005	-0.41
	(0.015)		(0.014)		(0.013)		(0.013)		(0.013)	

Notes: (1) DC goods is consumed and durable goods; other includes expenditure on wedding, engagement and funeral. (2) Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Moreover, the results in Table 2.7 show that that receiving external remittances versus no remittances impact negatively the proportion of expenditure on food and positively the household budget share on consumed and durable goods.[26] More importantly, households receiving external transfers spend more on education and investment. The results are consistent across the different matching estimators. These results give some positive signs that remittances are used for investment purposes. Finally, we do not find significant differences in the expenditure behaviour when both internal and external remittances are received, except for expenditure on health. Households receiving transfers from both internal and external destinations spend more on health compared to those who do not receive any transfers. Clément (2011) finds this positive relationship between expenditure on health and receiving remittances in the case of internal transfers. He interprets expenditure on health as a short-term necessity and he does not conclude for a productive use of domestic transfers. In our case, we are not able to know which type of remittances – internal or external – weighs more in the household consumption behaviour. We cannot conclude that more expenditure on health drives to a productive use of remittances because it could be a short-term necessity.

2.6.2 Ordinary Least Squares and the Working-Leser Model

Using a simple OLS model to estimate the functional form expressed in equation (2.6), we compare the effect of remittances on different budget shares with the matching estimates. The mutually exclusive remittance statuses are expressed as dummy variables and their effect are jointly estimated with the household characteristics. The results are presented on Table 2.8. We find that the sources of remittances have different effects on how expenditure is allocated among the type of commodities. Regarding internal sources, households receiving internal remittances spend 1 per cent less on housing and land. The other household expenditures are not affected by receiving domestic remittances. The matching estimators do not report any impact of internal remittances on household expenditure behaviour except for housing and land for which a negative impact is captured. Looking at the impact of external

[26] The effect is consistent with respect to the various matching methods except for the nearest neighbour for which the t value is not significant. We suppose that is not always possible to reach good matches when only one comparison unit is used in the matching.

remittances on household budget shares we find that the expenditures affected are food, durable and consumed goods, education and investment. In particular, receiving external remittances decreases the expenditure on food by 4 per cent, increases the expenditure on durable and consumed goods by 2 per cent and the budget share allocated to education by 1 per cent. These results are in line with those found with the matching methods. Finally, receiving both internal and external transfers increases expenditure on health while it does not affect any other type of expenditure. Even if we do not address the issue of endogeneity, as a suitable instrument was not found, we are quite confident on the good performance of the alternative methods implemented. We conclude that overall the OLS estimates of the effect of remittances on household expenditure behaviour are consistent with the average treatment effect on the treated calculated with the matching methods and this evidence allows us to rely on them. Moreover, the OLS technique makes it possible to evaluate the impact of household characteristics on their expenditure behaviour.

As presented on Table 2.8, we find that across the different types of household expenditures, gender and age of the household head are not relevant in the way the budget share is allocated; it is rather head's level of education that plays an important role in this decision. The composition of the household is important for understanding how the expenditure is allocated. The average budget share on food decreases as the size of the household increases, however the effect is quite small and as expected more important is the proportion of children in the household which shows a level of significance of 1 per cent. Infant/toddlers and children of school going age increase the expenditure on food by 13 and 15 per cent respectively. Households holding agricultural land spend 4 per cent more on food. We expected to find the contrary impact and it may depend on the low productivity of the soil due to rainfall shocks. Finally, better educated household heads decrease the share of expenditure on food by 10 (14) per cent when they have secondary (tertiary) education.

Looking at the budget share devoted to consumption and durable goods, we find that as the proportion of children increases, the expenditure on these goods decreases by 10 per cent when infant/toddlers are considered and by 9 per cent for children of school going age. Conversely, the proportion of elderly increases the expenditure on durables by 11 per cent. Households with agricultural land spend less on

durables. Those households with a head holding secondary and tertiary education increase the expenditure on consumed and durable goods by 2 and 4 per cent respectively. We believe that better educated individuals not only are more likely to have a higher level of income compared to the less educated ones but they perhaps buy better quality and technological goods more, hence spend more on them. Expenditure on housing and land is negatively affected from all the variables regarding household compositions; only the level of education of the household head has positive impact on this type of expenditure. The secondary level of education of the household head increases the expenditure on housing and land of 4 per cent and of 9 per cent when the head has tertiary education.

The decision to devote a part of the total budget share to education is considered a way to invest in human capital and as expected, households with higher proportion of young family members of school going age– between 5 and 15 - increase the expenditure on education of 5 per cent. Conversely, expenditure on education decreases by 4 per cent with the proportion of infants and toddlers in the household. Also, as could be expected, the level of education of the household head is an important determinant of how much to spend on human capital: a head with secondary education increases the household expenditure on education of 2 per cent and 3 per cent when he/she has tertiary education.

Expenditure on investments is not determined by the household composition. We find a positive effect of owning agricultural land on the decision to invest, as the category of investment includes expenditure on farming equipment and, as expected, those owning land are more likely to make this type of investment. The expenditure on investment goods decreases by 2 per cent if the head of the household is a woman.

Expenditure on health is an indicator of the household well-being and it could also be important in raising labour productivity. Surprisingly, the share of expenditure on health does not depend on any of the household composition variables and a very small effect is given by the age of the household head. Households with older head spend slightly more on health, though a head with tertiary education decreases the household expenditure on health by almost 2 per cent. A possible explanation for it is that households with better educated individuals conduct a healthy life: better quality of food and life style which prevent to incur healthy issues. Also, we find that those

households holding agricultural land spend 1 per cent more on health. We assume that for those households agriculture is the main activity and the healthy status of their members is fundamental for the productivity and therefore income of the household.

The last type of expenditure considered includes engagement, wedding and funeral. Larger households spend 0.2 per cent more on those events and also holding agricultural land has positive impact on those expenditures -- agriculture land is an indicator of living in rural areas where traditions are stronger.

The presence of an important percentage of zeroes in some of the expenditure categories explains why the R-squared are quite low. As discussed on page 61, we are not able to distinguish among the different nature of zeroes. Zero could represent the choice of no purchase as well as the problem of income constraints or the fact that different expenditures have different periodicity. The OLS method does not make any assumption on the nature of the zeroes keeping the different reasons possible. It is true that when the reason behind the zeroes is different from non-consumption (choice of non-consumption) the OLS is downward biased; however the magnitude of the bias is invariant to the fraction of zero observations in the data.

Overall, the OLS estimates of the impact of the three different sources of remittances on the household expenditure behaviour are consistent with the average treatment effect of remittances on the different budget shares. This evidence allows us to extend the model including the log of total household expenditure. In Table 2.9 we report the OLS estimates of the Working-Leser model. The coefficients corresponding to the logarithm of total expenditure allow us to compute the marginal budget shares and expenditure elasticities of the commodities considered. On average, as total annual expenditure increases, households spend 10 per cent less on food while its impact on the budget share devoted to housing and land, health and other goods is positive and strongly significant. As the total annual expenditure increases, households spend 5 per cent more on housing and land, 1 per cent more on health and 2 per cent more on other type of goods. A small positive impact is captured for expenditure on investment which rises by 0.6 per cent when total annual expenditure increases.

The introduction of the log of total annual expenditure as extra covariate in the estimation of the budget shares does not affect the impact of internal remittances on the house and land expenditure which remain negative. The positive effects of receiving

external transfers on the household expenditure on durables goods, education and investment remain strong. However, external transfers do not affect the budget share on food when the total annual expenditure is introduced and we capture a negative impact of international remittances on house and land and other type of goods. Finally, household receiving remittances from diversified destinations spend more on health and again there is a negative impact of expenditure on housing which was not captured in the previous estimations. When we consider the total annual expenditure, independently of the source of remittances, we find that transfers decrease the household share allocated to housing and land.

Table 2.8: OLS estimates of budget share equations

VARIABLES	(1) Food	(2) DC goods	(3) House&land	(4) Investment	(5) Education	(6) Health	(7) Other
Household size	-0.001*	0.000	-0.002***	-0.000	0.000	-0.000	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prop of children (0 – 4)	0.137***	-0.101***	-0.058*	-0.006	-0.039***	0.029	0.043
	(0.035)	(0.033)	(0.032)	(0.014)	(0.012)	(0.019)	(0.027)
Prop of children (5 – 15)	0.156***	-0.095***	-0.090***	0.007	0.058***	-0.005	-0.027
	(0.028)	(0.027)	(0.026)	(0.011)	(0.011)	(0.014)	(0.021)
Prop of elderly	0.028	0.113**	-0.140***	-0.007	-0.047***	0.047	0.009
	(0.052)	(0.054)	(0.028)	(0.012)	(0.014)	(0.032)	(0.032)
Prop of women	0.041	0.029	-0.085***	-0.006	-0.004	0.017	0.013
	(0.028)	(0.031)	(0.029)	(0.011)	(0.011)	(0.0162)	(0.024)
Owning agriculture land	0.048***	-0.091***	-0.020***	0.014***	-0.003	0.014***	0.038***
	(0.009)	(0.008)	(0.006)	(0.003)	(0.003)	(0.005)	(0.007)
HH head (= female)	0.018	-0.022	0.013	-0.025**	0.007	0.018	-0.012
	(0.034)	(0.031)	(0.026)	(0.011)	(0.014)	(0.020)	(0.026)
Age of the HH head	0.000	-0.000	-0.000	-0.000	0.000	0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HH head*age	-0.000	0.001*	-0.000	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HH head with secondary educ	-0.102***	0.019*	0.040***	-0.000	0.026***	0.008	0.005
	(0.010)	(0.011)	(0.012)	(0.004)	(0.005)	(0.007)	(0.008)
HH head with tertiary educ	-0.144***	0.044***	0.090***	-0.010***	0.032***	-0.019**	0.003
	(0.013)	(0.0160)	(0.019)	(0.003)	(0.008)	(0.008)	(0.011)
Internal remittances	0.016	-0.005	-0.016**	0.002	0.006	0.005	-0.010
	(0.011)	(0.010)	(0.008)	(0.004)	(0.004)	(0.006)	(0.008)
External remittances	-0.042***	0.024**	0.001	0.010**	0.017***	0.003	-0.013*
	(0.010)	(0.010)	(0.009)	(0.005)	(0.004)	(0.005)	(0.008)
Internal&External remittances	-0.014	-0.004	4.00e-05	0.006	-0.001	0.023**	-0.010
	(0.015)	(0.013)	(0.010)	(0.007)	(0.005)	(0.010)	(0.012)
Constant	0.297***	0.333***	0.173***	0.048**	0.005	0.025	0.116***
	(0.048)	(0.046)	(0.041)	(0.022)	(0.018)	(0.026)	(0.039)
Observations	1,939	1,939	1,939	1,939	1,939	1,939	1,939
R-squared	0.166	0.155	0.108	0.023	0.067	0.026	0.036

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

Table 2.9: OLS estimates of budget share equations – Working-Leser model

VARIABLES	(1) Food	(2) DC goods	(3) House&land	(4) Investment	(5) Education	(6) Health	(7) Other
Log tot annual expenditure	-0.100***	0.000	0.057***	0.006*	1.79e-05	0.010***	0.025***
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.004)	(0.004)
Household size	0.004***	0.000	-0.005***	-0.000	0.000	-0.000*	0.001*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Prop of children (0 – 4)	0.067**	-0.101***	-0.018	-0.002	-0.039***	0.036**	0.061**
	(0.032)	(0.033)	(0.030)	(0.013)	(0.013)	(0.018)	(0.027)
Prop of children (5 – 15)	0.084***	-0.095***	-0.049*	0.012	0.058***	0.002	-0.009
	(0.027)	(0.027)	(0.025)	(0.011)	(0.011)	(0.014)	(0.021)
Prop of elderly	-0.028	0.113**	-0.107***	-0.004	-0.046***	0.053	0.023
	(0.054)	(0.054)	(0.028)	(0.013)	(0.014)	(0.032)	(0.033)
Prop of women	0.040	0.029	-0.084***	-0.006	-0.004	0.017	0.014
	(0.028)	(0.031)	(0.029)	(0.011)	(0.011)	(0.016)	(0.024)
Owning agriculture land	0.017**	-0.091***	-0.002	0.016***	-0.003	0.018***	0.046***
	(0.008)	(0.008)	(0.006)	(0.003)	(0.003)	(0.005)	(0.007)
HH head (= female)	0.047	-0.022	-0.003	-0.027**	0.007	0.014	-0.019
	(0.031)	(0.031)	(0.025)	(0.011)	(0.013)	(0.020)	(0.026)
Age of the HH head	0.001*	-0.000	-0.000	-0.000	0.000	0.000	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HH head*age	-0.000*	0.001*	-6.20e-05	0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
HH head with secondary educ	-0.047***	0.018	0.010	-0.003	0.026***	0.003	-0.007
	(0.009)	(0.011)	(0.011)	(0.003)	(0.005)	(0.007)	(0.008)
HH head with tertiary educ	-0.045***	0.043**	0.034*	-0.016***	0.032***	-0.029***	-0.021*
	(0.012)	(0.017)	(0.019)	(0.005)	(0.008)	(0.009)	(0.012)
Internal remittances	0.014	-0.005	-0.015*	0.003	0.006	0.006	-0.009
	(0.010)	(0.010)	(0.007)	(0.004)	(0.004)	(0.006)	(0.008)
External remittances	-0.006	0.024**	-0.019**	0.008	0.017***	-0.000	-0.022***
	(0.009)	(0.010)	(0.008)	(0.005)	(0.004)	(0.006)	(0.008)
Internal&External remittances	0.015	-0.004	-0.017*	0.004	-0.001	0.020*	-0.017
	(0.013)	(0.013)	(0.009)	(0.006)	(0.005)	(0.010)	(0.012)
Constant	1.685***	0.323***	-0.620***	-0.045	0.005	-0.123*	-0.231***
	(0.099)	(0.097)	(0.094)	(0.045)	(0.043)	(0.064)	(0.078)
Observations	1,939	1,939	1,939	1,939	1,939	1,939	1,939
R-squared	0.314	0.155	0.185	0.027	0.067	0.032	0.053

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

The marginal budget shares and elasticities for each category of goods considered are computed using eqs. (2.10) and (2.11) and they are reported in Table 2.10. The figures reveal that for one Franc CFA increase in the household's budget expenditure on food rises by 0.26 of a Franc, on consumed and durables by 0.30 of a Franc, on housing and land by 0.12 while on investment just 0.02 of a Franc, on education and health, respectively, 0.05 and 0.08 of a Franc and finally on other expenditures by 0.14 of a Franc. Overall, at the margin, households devote more of their expenditure on consumed than investment goods. Then, the estimates for expenditure elasticities suggest that food is a necessity good and education is classified as normal good while the other commodities are luxury items.[27] We find that education is perceived by the Senegalese households more important that other types of expenditures. We are not able to argue if there is a turning point represented by a particular number of years of schooling in the way households perceive/consider education. But, in general the fact that education is a normal good means that households value education as an important good.

Table 2.10 – Marginal budget shares and expenditure elasticities

	Food	CD goods	House&land	Investment	Educ	Health	Others
Marginal							
budget share	0.263	0.302	0.124	0.022	0.050	0.087	0.147
	(0.006)	(0.006)	(0.006)	(0.003)	(0.002)	(0.004)	(0.005)
Elasticity	0.724	1.002	1.848	1.430	1.000	1.139	1.204
	(0.016)	(0.020)	(0.093)	(0.243)	(0.048)	(0.053)	(0.040)

Robust standard errors in parentheses.

Table 2.11 shows the estimated coefficients for the logarithm of household expenditure and its interaction with different sources of remittances. Our main interest is to determine whether the source of remittances affects the household marginal propensity to consume for each group of commodity considered. The interaction terms are insignificant in almost all budget shares considered, except that for food. The other controls are omitted from the table to conserve space and also because they are not the

[27] The elasticity is greater than one and therefore the demand is relatively responsive to a change in price; the contrary happen for a necessity good for which the elasticity is less than one.

main interest in this analysis. In Table 2.12 we show the marginal budget shares and elasticities for each category of expenditure considered by remittance status. Overall, we do not observe a considerably different pattern of consumption among those household receiving and not receiving transfers as well as the source of remittances does not seem to be relevant in explaining the household behaviour at the margin. For example the estimates on Table 2.12 for the marginal budget shares reveal that for one Franc increase in the household's budget, on average and ceteris paribus, households in receipt of external remittances spend 0.026 of a Franc on investment goods while those households who do not receive remittances spend only 0.019 of a Franc on investments. However, a two-tailed test reveals that this difference is not significant. Again, looking at the marginal budget share devoted to education we find that those households receiving external remittances devote a slightly more amount on education but this difference is not significant. Then, looking at the elasticity of demand it seems that households in receipt of external remittances have a more elastic demand response to house and land, investment and education, again, these estimates are insignificant when we perform a two-tailed test. Table 2.11 and 2.12 provide evidence that the pattern of consumption among different remittance recipient households does not change for effect of remittances.

We conclude that, a first investigation, which only consider the average impact of remittances on the household production behaviour reveals some signs of a productive use of external remittances. However, the effect of remittances is quite modest when we perform a further investigation interacting the log of expenditure with the sources of remittances: the interaction terms are insignificants and there are no significant differences in the marginal budget shares and elasticities among the different remittance recipient households.

In contrast with other recent studies, the evidence on Senegal suggests that remittances are just another source of income. Similar conclusions have been found by Zarate-Hoyos (2004) and Castaldo and Reilly (2007). They use the OLS method in their analysis and they do not deal with endogeneity. We believe that endogeneity is an issue when remittances cause a behavioural change (Adams and Cuecuecha, 2010a); in that case the size of the bias is relevant and do not account for it may lead to misleading conclusions. However, when remittances are just a source of income and the household

does not differentiate among different sources of income endogeneity, even if may exist, should not be an issue in interpreting the results (Castaldo and Reilly, 2007).

Table 2.11 – Estimates of budget share equations with interaction terms

VARIABLES	Food	DC goods	House& Land	Investment	Education	Health	Other
Log tot annual expenditure (exp)	-0.091***	-0.000	0.051***	0.004	-0.001	0.012**	0.025***
	(0.008)	(0.007)	(0.007)	(0.003)	(0.003)	(0.005)	(0.006)
Log(exp)*internal remittances	-0.029**	0.015	0.003	-0.004	0.001	0.000	0.012
	(0.014)	(0.014)	(0.013)	(0.005)	(0.005)	(0.009)	(0.013)
Log(expenditure)*external remittances	-0.005	-0.007	0.015	0.006	0.006	-0.006	-0.009
	(0.011)	(0.012)	(0.013)	(0.008)	(0.007)	(0.006)	(0.009)
Log(exp)*internal& external remittances	-0.049***	0.019	0.012	0.017	-0.004	-0.002	0.005
	(0.016)	(0.019)	(0.015)	(0.011)	(0.005)	(0.014)	(0.015)
Observations	1,939	1,939	1,939	1,939	1,939	1,939	1,939
R-squared	0.319	0.157	0.187	0.032	0.069	0.033	0.055

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

Table 2.12: Marginal budget shares and elasticities

	Food	DC goods	House&land	Investment	Education	Health	Other
Marginal budget share - No remittances	0.273	0.300	0.119	0.019	0.049	0.089	0.148
	(0.008)	(0.007)	(0.007)	(0.003)	(0.003)	(0.005)	(0.006)
Marginal budget share - Internal remittances	0.243	0.316	0.122	0.014	0.050	0.090	0.161
	(0.016)	(0.016)	(0.015)	(0.006)	(0.006)	(0.010)	(0.014)
Two-tailed test (internal vs no remittances)	*-1.562*	*0.848*	*0.209*	*-0.627*	*0.248*	*0.033*	*0.794*
Marginal budget share- External remittances	0.267	0.293	0.135	0.026	0.055	0.083	0.138
	(0.014)	(0.014)	(0.015)	(0.009)	(0.007)	(0.008)	(0.011)
Two-tailed test (external vs no remittances)	*-0.319*	*-0.465*	*0.927*	*0.631*	*0.743*	*-0.652*	*-0.739*
Marginal budget share- Internal & External remittances	0.224	0.320	0.131	0.037	0.044	0.087	0.154
	(0.018)	(0.021)	(0.017)	(0.012)	(0.006)	(0.015)	(0.017)
Two-tailed test (intern&extern vs no remittances)	*-2.432***	*0.861*	*0.675*	*1.359*	*-0.593*	*-0.138*	*0.321*
Elasticity - No remittances	0.749	0.997	1.764	1.255	0.972	1.163	1.208
	(0.023)	(0.025)	(0.110)	(0.245)	(0.064)	(0.069)	(0.052)
Elasticity - Internal remittances	0.669	1.04	1.818	0.951	1.006	1.168	1.312
	(0.045)	(0.054)	(0.230)	(0.418)	(0.118)	(0.138)	(0.119)
Two-tailed test (internal vs no remittances)	*-0.568*	*0.255*	*0.0141*	*-0.009*	*0.012*	*0.002*	*0.097*
Elasticity- External remittances	0.735	0.971	2.000	1.663	1.096	1.079	1.129
	(0.023)	(0.048)	(0.228)	(0.598)	(0.153)	(0.108)	(0.092)
Two-tailed test (external vs no remittances)	*-0.158*	*-0.140*	*0.062*	*0.009*	*0.037*	*-0.050*	*-0.090*
Elasticity - Internal & External remittances	0.615	1.061	1.951	2.379	0.887	1.134	1.125
	(0.050)	(0.070)	(0.253)	(0.789)	(0.129)	(0.200)	(0.138)
Two-tailed test (intern&extern vs no remittances)	*-0.885*	*0.259*	*0.045*	*0.021*	*-0.029*	*-0.010*	*0.039*

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

2.7 Conclusions

Migrant's transfers can potentially play an important role in developing countries and it is important to understand how recipient households perceive and use them. The question on what remittances represent for the households is still a topic of debate. The way remittances are spent – in consumption or investment goods – is strictly determined by the context of the analysis. Some countries are able to promote a productive use of remittances better than others.

We contribute to the existing debate by investigating the impact of remittances on household expenditure behaviour in Senegal. The Migration and Remittances Household Survey conducted in 2009/10 allows us to identify four types of households: non-receiving; receiving remittances from internal migrants; recipients from external migrants; receiving from both internal and external migrants. It is important to consider households according to their remittance status because migrants' transfers could differ not only in their amount but also with respect to their origin and where transfers are originated can affect how they are perceived by the receiving households.

We had information on a wide range of expenditures which were aggregated in seven categories: food, consumption and durable goods, housing and land, investment, education, health and other types of expenditure. The empirical analysis is conducted using propensity score matching techniques and the average treatment effect (receiving remittances) is estimated matching treated households with those non-treated that are similar on the basis of their observable characteristics. This methodology performs comparatively well when a good instrument is not available even if it does not allow to address the issue of endogeneity. The idea is to use counterfactuals which are close enough to the treated units in term of their characteristics and therefore the probability of receiving the treatment is assumed to be random. Among the different types of remittances, the matching estimators show that external remittances have the stronger effect on the household expenditure behaviour; food, consumed and durables goods, education and investments are the budget shares in which the average difference between treated and non-treated households is significant. Those receiving external transfers spend on average less on food and more on durables, education and investment. These results give some signal of a productive use of remittances. We also

compare the propensity score matching estimates with the Working-Leser model framework which allows us to extend the analysis to the expenditure behaviour at the margin. We find similar results when we look at the average impact of remittances on the different categories of items; however in term of impact of remittances on marginal spending behaviour we cannot conclude for a strong difference in consumption behaviour among the different households remittance status in Senegal. This conclusion is suggested by the fact that the estimates of the interaction terms between log of expenditure and remittance status are insignificant. Based on the results on Table 2.11, it seems that in the decision on how to allocate expenditure, remittances are treated just as any other source of income. This finding does not support the view of remittances as a valve for the development but it does not mean that migrants' transfers cannot be used in a productive way. Poverty and disparities in income per capita among developing countries help explain why households use remittances for different purposes. This last argument is supported by Adams *et al.* (2008a) who explain why they find different results in Ghana and Guatemala: low income-countries perhaps value income from remittances just as wage income but it could be possible that in the long run - after the household is able to provide a minimum level of satisfaction in the basic commodities - the role and perception of remittances change. This suggests that remittances can play a role in the development process only if there is a common effort to ensure some minimum standard of living among the whole population. We believe that better quality of information and an environment (or institutions and local governments) which stimulates investment can result in a conscious and better use of transfers - for example, improving quality of education and incentive to school attendance; promote infrastructure, reduce uncertainty and create conditions for making investments productive. Remittances by themselves cannot be a tool for economic development and must be supported by other development strategies.

We are aware that more research has to be implemented to understand what can be done to make the use of remittances beneficial both for the receipt households and for the local society whenever they are not. Developing countries face different issues and they differ in characteristics; this explains why migrants' transfers are interpreted in different ways. A specific strategy for each situation needs to be found: remittances can promote development only if correctly perceived and used.

APPENDIX A

Table 2.1A: Logit regression for the remittance receipts – Marginal effects.

VARIABLES	Internal remittances	External remittances	Internal&External remittances
Household size	0.005**	0.017***	0.012***
	(0.002)	(0.002)	(0.001)
Prop of children (0 – 4)	0.379***	0.158	0.227***
	(0.108)	(0.116)	(0.087)
Prop of children (5 – 15)	0.324***	0.129	0.196***
	(0.087)	(0.090)	(0.069)
Prop of elderly	0.172	0.337**	0.236***
	(0.130)	(0.136)	(0.085)
Prop of women	0.237**	0.253***	0.317***
	(0.093)	(0.092)	(0.070)
Owning agriculture land	0.037	0.0390	0.038*
	(0.027)	(0.029)	(0.020)
HH head (=female)	0.652***	0.687***	0.424***
	(0.105)	(0.107)	(0.082)
Age of the HH head	0.0126***	0.007***	0.009***
	(0.002)	(0.002)	(0.001)
HHhead*age	-0.009***	-0.007***	-0.005***
	(0.001)	(0.001)	(0.001)
HH head with secondary educ	-0.006	0.104***	0.045
	(0.037)	(0.039)	(0.032)
HH head with tertiary educ	-0.090**	0.049	-0.062**
	(0.043)	(0.050)	(0.028)
Observations	1,275	1,430	1,130
Log-likelihood	-659.61	-807.46	-406.48

Table 2.2A: Multinomial Logit regression for the remittance receipts

VARIABLES	Marginal effects after mlogit			
	No remittances	Internal remittances	External remittances	Internal&External remittances
Household size	-0.017***	-0.000	0.013***	0.005***
	(0.002)	(0.001)	(0.002)	(0.001)
Prop of children (0-4)	-0.377***	0.226***	0.036	0.114**
	(0.110)	(0.076)	(0.094)	(0.053)
Prop of children (5 -15)	-0.288***	0.183***	0.018	0.086*
	(0.087)	(0.060)	(0.076)	(0.046)
Prop of elderly	-0.407**	0.049	0.228**	0.128**
	(0.162)	(0.096)	(0.109)	(0.055)
Prop of women	-0.386***	0.063	0.161**	0.161***
	(0.098)	(0.066)	(0.079)	(0.043)
Owning agricultural land	-0.058**	0.0162	0.013	0.028**
	(0.027)	(0.019)	(0.023)	(0.012)
HH head (=female)	-0.839***	0.291***	0.402***	0.146***
	(0.105)	(0.070)	(0.084)	(0.04)
Age of the HH head	-0.0136***	0.006***	0.003	0.003***
	(0.002)	(0.001)	(0.002)	(0.001)
HHhead*age	0.010***	-0.004***	-0.003**	-0.002***
	(0.001)	(0.001)	(0.001)	(0.000)
HH head with secondary education	-0.076**	-0.033	0.084**	0.025
	(0.036)	(0.025)	(0.033)	(0.019)
HH head with tertiary education	0.0218	-0.087***	0.099**	-0.034
	(0.052)	(0.029)	(0.049)	(0.021)
Rainfall level by districts (1990-2009)	0.002*	0.000	-0.000	-0.002***
	(0.001)	(0.000)	(0.001)	(0.000)
Observations	1,939	1,939	1,939	1,939
Wald Chi Squared		360.03		
Log pseudo likelihood		-2152.68		

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

CHAPTER III

REMITTANCES AND OCCUPATIONAL OUTCOMES OF THE HOUSEHOLD MEMBERS LEFT-BEHIND*

3.1 Introduction

Many empirical studies have underlined the interrelationship between migration and development. One stream of research in this area is focused on occupational choices, especially the possible entrepreneurial tendencies, of return migrants. Given the financial constraints in the country of origin, which hinder the development of entrepreneurial activities, remittances and repatriated savings are a way to finance new projects (Mesnard, 2004; Ilahi, 2002; Dustmann and Kirchkamp, 2002). Furthermore, compared to non-migrants, return migrants or those living in households with return migrants are more likely to be self-employed and, thus, help create employment opportunities in the home country's labour market with positive consequences for growth and development (Giulietti *et al.*, 2013; Demurger and Xu, 2011; Piracha and Vadean, 2010).

While there are a number of papers that look at remittances, return migration and occupational choice, the effect of remittances on the occupational choices of the non-migrant household members has received less attention.[28] Nevertheless, there are a number of ways in which migration and remittances could affect those remaining in the home country.[29] For instance, since remittances from migrants usually take place under conditions of asymmetric information, there could be a possible moral hazard problem

[28] A slightly related literature covers the impact of remittances on the labour market *participation* of those left behind (Kim, 2007; Funkhouser, 2006). Justino and Shemyakina (2010) conduct such an analysis for Tajikistan and find that adults in remittance receiving households are less likely to participate in the labour market and supply fewer working hours; the effect being stronger for men.

[29] For a review of the related literature, see Antman (2013).

*This paper is done in cooperation with Florin Vadean. 70 per cent of the work is done by myself. Florin Vadean performed the decomposition analysis and helped me with the interpretation of the results. I made the rest of the analysis.

in which the relative in the home country exerts minimal effort, which is not observable by the migrant (see Chami *et al.*, 2005). This could, in the extreme, mean that the relative remaining in the country of origin enjoys leisure at the expense of the migrant and chooses not to work at all. On the upside, remittances can be used by household members in entrepreneurial activities and, thus, generate wealth and employment, especially in the presence of credit constraints (see Woodruff and Zenteno, 2007).

Acosta (2007) examines the effect of either 'access to remittances' and 'living in a migrant household' on labour force participation, hours worked and occupational choice of those left behind. He uses a nationally representative household survey from El Salvador and implements an instrumental variable approach to correct for bias due to endogeneity of remittances and migration. He finds gender differences in the use of remittances across households: access to remittances produces a disincentive effect on participation and number of hours worked for women, but not for men. Regarding occupational choice, Acosta shows that remittances increase the probability to work on own-account among men, while recipient females are more likely to be microenterprise owners. Across gender the effect is much stronger in rural areas. The results suggest that international transfers can help boost business and overcome liquidity constraints, in particular in underdeveloped areas. The hypothesis that remittances create access to self-employment activities in the presence of lack of capital is supported, for example, by empirical findings for Pakistan (Adams, 1998), Thailand (Paulson and Townsend, 2004), Mexico (Woodruff and Zenteno, 2007), and the Philippines (Yang, 2008).

Given the different possible effects of remittances on the remaining household, it is important to understand their role on development through the occupational decisions of those left behind.[30] We analyse such an impact in Tajikistan, a country experiencing a significant outflow of temporary labour migration due to poor living conditions and lack of jobs. We use the 2007 Tajikistan Living Standards Survey (TLSS) and consider four possible occupational outcomes: a) not working, b) working on a household farm, c) working in a household business, and d) wage employment.

[30] Banerji and Newman (1993) argue that "there are several ways in which the dynamics of occupational choice influence the process of development. Most obvious among them is the effect on the distribution of income and wealth. Insofar as distribution can affect saving, investment, risk bearing, fertility and the composition of demand and production, there is a clear link with the economy's rate of growth and hence with development in its narrowest sense" (page 275).

Given that agriculture accounts for about 20 per cent of Tajikistan's GDP and employs over 60 per cent of the labour force (see European Training Foundation, 2010), we explicitly distinguish between working in either a household farm or non-farm business in order to determine whether access to remittances allows households to engage in riskier non-farm investments.

We find that for men remittances have a negative impact on working as wage employee. Moreover, after controlling for endogeneity, the positive effect of receiving remittances on not working disappears, while the effect on working in one's own household business becomes positive and significant. This reveals a link between remittances and household investments in job creating activities, with a potentially positive effect on economic development. For women, however, we find no significant impact of remittances on occupational outcomes. This is most probably due to the fact that women occupation outcomes in Tajikistan's society are mainly determined by culture and tradition. The argument is confirmed by a decomposition analysis, showing that the differences in predicted probabilities between men and women are mainly due to 'treatment' (i.e., belonging to the gender group) than to 'endowment' (i.e., gender differences in characteristics).

The remainder of the paper is organized as follows. Section 3.2 provides some background on the migration and labour market situation in Tajikistan. Section 3.3 presents the descriptive statistics while Section 3.4 describes the empirical approach. Results are discussed in Section 3.5 and the concluding remarks appear in the last section.

3.2 Labour market and migration in Tajikistan

Tajikistan is classified as one of the poorest countries in the world. Instability after the collapse of the Soviet Union contributed to the slowdown of the development process with a significant consequence on the standard of living. The 1992-1997 civil war compromised the poor physical infrastructure and destroyed much of human and social capitals of this already beleaguered economy.

Despite the economic reforms in the last decade that have allowed the country to achieve substantial welfare improvements,[31] poverty is still a threat for majority of Tajiks. The World Bank (2009) reports that 41 per cent of the population was living below the poverty line at the end of 2007. The most affected by poverty are the rural areas that host about 75 per cent of the population (World Bank, 2009). The lack of employment opportunities is a pressing issue in Tajikistan as the labour market has failed to respond to the rapid population growth. According to the official statistics, the labour force participation rate was 51.7 per cent (2,201,000 people) in 2007 and is much lower among females and in the urban areas (European Training Foundation 2010). The main sector of employment is agriculture whereas the industrial production is weak and concentrated in few regional centres.

Estimates of the unemployment level vary with respect to the source of data: according to the State Statistics Committee the unemployment rate was reasonably constant between 2000 and 2007 at 2.3 per cent, estimates on the basis of the Labour Force Survey give an unemployment level of 7.4 per cent in 2004, while estimates based on the 2007 Tajikistan Living Standard Survey reveal an unemployment rate of 9.5 per cent. By themselves, those numbers are not high but it is important to note that the figures are relatively low because of labour emigration and the high rate of inactivity in the labour market (about 48.3 per cent). Overall, the unemployment rate is much higher in urban than rural areas and women are more affected than men. Young people are the category suffering most from the lack of jobs and migration represents a relief/safety valve to this problem.

The migration trends in Tajikistan reflect the history of the country and one can identify different phases. The early 1990s were characterized by a refugee flow due to political instability and the civil war (1992-1997), which led to a significant change in the ethnic composition of the population. The census conducted in Tajikistan in 2000 revealed that between 1989 and 2000 the country became more Tajik, as their share in the population increased from 62.3 to 79.9 per cent, while the presence of other ethnic groups decreased substantially (Erlich, 2006). The most important outflow concerned the Russians as the civil war made it dangerous for them to stay and many of them

[31] The average monthly per capita income increased in real terms from 119 somoni (about USD 40) in 2003 to 150 somoni (about USD 43) in 2007.

returned to Russia or moved to other ex- Soviet Republics. Also, many ethnic Turkmen, Kyrgyz and Uzbek fled the country during the civil war and the majority of them did not return or reclassified themselves as ethnic Arabs or Tajiks.

The late 1990s and 2000s saw an increase in labour migration to an unprecedented scale. The International Labour Organisation (2010) reports that an estimated 500,000 to 800,000 Tajik nationals (or about 10 per cent of the total population) have left the country to work abroad, the majority (over 95 per cent) to Russia. Most migration flows are temporary/seasonal in the lower skilled and informal sectors in agriculture, construction, trade and communal services. Migrants are predominantly young men from rural areas, many of them with completed secondary or vocational education.[32] The majority of migrants are married, but they only seldom migrate with their family, as their wages are low and insufficient to meet family needs in the host country. Nevertheless, their incomes are sufficient for sustaining the family in Tajikistan, where the cost of living is significantly lower.

Migrants' remittances represent an important source of income for many households in Tajikistan. For a considerable number of Tajiks the income abroad is the only way to provide for the basic needs of their families. Twenty-four per cent of all household have at least one migrant abroad and rural and poorer locations have a higher share of households with migrants (27 per cent) (World Bank, 2009). The World Bank estimates, using TLSS 2007 data, that both rural and urban households in the poorest quintile derive respectively, 56 per cent and 79 per cent of their consumption through remittances (World Bank, 2009). Migration, therefore, can be seen as a survival strategy for dealing with poverty. According to the State Statistical Committee, only 30 per cent of households with at least one member abroad consider themselves poor compared to 65 per cent of the overall population (Olimova and Bosc, 2003). According to Riester (2012), remittances amounted to $2.5 billion in 2008 and represented 49.6 per cent of the country's GDP.

[32] In 2005, among those who travelled abroad to earn a living for the first time, 88 per cent were younger than 30 (International Organization for Migration, 2006).

3.3 Migration, remittances and the left behind

Migration can be an important source of development for many sending countries through its effects on education, health, entrepreneurship and reorganization of the local labour market. Many empirical studies find that the migration of family members affects on those left behind. On the one hand, remittances could act as compensation for poor economic performance (Chami *et al.*, 2005). On the other hand, remittances help to relax the household budget share and overcome the lack of credit in the origin country. International income can affect individual behaviour and may be the source to set up a business in the local economy.

As migration and the consequent remittances can be a way of alleviating poverty, at least in the recipient household, or overcoming financial difficulties for self-employment, especially in the presence of capital market imperfections, a number of papers have looked at occupational choice of return migrants (Mesnard, 2004; Ilahi, 2002; Dustmann and Kirchkamp, 2002). However, there is limited literature which looks at the occupational choices of those left behind. Some more recent studies compare the occupational choices of return migrants with the ones of non-migrants. They conclude for a tendency of return migrants to self-employment respect to those without the same experience (Demurger and Xu, 2011; Piracha and Vadean, 2010). Their analysis does not distinguish between non-migrants receiving and not receiving remittances.

Our approach differs from the existing literature which links entrepreneurship with temporary migration and focuses on the choices of migrants themselves upon return. Rather, we are interested in the occupational choices of non-migrants. A considerable number of studies examine how the labour supply of individuals left behind responds to migration looking in particular at participation and number of hours worked. The occupational choice decision of those left behind has not received much attention from the recent studies with few exceptions. Giulietti *et al.* (2013) explore the indirect effect of internal migration on entrepreneurship decision of individuals left behind in the case of rural China. In particular, they examine whether having current migrants or return migrants in the household affect the probability of self-employment of members left behind with no migration experience. They conclude that return migration promote self-employment among those members left behind whereas current

migration has a disincentive effect on the same activity for non-migrant members compared to individuals living in households where no one has migrated. Remittances are not enough to compensate for the penalty of the absence of a member. However, if return migration occurs household members benefit of the experience gained from the returnees to set-up a business.

Acosta (2007) attempts to examine the effect of international transfers on labour participation, hours worked and occupational choice of those left behind. He uses a nationally representative household survey from El Salvador and implements an instrumental variable approach to correct for the selectivity bias or endogeneity originated by the variable remittances. He finds gender differences in the use of remittances across households: access to remittances produces a disincentive effect on participation and number of hours worked for women. However, the negative impact on participation and hours worked disappears for the sample of men. Looking at the entrepreneur choice, Acosta shows that remittances increase the probability of self-employment among men while recipient females are more likely to be engaged in own microenterprise management. Across gender the effect is much stronger in rural areas. Those results suggest that international transfers can help boost business and overcome liquidity constraints especially in underdeveloped places. The hypothesis that remittances create access to new activities in presence of lack of capitals is supported by Woodruff and Zenteno (2007). They find that international income is positively associated with microenterprise investment in Mexico.

As mentioned earlier the indirect impact of out-migration on labour participation and hours worked for those left behind has been widely explored. For example, using a pseudo-panel data from a series of representative household surveys in Jamaica, Kim (2007) finds that remittances have a strong negative impact on labour participation but no effect on the weekly hours worked. His analysis covers the period 1995-2002 and a fixed effect approach is implemented. Kim concludes that individuals living in household receiving remittances have a higher reservation wage and they are less enthusiastic to join the labour market. In a similar study conducted in Nicaragua, Funkhouser (2006) concludes for a negative impact of international migration on labour force participation. He establishes that those households from which an emigrant left show a reduction in working members as well as working income than otherwise similar

households. However, also poverty declines in those household with international migrants. Funkhouser uses panel data from the LSMS in Nicaragua which covers the years 1998 and 2001. Neither Kim and Funkhouser's studies control for possible selection in the receipt of remittances and that could have biased their results.

Using a large household survey from Mexico, Amuedo-Dorantes and Pozo (2006) investigate the labour market impact of workers' remittances by type of employment, location and gender. They control for the possible endogeneity of remittances using the number of Western Union offices in a state as instrumental variable. They find different outcomes for men and women. Overall, the labour supply for men does not change for effect of the external inflow of income, though its composition by type of employment does. For men, they find a reduction of hours worked in the formal sector and an increase in the informal one both in rural and urban areas. Moreover, they find a reduction in self-employment activities in urban areas. For women, the overall labour supply declines for effect of remittances but only in the rural area. One explanation given for the male labour force outcomes is that individuals receiving remittances prefer moving to more flexible and informal jobs.

The question on how the labour supply responds to international transfers has also been explored in Tajikistan. Using household data from the 2003 Tajik Living Standards Measurement Survey, Justino and Shemyakina (2010) find that overall adults – aged 16 to 65 - from remittance-receiving households are less likely to participate in the labour market and they supply less hours; the negative effect is stronger for men than women. As previous studies, they control for the possible endogeneity carried by the variable remittances using a proxy for size of migrant network. Moreover, they consider the joint impact of remittances and living in conflict affected areas during the Tajik civil war. They find that the combination of remittances and conflict affected area has a negative and significant effect on the labour supply of men but for women the place of residence does not seem to affect their supply. Those results contradict previous studies (Amuedo-Dorantes and Pozo, 2006; Funkhouser, 2006) which conclude for female labour supply being more responsive to changes in international transfers. The explanation given for the low impact of female labour supply is that first, women support high cost to join the labour market in conflict areas and they prefer to remain employed even if remittances are received; second, women may be more risk averse and

as they prefer to diversify their sources of income. Therefore, even in presence of international transfers they do not leave the workforce.

Another study conducted in Tajikistan links how individual self-select themselves across three occupational choices - international migration, local non-agriculture and local agriculture activities - to the earnings from those activities. Using data from the 2007 Tajik Living Standards Measurement Survey, Atamanov and van den Berg (2011) implement the model developed by Bourguignon *et al.* (2007). Considering individuals aged 15-65 they find positive selection in migration against local-non agriculture activities and positive selection of non-agriculture activities against local agriculture activities. This means that the more capable individuals choose to migrate and the ones with the worse capabilities stay in poor paid agricultural activities.

There is a lack of studies on occupational choice of those left behind; local entrepreneurship is mostly examined with respect to return migration and how those left behind respond to emigration in term of their job preference has not received enough attention from the literature. We believe that the occupational choices of those left behind are crucial for the development of poor countries.

3.4 Data

We study the impact of remittances and migration on the individual's activity choice decision using cross-sectional data from the Tajikistan Living Standards Survey 2007 (henceforth TLSS 2007). The data has been collected in two stages from September to November 2007 involving the National Statistical Committee of Tajikistan, the World Bank and the United Nations Children's Fund. The survey, designed mainly to allow for a reliable assessment of poverty and living standards in Tajikistan, considers different aspects of individual and household characteristics and covers a wide range of topics such as migration, employment, income, expenditure, health and nutritional status, and agriculture. The goal of the survey was to stimulate the wider use of household data for the implementation of policies aimed to reduce poverty in a country in which a consistent part of the population is not able to meet its basic need (World Bank, 2009). The total sample, representative at the national level, contains 4,860 households.

The working population in Tajikistan (15 to 62 for men and 15 to 57 for women) consists of 4.2 million individuals though only half of them are part of the labour force, the other half being inactive (World Bank 2009). The low labour market participation in Tajikistan is captured by the survey data: about 50 per cent of the sampled adults are outside the labour force. Housewife is the category that dominates the non-labour market participant group (47 per cent) and further 26 per cent report to be students. The rest of the inactive individuals are either retired, discouraged in finding a job or working seasonally.

For the purpose of our study we restrict our sample to the working age adults, i.e., 15 to 62 for males and 15 to 57 for females. After dropping handicapped, housewives,[33] students,[34] individuals in retirement and military service as well as observations with missing values for the variables of interest, we end up with 9,366 individuals: 5,909 males and 3,457 females.

Under the hypothesis that remittances can affect the labour market decisions of those left behind, we consider four possible outcomes: not working; working on a household farm; working in a household business; and wage employment (i.e., working for a non-family business). The 'not working' category includes those who at the time of the survey were either unemployed, waiting for a recall by the employer, discouraged because of not finding a job, or waiting for a busy season. We consider separately those working in agriculture and any other type of business within the household because of the possibility of a different strategy behind the two categories: having access to

[33] Housewives represent 48 per cent of women in working age (4175 females). Table 3.1B, in the appendix B, shows that there is no difference in the proportion of housewives living or not in remittances receiving households. First we included housewives in the analysis. On the appendix B we present biprobit (Table 3.2B) and control function approach for the sample of women (Table 3.4B). We find a negative impact of remittances on the probability of being housewives; however, the other occupational outcomes are not affected by remittances. We decided to exclude housewives from the analysis, which may need a different investigation, and to focus on the other occupational choices in order to understand why remittances affect only men occupational choices and not women. For this purpose, we present on section 3.5.1 a decomposition analysis which aims to understand the different outcomes between men and women.

[34] Those individuals between the age 15-25 reporting to be students are 2502 and they are 15.6 per cent of the working age sample. Again, Table 3.1B shows no difference in the proportion of students living or not in remittance receiving households. Moreover, after controlling for individual and household characteristics we do not find any significant impact of remittances on students both for the sample of men and women. We run biprobit and control function approach estimations; results are reported on Tables 3.2B, 3.3B, 3.4B. Given the insignificant results we have decided to exclude students from the analysis.

remittances could allow households to take more risk and diversify into non-farm business.

The analysis is focused exclusively on international remittances, defined as monetary and in kind transfers received by the household from abroad during the past 12 months. The information on remittances is collected in two different sections of the questionnaire. The first section contains questions on household members being abroad at the time of survey, including the amount of remittances received from them only. The second includes questions about transfers received from all sources including relatives, friends and institutions based in or outside Tajikistan, but the amount of remittances is reported only for those received from abroad. (Amounts of internal remittances are not reported in the survey).

Descriptive statistics in Table 3.1 show that about 15 per cent of working age men (aged 15 to 62) and about 19 per cent working age women (15 to 57) live in households receiving remittances. The average amount of yearly remittances received by the receiving households is about TJS 2,835 (or USD 819) and TJS 3,022 (or USD 872) for men and women, respectively.[35]

A larger share of men living in remittance receiving households is secondary educated (+4 percentage points) but a smaller share is tertiary educated (-6 percentage points) compared to those living in non-receiving households. Better educated men are more likely to face better opportunities in the labour market in terms of jobs and wages and, therefore, their families are less dependent on remittances. As expected, a larger share of the men living in remittance receiving households is ethnic Tajik (86.6 vs. 77.7 per cent) and lives in rural areas (78.5 vs. 69.6 per cent). As discussed in Section 3.2, many Tajik nationals of other ethnicities fled the country during the 1990's civil war and never returned; most of them eventually lost all contacts with their former home country. On the other hand, in the aftermath of the civil war, ethnic Tajiks

[35] The average amount of annual remittances per household (including receiving and non-receiving households), estimated using TLSS 2007, is about USD 139. This average amount is significantly lower compared to a simple estimate based on the total amount of international remittances reported by the National Bank of Tajikistan for 2007 (USD 1.8 billion) and the total number of households reported by the 2010 census (1.2 million), giving an amount of yearly remittances received by the average Tajik household of about USD 1,500. This reveals that the amount of remittances in the TLSS 2007 is underreported by a factor of about 10.

predominantly from less developed rural areas started to migrate to Commonwealth of Independent States (CIS) in search of job opportunities.

Differences exist also with respect to region of origin. Those from the Region of Republican Subordination and Gorno-Badakhshan are strongly represented in the labour migrant group (Olimova and Bosc, 2003), which is why there is a higher share of individuals in remittance receiving households living in those regions (+5.7 and +12.9 percentage points, respectively). With respect to the household structure, those receiving remittances seem to have on average a lower number of children and elderly. This could be due to the fact that the more recent emigration cohorts consisted of relatively young men (below the age of 30), who are more likely to have fewer children and perhaps working age parents.

There is a very strong correlation between living in a remittance receiving household and having household members abroad: 76.9 per cent of men and 81.3 of women in remittance receiving households have a household member abroad, revealing that remittances are predominantly received from very close family members. Remittance receivers live in communities with on average 2.19 migrants, twice the number of emigrants in the community of non-receivers. Communities experiencing migration stimulate more remittances and it explains why households receiving remittances live in those communities having, on average, more migrants. Migration and remittances seem, therefore, to be an unevenly spread phenomenon, clustered at community level and with networks playing an important role.

Furthermore, we observe that a larger share of individuals living in a household receiving remittances are not working[36] (+8.3 percentage points for men and +3.6 percentage point for women) and a smaller share of them are wage employees (-11.8 percentage points for men and -8.4 percentage points for women), compared to those living in a non-receiving household. The larger share of men not working could be explained by the fact that some of them are temporary/circular migrants and mainly work abroad and enjoy leisure while at home. In the case of women, the extra income from abroad could possibly allow them to dedicate more time for parenting. Nevertheless, women seem also too often take up duties otherwise fulfilled by the

[36] Housewives and students are not included in the category of not working.

absent men, which could explain the larger share of women in remittance receiving households (+3.6 percentage points) working on a household farm.

Table 3.1: Descriptive Statistics – men, aged 15 to 62; women, aged 15 to 57

	Men			Women		
Living in a remittance receiving household	0.151			0.189		
Amount of yearly HH remittances – TJS	428.48 (USD 123.66)[1]			569.93 (USD 164.31)[1]		
Amount of yearly remittances (if>0) – TJS	2,835.24 (USD 819.27)[1]			3021.85 (USD 872.13)[1]		
	Living in remittance receiving household	Living in non-remittance receiving household	P-value	Living in remittance receiving household	Living in non-remittance receiving household	P-value
Age	35.856	35.324	0.227	33.206	33.219	0.978
Marital Status	0.703	0.757	0.001***	0.592	0.590	0.912
Education: primary or less	0.160	0.140	0.108	0.282	0.251	0.104
Education: secondary	0.712	0.672	0.019**	0.630	0.639	0.672
Education: tertiary	0.128	0.188	0.000***	0.087	0.109	0.099*
Ethnicity: Tajik	0.866	0.777	0.000***	0.790	0.764	0.158
Occupation: not working	0.267	0.184	0.000***	0.178	0.142	0.019**
Occupation: working on HH farm	0.119	0.104	0.204	0.202	0.166	0.027**
Occupation: working in HH business	0.235	0.213	0.137	0.224	0.212	0.521
Occupation: wage employment	0.380	0.498	0.000***	0.396	0.480	0.000***
Household size	7.533	7.417	0.297	6.986	7.260	0.034*
No. of children in the household	2.234	2.365	0.045	2.126	2.258	0.082
No. of elderly in the household	0.207	0.270	0.001***	0.282	0.270	0.605
Migrant household	0.769	0.021	0.000***	0.813	0.029	0.000***
No. of migrants in the household	1.060	0.025	0.000***	1.104	0.037	0.000***
Rural	0.785	0.696	0.000***	0.793	0.703	0.000***
Region: Dushambe	0.102	0.152	0.000***	0.106	0.144	0.011**
Region: Sughd	0.101	0.184	0.000***	0.113	0.168	0.001***
Region: Khatlon	0.269	0.320	0.002***	0.304	0.378	0.000***
Region: Reg. of Republican Subordination	0.289	0.232	0.000***	0.193	0.171	0.188
Region: Gorno-Badakhshan	0.240	0.111	0.000***	0.284	0.139	0.000***
No. of migrants in community	2.191	1.172	0.000***	2.288	1.268	0.000***
Observations	893	5,016		652	2,805	

Note: 1) Exchange rate as at 30 Dec 2007: 1 USD = 3.4649 TJP.

3.5 Empirical approach

We use a random utility model to assess the labour market decisions of individuals. We assume that an individual chooses from four mutually exclusive alternatives: not working, working on a household farm, working in a household business, and working as wage employee. The utility that individual n obtains from alternative j is given by:

$$U_{nj} = V(rem_n, x_n, \beta_j) + \varepsilon_{nj} \tag{3.1}$$

where V_{nj} is the utility that depends on observed factors (i.e., representative utility), rem_n stands for the amount of remittances received by the household of individual n, x_n is a vector of exogenous variables relating to individual, household and regional characteristics, β_j is a vector of unknown parameters and ε_{nj} is the disturbance term and captures unobserved factors that affect the utility.

Assuming that ε_{nj} is random, the probability that individual n chooses alternative j is:

$$\begin{aligned} P_{nj} &= \text{Prob}(U_{nj} > U_{ni}, \forall j \neq i) \\ &= \text{Prob}(V_{nj} + \varepsilon_{nj} > V_{ni} + \varepsilon_{ni}, \forall j \neq i) \\ &= \text{Prob}(\varepsilon_{ni} - \varepsilon_{nj} < V_{nj} - V_{ni}, \forall j \neq i) \end{aligned} \tag{3.2}$$

A simple way to look at the individual occupational choice is to regard each alternative as a separate decision. We have four discrete outcomes taking value 1 if the alternative j is chosen and zero otherwise. The analysis can then be conducted using a simple probit framework. That allows for a flexible way of dealing with endogeneity of either continuous or dichotomous covariates. In fact, the variable remittances received by a household (rem_{hj}) is likely to be endogenous. For example, less risk averse households are more likely to send migrants abroad who then send remittances home and the level of risk aversion is also likely to influence the decision to start a business or not. Consequently, the unobserved term ε_{nj} is not independent of rem_n as required for

standard estimation. The way we address the endogeneity problem depends on how we model remittances. First of all, we express remittances as a binary variable function of observed instruments and unobserved factors:

$$rem_n = W(z_n, x_n, \gamma) + \mu_n \tag{3.3}$$

where ε_{nj} (from equation 3.1) and μ_n are independent of z_n and x_n, but ε_{nj} and μ_n are correlated. The vector z_n contains a set of instruments that are correlated with rem_n but not enter directly the utility function (U_{nj}).

Under this setting, a simple solution for dealing with endogeneity is the use of the bivariate probit model. It considers two binary outcomes which are potentially related after conditioning on regressors. The correlation between the occupational choice j and living in a household receiving remittances is given by $\rho = \text{Cov}(\varepsilon_n, \mu_n)$ – the disturbances are assumed to be bivariate normally distributed. If $\rho = 0$ the model collapses to two standard probit equations and endogeneity is not an issue. We estimate four biprobit models which relate each occupational choice – equation (3.1) - to the household status with respect to remittances – equation (3.3).

An extension of the binomial setting is the multinomial probit estimation. Because the four occupational choices are mutually exclusive but not separate outcomes, the multinomial framework is more appropriate in this case. However, because remittances are an endogenous variable we need to use an estimation technique which corrects for it.

One solution for dealing with endogeneity in this non-linear setting is to apply the control function approach (see Train, 2009) which implies considering remittances as a continuous variable. Again, the amount of remittances is expressed as a function of observed instruments and unobserved factors and it is presented by equation (3.3). Following Petrin and Train (2010), ε_{nj} is decomposed into a part that can be explained by a general function of μ_n and a residual:

$$\varepsilon_{nj} = CF(\mu_n, \lambda) + \tilde{\varepsilon}_{nj} \tag{3.4}$$

where $CF(\mu_n, \lambda)$ denotes the control function with parameters λ. We specify the control function as linear in μ_n (i.e., $CF(\mu_n, \lambda) = \lambda\mu_n$), giving utility the following form:

$$U_{nj} = V(rem_n, x_n, \beta_j) + \lambda\mu_n + \tilde{\varepsilon}_{nj} \tag{3.5}$$

The choice probabilities are derived from the conditional distribution of the residual $\tilde{\varepsilon}_{nj}$. Denoting the conditional distribution of $\tilde{\varepsilon}_{nj}$ by $g(\tilde{\varepsilon}_{nj}|\mu_n)$ and the distribution of β_j by $f(\beta_j|\theta)$, the choice probability is:

$$\mathrm{P}_{nj} = \mathrm{Prob}(\mathrm{U}_{nj} > \mathrm{U}_{ni}, \forall\, j \neq i)$$

$$= \iint I(\mathrm{V}_{nj} + \lambda\mu_n + \tilde{\varepsilon}_{nj} > \mathrm{V}_{ni} + \lambda\mu_n + \tilde{\varepsilon}_{ni}, \forall j \neq i) g(\tilde{\varepsilon}_{nj}|\mu_n)\, f(\beta_j|\theta) d\tilde{\varepsilon}_{nj} d\beta_j \tag{3.6}$$

This is a standard choice model, with the control function entering as an extra explanatory variable. The functional argument of the integral, *I*, is the indicator function. The model is estimated in two steps. First, equation (3.3) is estimated by OLS with the endogenous rem_n variable as the dependent variable and with exogenous instruments (i.e., z_n and x_n) as explanatory variables. Using the estimated parameters $\hat{\gamma}$ from the OLS regression the residual is calculated as $\hat{\mu}_n = rem_n - W(z_n, x_n, \hat{\gamma})$. In the second step, the choice model is estimated using multinomial probit with $\hat{\mu}_n$ as an additional covariate.

We use two instruments (z_n) to identify the model: being an ethnic Tajik and the number of migrants aged 16 to 64 in the local community in 2004. Ethnic Tajiks dominate labour migration from Tajikistan and there is also a larger share of ethnic Tajiks in the population group living in remittance receiving households (see Erlich, 2006 and Table 1). On the other hand, as discussed in Section 3.2, individuals of other ethnic minorities (i.e., Russians, Tatars, Uzbeks, etc.) left the country as refugees during the 1990s civil war, often with their entire families and have never returned. Therefore, living in an ethnic Tajik household increases the likelihood of receiving remittances but should not affect household members occupational choice. The main reason for using

the second instrument is that migrant networks facilitate current migration by providing communities with information about opportunities in foreign labour markets and consequently have a positive effect on current remittance flows as well. Migration history and community migrant networks have been widely used as instrumental variables in other empirical studies as well (see Justino and Shemyakina, 2012; Demurger and Xu, 2011; Acosta, 2007).

It could be argued that the standard Ordinary Least Square estimator is not adequate to model remittances because 83 per cent of our sample lives in households which do not receive any transfer from abroad. It is true that the multivariate probit regression using simulated maximum likelihood *mvprobit* (see Cappellari and Jenkins, 2003) would have fit better our data however, we find it unstable. First of all, the number of replications is a key choice for mvprobit and the cost of increasing the number of replications is lengthening run time; second, the estimates are sensitive to the choice of the seed value: different seeds may lead to different parameter estimates. We justify the implementation of a control function approach, which implies the use of OLS in the first stage, with the fact that those zeroes do not come from unobservable or missing information, instead they are true zeroes and they represent the value of not receiving international remittances. We also compare the estimates of the control function approach with the ones generated by the biprobit model. Overall, we find stable results between the two different approaches.

As monetary variables in survey data collection are often underreported (see Meyer *et al,.* 2009 and Section 3.3), we first replace receiving remittances with having at least one household member abroad. We then replace the amount of remittances with the "number of household members who are migrants" ($nmig_n$) to check for the robustness of the results.[37] The empirical strategy is similar: first, we use a simple probit for each occupational outcomes and then we implement bivariate models to take into account the endogeneity of migration - which is modelled here as a discrete variable. Afterwards, we extend the bivariate framework to the multinomial setting implementing the multinomial probit model and the control function approach. Given the count nature of the $nmig_n$ variable - "number of household members a migrant" - we estimate

[37] A household sending more migrants abroad is likely to receive more remittances.

equation (3.3) by a generalised linear model (GLM). Using the parameters from the GLM estimation, we obtain the fitted values for the number of household members who are a migrant ($\widehat{nmig}_n$) and use them to calculate the deviance residual:

$$\hat{d}_n = \text{sgn}(nmig_n - \widehat{nmig}_n)\sqrt{2\left(nmig_n \log\left(\frac{nmig_n}{\widehat{nmig}_n}\right) - (nmig_n - \widehat{nmig}_n)\right)} \quad (3.7)$$

The choice model is then estimated using multinomial probit with $\hat{d}_n$ as an additional covariate.

In the result section we will discuss the estimations from the multinomial settings. Multinomial probit model and control function approach, both when the amount of remittances and number of migrants in the household, are considered. The estimations from the bivariate models are reported in the Appendix B and they are used just as robustness for our analysis (Tables 3.1B -.3.4B).

3.5.1 A further investigation: decomposition analysis

In addition, it is important to explore differences in occupational outcomes between gender groups. This can be done by computing the predicted probability differentials between the two groups and by assigning any difference to 'treatment' (i.e. difference due to coefficients) and 'endowment' (i.e. difference due to characteristics) components. The decomposition is relatively straightforward in the linear regression context (see Oaxaca, 1973). The approach was extended by Gomulka and Stern (1990) for binary dependent variables, Lichfield and Reilly (2009) for bivariate probit and Bauer and Sinning (2010) for tobit models. We follow the approach outlined by Gill (1989), which is applicable to multinomial logit models.

The sample average predicted probability for attaining occupation j in the case of men can be expressed as:

$$\frac{1}{N_M}\sum_{n=1}^{N_M}\frac{e^{\hat{\beta}_{jM} rem_{nM} x_{nM} \mu_{nM}}}{\sum_{k=NW,FF,FB,WA} e^{\hat{\beta}_{jM} rem_{nM} x_{nM} \mu_{nM}}} \quad (3.8)$$

where N_M denotes the sample size of men and $(\hat{\beta}_{jM})$ denote the coefficients obtained for the occupational outcome j from estimating the choice equation by multinomial logit for the men subsample.

The corresponding sample average predicted probability for attaining occupation j in the case of women is expressed as:

$$\frac{1}{N_F}\sum_{n=1}^{N_F}\frac{e^{\hat{\beta}_{jF}rem_{nF}x_{nF}\mu_{nF}}}{\sum_{k=NW,FF,FB,WA}e^{\hat{\beta}_{jF}rem_{nF}x_{nF}\mu_{nF}}} \tag{3.9}$$

where N_F denotes the sample size of women, k indicates the individual occupational choice: not working (*NW*); working on household farm (*FF*); working in the household business (*FB*); wage employment (*WE*) and $\hat{\beta}_{jF}$ denotes the coefficients obtained for the occupational outcome j from estimating the choice equation by multinomial logit for the women subsample.

Two counterfactual predicted probabilities are introduced for the decomposition analysis. The first provides the sample average predicted probability for men if subjected to women coefficients (i.e., the men's predicted probability of attaining occupation j if they would be women):

$$\frac{1}{N_M}\sum_{n=1}^{N_F}\frac{e^{\hat{\beta}_{jF}rem_{nM}x_{nM}\mu_{nM}}}{\sum_{k=NW,FF,FB,WA}e^{\hat{\beta}_{jF}rem_{nM}x_{nM}\mu_{nM}}} \tag{3.10}$$

The second counterfactual is constructed for the women subsample and provides the sample average predicted probability for women if confronted by the men coefficients (i.e. the women's predicted probability of attaining occupation j had they been men):

$$\frac{1}{N_F}\sum_{n=1}^{N_F}\frac{e^{\hat{\beta}_{jM}rem_{nF}x_{nF}\mu_{nF}}}{\sum_{k=NW,FF,FB,WA}e^{\hat{\beta}_{jM}rem_{nF}x_{nF}\mu_{nF}}} \tag{3.11}$$

These four measures allow the computation of the total difference in sample average predicted probabilities between the two population groups as: (3.8) – (3.9). Using men's

coefficients, the difference due to characteristics (i.e. endowment effect) can be computed by subtracting (3.11) from (3.8) and the difference due to coefficients (i.e. treatment effect) by subtracting (3.9) from (3.11). Alternatively, using women's coefficients, the endowment effect is (3.10) – (3.9) and the treatment effect is (3.8) – (3.10). The approach is subject to the standard index number problem and is sensitive to which coefficients are used to weight the characteristics. A desirable approach is thus to report both estimates and assess the degree of sensitivity.

3.6 Results

We run a probit and multinomial probit estimations as a baseline for the analysis of the effect of remittances on occupational outcomes[38]. The multinomial probit estimated marginal effects for men (Table 3.2) are in line with results from previous studies (Giulietti *et al.*, 2013; Mendola and Carletto, 2012; Demurger and Xu, 2011; Piracha and Vadean, 2010).[39] Everything else equal, we find a positive relationship between age and either working as a wage employee or in a household business. The ability of being self-employed increases with age because individuals accumulate both financial and human capital (see also Demurger and Xu, 2011). Conversely, not working is negatively related to age, confirming the fact that young adults in Tajikistan are the group mostly affected by lack of employment opportunities (see International Organization for Migration, 2006).

Education plays an important role in the occupational outcome as well. Ceteris paribus, tertiary education strongly increases the probability of working as a wage employee (26.2 percentage points) and decreases the probability of all other alternatives: working in a family business (-12.9 percentage points), not working (-9.1 percentage points), and working on a family farm (-4.2 percentage points). Secondary education has a similar effect on occupation, but to a smaller extent: it increases the

[38] The probit estimated marginal effects are reported in the Appendix B on Table 3.5B.

[39] As discussed on page 93 note 33, we ran estimations for women as well, but we do not find significant effect of remittances on their occupational outcomes except for housewives which we decide to exclude from the analysis in order to perform a decomposition analysis which investigates why remittances do not affect women occupational choices. Estimations are presented in the appendix B (Tables 3.2B and 3.4B). We do not discuss the women's estimates in the results section; we focus on the men outcomes. Moreover, on Table 3.9B, we just report the impact of remittances on the different women occupational choices excluding students and housewives. The other coefficients are omitted to save space and because they are not the main focus of the analysis.

probability of wage employment by 6.5 percentage points and decreases the probability of working on a household farm by 3.9 percentage points. These results are in line with findings from previous studies on occupational outcomes in developing countries. Piracha and Vadean (2010) find that better educated individuals in the Albanian labour market are less likely not to work or work on own account compared to being wage employees. Similarly, Mendola and Carletto (2012) find that years of education increase the probability of working as wage employee and decrease the probability of being self-employed. Ilahi (1999), using data from Pakistan, also finds that unskilled workers are often left outside the labor market and choose to engage in own account activities that do not require labor market skills, for example, small trade or workshops. Another possible explanation for these results is that employment in the family (farming or non-farming) business might be used by the less skilled as a safety net or as a flexible employment opportunity between migration trips.

Married men are more likely to work in a household business (+3.9 percentage points) or as wage employees (+4.3 percentage points) and less likely not to work (-9.6%), revealing that family duties are an important incentive for taking up employment (see also Giulietti *et al.*, 2013 and Demurger and Xu, 2011). Nevertheless, having sufficient income to support a family is often a prerequisite for marriage in the case of men. The presence of children in the household seems, however, to put further pressure on adult men to make a positive contribution to the family income. At mean, the presence of an additional child (aged 14 or less) in the household decreases the likelihood of men not to work (-1.1 percentage points) and increases the likelihood to work in the household non-farm business (+1.6 percentage points).

Working on a household farm seems not to be explained by marital status or household structure. A possible explanation for it is that the likelihood to choose agriculture activity depends rather on place of residence and access to agricultural land. In fact, living in a rural location increases the probability of working on a household farm by almost 7 percentage points.

The amount of remittances received by the household is our main covariate of interest. As in previous studies that have not controlled for the endogeneity of receiving remittances, we find a negative impact of the amount of remittances received by the household on labour market participation. Everything else equal, a one per cent increase

in remittances received by the household increases the probability of not working by 0.6 percentage points, while it decreases the probability of working as wage employee by 1.0 percentage points. As discussed in Section 3.4 this result might, however, be biased.

We apply biprobit and control function approach in order to correct for the endogeneity.[40] As described in Section 3.4, the two instruments selected to identify the model are: a) the number of migrants in the local community (i.e., as a proxy for migrants' networks) and b) a dummy for being ethnic Tajik. We are aware of the measurement issue which our migrant network variable may suffer. In fact, the network variable refers to the number of migrants at the community level until 2004 with may be contemporaneous to the number of migrants in 2007. Unfortunately, we were not able to identify a better network variable. We tested the validity of our instruments and we concluded that they are relevant and strong: the F-test of the joint significance of the instruments' coefficients from the remittances OLS estimation is 21.25 and thus higher than the Stock and Yogo (2005) 11.59 critical value, given one endogenous regressor, two instrumental variables, and a 15 per cent maximum size of a 5 per cent Wald test.

The first column of Table 3.3 reports the first step of the control function approach that is an OLS estimation of the log of the amount of remittances received. As expected from the results of the F-test, the two excluded instruments strongly determine the amount of transfers from abroad. Ceteris paribus, one more emigrant in the community migrant network in 2004 increases the amount of household remittances received at time of survey by 27.5 percentage points. This is consistent with the findings of Acosta (2007) who argues that the social network abroad facilitates the migration process and influences significantly the likelihood of being a recipient family. Moreover, as discussed earlier, ethnic Tajiks dominate Tajikistan's labour migration. It is, therefore, not surprising that, everything else equal, ethnic Tajiks live in households receiving on average 31.2 percentage points more remittances. The amount of transfers received is negatively affected by age (-10.3 percentage points) and having tertiary education (-35.3 percentage points). As better-educated individuals are likely to have similarly educated close relatives (i.e., spouse, children, and parents; see Bruze, 2011 and Holmlund *et al.*, 2011), members of these households would have better

[40] Marginal effects after biprobit are reported in the Appendix B on Table 3.8B.

employment opportunities in the Tajik labour market and be less dependent on labour migration and remittances.

The last four columns of Table 3.3 present the marginal effects after a multinomial probit of occupational choice with the OLS residuals from the first stage as additional covariate. The significant marginal effects for the OLS residual confirm the presence of an endogeneity bias. Therefore, the control function approach is to be preferred to the simple multinomial probit estimation. We find that the effect of remittances on not working disappears after controlling for endogeneity. On the other hand, the negative effect on working as wage employee becomes stronger, from -1.0 percentage points to -5.2 percentage points: ceteris paribus, a one per cent increase in the amount of remittances received decreases the probability of wage employment by -5.2 percentage points. Moreover, the impact on working in a household business becomes positive and significant: a one per cent increase in the amount of remittances received increases the likelihood of employment in the household business by 4.0 percentage points. So, contrary to the findings of Justino and Shemyakina (2012), we find no "dependency" effect of remittances on those left behind. Our results rather show that remittances received by households in Tajikistan, besides being used for covering daily needs, have an important contribution to generate employment opportunities for the family members left behind.

Table 3.2: Multinomial probit marginal effects – amount of remittances

	Not working	Working on HH farm	Working in HH business	Wage employment
Log of remittances	0.006***	0.002	0.003	-0.010***
	(0.002)	(0.002)	(0.002)	(0.003)
Age	-0.016***	-0.004	0.008*	0.013**
	(0.004)	(0.003)	(0.004)	(0.005)
Age squared x 100	0.015***	0.007*	-0.010*	-0.012*
	(0.005)	(0.003)	(0.006)	(0.006)
Married	-0.096***	0.014	0.039**	0.043*
	(0.020)	(0.012)	(0.019)	(0.023)
Education level: secondary	-0.008	-0.039***	-0.019	0.065***
	(0.017)	(0.015)	(0.018)	(0.021)
Education level: tertiary	-0.091***	-0.042***	-0.129***	0.262***
	(0.017)	(0.014)	(0.019)	(0.026)
Household size	0.010***	-0.001	-0.005	-0.004
	(0.003)	(0.003)	(0.003)	(0.005)
No. of children (<15)	-0.011*	0.006	0.016***	-0.011
	(0.006)	(0.004)	(0.006)	(0.007)
No. of elderly (>62)	0.002	0.014	-0.006	-0.009
	(0.010)	(0.010)	(0.013)	(0.014)
Rural location	-0.054**	0.069***	-0.030	0.015
	(0.025)	(0.019)	(0.028)	(0.032)
Regional controls	Yes	Yes	Yes	Yes
Observations		5,909		
Wald Chi-squared		732.23		
Log pseudo likelihood		-6750.63		

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3: Control function approach – amount of remittances

	OLS	Marginal effect after mprobit			
		Not working	Working on HH farm	Working in HH business	Wage employment
Log of remittances		-0.001	0.013	0.040**	-0.052**
		(0.018)	(0.016)	(0.019)	(0.021)
Age	-0.103***	-0.017***	-0.003	0.011**	0.009
	(0.025)	(0.004)	(0.003)	(0.005)	(0.006)
Age squared x 100	0.143***	0.016***	0.005	-0.015**	-0.006
	(0.031)	(0.005)	(0.004)	(0.006)	(0.007)
Married	0.010	-0.096***	0.015	0.040**	0.041*
	(0.121)	(0.020)	(0.012)	(0.019)	(0.023)
Education level: secondary	-0.030	-0.009	-0.038***	-0.017	0.064***
	(0.121)	(0.017)	(0.015)	(0.018)	(0.021)
Education level: tertiary	-0.353**	-0.092***	-0.038***	-0.117***	0.247***
	(0.152)	(0.018)	(0.014)	(0.021)	(0.027)
Household size	0.027	0.012***	-0.001	-0.008**	-0.002
	(0.026)	(0.004)	(0.003)	(0.004)	(0.005)
No. of children (<15)	-0.023	-0.014**	0.006	0.019***	-0.011
	(0.043)	(0.006)	(0.005)	(0.006)	(0.008)
No. of elderly (>62)	-0.292***	-0.001	0.017	0.004	-0.020
	(0.084)	(0.012)	(0.011)	(0.015)	(0.015)
Rural location	0.247	-0.052**	0.067***	-0.040	0.025
	(0.177)	(0.026)	(0.019)	(0.029)	(0.031)
Regional controls	Yes	Yes	Yes	Yes	Yes
No. of migrants in community	0.275***				
	(0.046)				
Ethnicity: Tajik	0.312***				
	(0.113)				
Constant	1.932***				
	(0.426)				
OLS residual		0.007	-0.012	-0.038**	0.043**
		(0.018)	(0.016)	(0.019)	(0.021)
Observations	5,909	5,909			
R-squared	0.065				
Wald Chi-squared		735.45			
Log pseudo likelihood		-6744.64			

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

In Section 3.4 we estimated that the amount of remittances received is underreported in the TLSS2007 by a factor of about 10. In order to check for the robustness of the results presented above, we follow an approach used by Justino and Shemyakina (2012) and replace the amount of remittances with the number of migrants in the household. The marginal effects of the baseline multinomial probit model in Table 3.4 are quite similar to the one with the amount of remittances as covariate of interest (Table 3.2).

Everything else equal, one more household migrant has a positive effect on not working and a negative effect on wage employment. Once again, after controlling for endogeneity (Table 3.5),[41] we find that the number of household members who are a migrant has no significant effect on labour market participation, but it increases the probability of working in a family business and decreases the probability of wage employment. Those results are consistent with the previous estimations using the amount of remittances as explanatory variable, with the exception that number of household migrants is positively related to working on own household farm as well. A possible explanation for it is that with respect to farming, absent household members eventually have to be replaced in their duties by the adults left behind.

Table 3.4: Multinomial probit marginal effects – number of migrants in household

	Not working	Working on HH farm	Working in HH business	Wage employment
No. of migrants in household	0.034***	0.019*	0.003	-0.056***
	(0.011)	(0.010)	(0.013)	(0.017)
Age	-0.016***	-0.004	0.007*	0.012**
	(0.004)	(0.003)	(0.004)	(0.005)
Age squared x 100	0.015***	0.006*	-0.010*	-0.011*
	(0.005)	(0.003)	(0.006)	(0.006)
Married	-0.097***	0.013	0.040**	0.044*
	(0.020)	(0.012)	(0.019)	(0.023)
Education level: secondary	-0.007	-0.038**	-0.019	0.064***
	(0.018)	(0.015)	(0.018)	(0.021)
Education level: tertiary	-0.090***	-0.042***	-0.129***	0.261***
	(0.017)	(0.014)	(0.019)	(0.026)
Household size	0.010***	-0.001	-0.005	-0.004
	(0.004)	(0.003)	(0.003)	(0.005)
No. of children (<15)	-0.011*	0.006	0.016***	-0.011
	(0.006)	(0.004)	(0.006)	(0.007)
No. of elderly (>62)	0.001	0.014	-0.007	-0.008
	(0.010)	(0.010)	(0.013)	(0.014)
Rural location	-0.055**	0.068***	-0.029	0.016
	(0.025)	(0.019)	(0.028)	(0.032)
Regional controls	Yes	Yes	Yes	Yes
Observations		5,909		
Wald Chi-squared		726.19		
Log pseudo likelihood		-6747.62		

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

[41] The number of migrants in the local community and the dummy for being ethnic Tajik are again valid and strong instruments. In the multinomial probit occupational choice estimation the combined F-test of the coefficients in all four occupation equations is 3.84 for the number of migrants in the community and 6.35 for being ethnic Tajik. The F-test of joint significance of the instruments coefficients from the number of migrants GLM estimation is 57.18 and thus higher than the Stock and Yogo (2005) critical value.

Table 3.5: Control function approach – number of migrants in household

	GLM	Marginal effect after mprobit			
		Not working	Working on HH farm	Working in HH business	Wage employment
No. of migrants in household		0.016	0.088**	0.094**	-0.198***
		(0.041)	(0.039)	(0.045)	(0.061)
Age	-0.110***	-0.017***	-0.002	0.010**	0.009
	(0.019)	(0.004)	(0.003)	(0.004)	(0.005)
Age squared x 100	0.154***	0.016***	0.003	-0.013**	-0.006
	(0.023)	(0.005)	(0.004)	(0.006)	(0.007)
Married	0.030	-0.097***	0.013	0.038**	0.045*
	(0.132)	(0.020)	(0.012)	(0.019)	(0.023)
Education level: secondary	-0.121	-0.008	-0.037**	-0.017	0.062***
	(0.092)	(0.018)	(0.015)	(0.018)	(0.021)
Education level: tertiary	-0.479***	-0.091***	-0.036**	-0.123***	0.250***
	(0.148)	(0.018)	(0.015)	(0.020)	(0.027)
Household size	0.045	0.010***	-0.002	-0.006*	-0.002
	(0.027)	(0.004)	(0.003)	(0.003)	(0.005)
No. of children (<15)	-0.036	-0.011*	0.006	0.016***	-0.012
	(0.045)	(0.006)	(0.004)	(0.006)	(0.007)
No. of elderly (>62)	-0.196**	0.001	0.016	-0.004	-0.013
	(0.096)	(0.011)	(0.010)	(0.013)	(0.014)
Rural location	0.382*	-0.054**	0.065***	-0.037	0.025
	(0.218)	(0.026)	(0.020)	(0.028)	(0.032)
Regional controls	Yes	Yes	Yes	Yes	Yes
No. of migrants in community	0.208***				
	(0.027)				
Ethnicity: Tajik	0.090				
	(0.162)				
Constant	-0.744*				
	(0.404)				
GLM deviance residual		0.014	-0.048*	-0.060**	0.094**
		(0.027)	(0.026)	(0.029)	(0.040)
Observations	5,909	5,909			
Wald Chi-squared		761.63			
Log pseudo likelihood	-2863.63	-6739.95			

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.6 summarizes the effect of remittances and migrants in the household on the occupational choice of men using the different estimation techniques discussed above. We find consistent results across the different methods.

Table 3.6: Summary of remittances and migration effects on individual occupational choice

Variable	Model	Not working	Working on HH farm	Working in HH business	Wage employme
Access to remittances	Probit	0.042**	0.009	0.015	-0.078**
	Biprobit	-0.045	0.200**	0.178**	-0.344**
Amount of remittances	Mprobit	0.006***	0.002	0.003	-0.010**
	Control function approach	-0.001	0.013	0.040**	-0.052**
Migrants	Probit	0.042**	0.015	0.000	-0.066**
	Biprobit	-0.045	0.160*	0.199**	-0.366**
Number of migrants	Mprobit	0.034***	0.019*	0.003	-0.056**
	Control function approach	0.016	0.088**	0.094**	-0.198**

The difference in predicted probabilities of occupational outcomes between men and women (Table 3.7) show that men are more likely not to work (+6.9 percentage points) or be wage employees (+1.5 percentage points) and less likely to work on a household farm (-7.9 percentage points). These differences are almost certainly the result of men being predominately from rural areas who are more likely to be engaged in international labour migration or 'preparing' for migration.[42] The women left behind, on the other hand, have to take over duties of the absent men.

The decomposition analysis reveals that gender differentials with respect to characteristics are mostly unimportant and observed gender occupational outcome

[42] The government of Tajikistan is using the export of workforce as a policy for easing labour market constraints. However, since most of the migration is to Russia, knowledge of Russian is key to labour market success while abroad (International Federation for Human Rights, 2011). The government, together with some multilateral organisations has established training centres that teach Russian language as well as labour market rules and regulations migrants need to follow. Potential migrants who attend these courses are, however, less able to fulfil their domestic obligations.

differences are mostly due to the 'treatment' effect. The gap is unlikely to change much in the near future, as these factors are strongly determined by culture and tradition. As argued by Litchfield and Reilly (2009), these factors tend to evolve in most countries at a "glacial pace". The only area where a targeted policy for the improvement of girls schooling could eventually make a difference is with regard to wage employment, as the gender gap is about 70 per cent explained by 'endowment'. Men seems better educated than women. Our data reveals that men with secondary education are around 67 per cent and those with tertiary education almost 18 per cent; women are less educated with 63 per cent of them having secondary education and only 10 per cent with tertiary education. Encouraging education for women could help reduce differences in characteristics between men and women and in the long run culture and tradition could be orientated to a more active role in the society. We believe that education is an important tool to improve women participation in the labour market.

Table 3.7: Decomposition of differences in predicted probabilities of occupation choice between men and women

	Predicted probabilities		Counterfactuals		Total difference	Endowment effect	Treatment effect	Endowment effect	Treatment effect
	men coefficients; men characteristics	women coefficients; women characteristics	women coefficients; men characteristics	men coefficients; women characteristics		men coefficients		women coefficients	
	Eqn. (3.8)	Eqn. (3.9)	Eqn. (3.10)	Eqn. (3.11)	(3.8) - (3.9)	(3.8) - (3.11)	(3.11) - (3.9)	(3.10) - (3.9)	(3.8) - (3.10)
Occupation: not working	0.178	0.109	0.093	0.213	0.069	-0.035	0.104	-0.017	0.086
Occupation: working on HH farm	0.118	0.196	0.196	0.118	-0.079	-0.001	-0.078	-0.001	-0.078
Occupation: working in HH business	0.202	0.207	0.214	0.199	-0.005	0.003	-0.008	0.006	-0.011
Occupation: wage employment	0.502	0.487	0.498	0.470	0.015	0.032	-0.017	0.011	0.004

Note: Predicted probabilities based on control function approach with log of remittances as covariate.

3.7 Conclusions

The aim of this paper was to explore the impact of remittances on the occupational outcomes of those left-behind. In particular, the economic activity of non-migrant household members could be positively affected if remittances are seen as an investment opportunity in the presence of credit constraint; but it could have a detrimental effect as well if the remaining relatives consider this a simple non-labour income, hence causing them to substitute work for leisure.

We assessed the role of remittances on the labour market outcome in Tajikistan using the Living Standards Survey 2007. We implemented a control function approach to address the issue of endogeneity of receiving remittances and found that the amount of remittances received increases the probability for men to be employed in a household business and decreases the probability of working as wage employees, while it has no effect on the occupational outcomes of women. These results withstand a robustness check, with the amount of remittances being replaced by the number of (potential) remitters.

A decomposition analysis reveals that the differences in gender occupational outcomes are mainly due to 'treatment' (i.e., belonging to the gender group) than to 'endowment' (i.e., gender differences in characteristics) and are, therefore, most probably determined by culture and tradition. Nevertheless, as about 70 per cent of the gender gap in wage employment is explained by 'endowment', a targeted policy for the improvement of girls schooling could eventually increase the employment level of future generations of Tajik women.

Migration and remittances can help the development process of local economies. However, they cannot be the only solution for financing new activities. As is often argued in the literature (see Catrinescu *et al,*. 2009), remittances can play an important role in development only if policymakers succeed removing constraints, such as political instability, corruption, lack of business regulation, financial constraints (access and cost of finance) and lack of good infrastructure.

APPENDIX B

Table 3.1B: Descriptive Statistics – housewives and students

	Men			Women		
Living in a remittance receiving household	0.157			0.187		
	Living in remittance receiving household	Living in non-remittance receiving household	P-value	Living in remittance receiving household	Living in non-remittance receiving household	P-value
Occupation: housewife				0.483	0.480	0.810
Occupation: student (age 15 – 26)	0.211	0.195	0.205	0.113	0.121	0.361
Observations	1,136	6,244		1,622	7,056	

Table 3.2B: Biprobit Marginal effects - effect of remittances on student and housewife choices.

	Marginal effects after biprobit				
	Men		Women		
	Remittances	In education	Remittances	Housewife	In education
Remittances (dummy)		-0.002		-0.305***	0.015
		(0.008)		(0.082)	(0.023)
Age	-0.008***	-0.009*	-0.004	0.011**	-0.006***
	(0.003)	(0.005)	(0.003)	(0.004)	(0.002)
Age squared x 100	0.012***	0.009	0.007*	-0.018***	0.007***
	(0.004)	(0.006)	(0.004)	(0.006)	(0.002)
Married	-0.006	-0.006	0.003	0.298***	-0.011***
	(0.016)	(0.004)	(0.011)	(0.018)	(0.003)
Education level:	0.003	0.003	-0.020*	-0.028*	0.002**
secondary	(0.013)	(0.002)	(0.011)	(0.015)	(0.001)
	-0.043***	-0.002	-0.038*	-0.296***	0.006
Education level:	(0.016)	(0.002)	(0.019)	(0.024)	(0.005)
tertiary	0.002	-0.000	-0.005	0.007*	-0.000
	(0.003)	(0.000)	(0.004)	(0.004)	(0.000)
Household size	-0.004	-0.000	0.006	-0.008	-0.000
	(0.006)	(0.001)	(0.006)	(0.006)	(0.000)
No. of children	-0.040***	-0.000	-0.020	-0.001	-0.001
	(0.013)	(0.001)	(0.013)	(0.013)	(0.001)
No. of elderly	0.031	-0.009*	0.062***	-0.015	-0.006**
	(0.023)	(0.005)	(0.022)	(0.035)	(0.003)
rural	-0.008***	-0.002	-0.004	-0.305***	0.015
	(0.003)	(0.008)	(0.003)	(0.082)	(0.023)
Regional Controls	Yes	Yes	Yes	Yes	Yes
COMmignet04	0.030***		0.033***		
	(0.004)		(0.005)		
Ethnicity: Tajik	0.046***		-0.009		
	(0.015)		(0.022)		
Observations	7,368			8,675	
rho		0.040		0.549***	-0.147
Wald Chi-squared		1663.66		1235.40	1637.37
Log pseudo likelihood		-4395.59		-9382.99	-5498.91

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.3B: Control function approach including education (men) – amount of remittances

	OLS	Marginal effect after mprobit				
		Not working	Working on HH farm	Working in HH business	Wage employment	Student
Log of remittances		0.002	0.011	0.033**	-0.048**	0.000
		(0.018)	(0.015)	(0.017)	(0.019)	(0.001)
Age	-0.074***	-0.012***	-0.003	0.011**	0.015***	-0.010***
	(0.023)	(0.004)	(0.002)	(0.004)	(0.005)	(0.003)
Age squared x 100	0.109***	0.010**	0.005	-0.014**	-0.012**	0.010**
	(0.029)	(0.005)	(0.003)	(0.005)	(0.006)	(0.004)
Married	-0.0127	-0.101***	0.014	0.044**	0.049**	-0.006*
	(0.116)	(0.019)	(0.012)	(0.019)	(0.022)	(0.003)
Education level: secondary	0.0379	0.006	-0.040***	-0.026	0.056***	0.003**
	(0.102)	(0.018)	(0.014)	(0.017)	(0.019)	(0.001)
Education level: tertiary	-0.287**	-0.088***	-0.039***	-0.116***	0.247***	-0.002
	(0.131)	(0.020)	(0.014)	(0.019)	(0.026)	(0.002)
Household size	0.012	0.012***	-0.001	-0.007**	-0.003	-0.000
	(0.025)	(0.003)	(0.002)	(0.003)	(0.004)	(0.000)
No. of children (<15)	-0.025	-0.014**	0.007	0.018***	-0.009	-0.000
	(0.041)	(0.006)	(0.004)	(0.005)	(0.007)	(0.000)
No. of elderly (>62)	-0.302***	-0.001	0.017	0.002	-0.0185	0.000
	(0.082)	(0.013)	(0.011)	(0.014)	(0.014)	(0.001)
Rural location	0.271	-0.052*	0.069***	-0.035	0.030	-0.011**
	(0.174)	(0.027)	(0.019)	(0.028)	(0.030)	(0.004)
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes
No. of migrants in community	0.280***					
	(0.043)					
Ethnicity: Tajik	0.331***					
	(0.115)					
Constant	1.394***					
	(0.392)					
OLS residual		0.004	-0.010	-0.031*	0.039**	-0.000
		(0.018)	(0.015)	(0.017)	(0.019)	(0.001)
Observations	7,368			7,368		
R-squared	0.061					
Wald Chi-squared	2614.99					
Log pseudo likelihood	8194.78					

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.4B: Table 3.3B: Control function approach including education and housewife (women) – amount of remittances

	OLS	Marginal effect after mprobit					
		Not working	Working on HH farm	Working in HH business	Wage employment	Student	Housewife
Log of remittances		0.011	0.013	0.017	0.008	0.000	-0.051**
		(0.007)	(0.013)	(0.013)	(0.017)	(0.001)	(0.020)
Age	-0.033	-0.003*	0.001	0.012***	0.023***	-0.005***	-0.027***
	(0.021)	(0.002)	(0.002)	(0.002)	(0.003)	(0.001)	(0.004)
Age squared x 100	0.052*	0.002	-0.001	-0.013***	-0.025***	0.006***	0.030***
	(0.030)	(0.003)	(0.002)	(0.003)	(0.004)	(0.001)	(0.006)
Married	0.005	-0.059***	-0.024***	-0.045***	-0.160***	-0.008***	0.298***
	(0.081)	(0.008)	(0.008)	(0.009)	(0.014)	(0.001)	(0.015)
Level of education: secondary	-0.125	0.010	-0.008	-0.002	0.052***	0.002**	-0.052***
	(0.086)	(0.006)	(0.008)	(0.010)	(0.012)	(0.000)	(0.015)
Level of education: tertiary	-0.247	-0.016	-0.012	-0.052***	0.467***	0.0037	-0.390***
	(0.153)	(0.010)	(0.016)	(0.013)	(0.031)	(0.003)	(0.024)
Household size	-0.040	0.005***	0.002	-0.003	-0.003	-0.000	-0.001
	(0.031)	(0.001)	(0.002)	(0.002)	(0.003)	(0.000)	(0.004)
No. of children (<15)	0.049	-0.007**	-0.001	0.006*	-0.000	-0.000	0.003
	(0.047)	(0.002)	(0.003)	(0.003)	(0.005)	(0.000)	(0.006)
No. of elderly (>62)	-0.177*	-0.004	0.005	-0.005	0.002	-0.000	0.002
	(0.094)	(0.006)	(0.007)	(0.008)	(0.011)	(0.000)	(0.013)
Rural location	0.510***	-0.037**	0.057***	-0.009	0.028	-0.006**	-0.031
	(0.164)	(0.016)	(0.018)	(0.018)	(0.025)	(0.002)	(0.037)
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of migrants in the community	0.280***						
	(0.046)						
Ethnicity: Tajik	0.078						
	(0.145)						
Constant	1.382***						
	(0.393)						
OLS residuals		-0.012*	-0.011	-0.019	-0.010	-0.000	0.053**
		(0.007)	(0.013)	(0.013)	(0.017)	(0.001)	(0.021)
Observations	8,675	8,675					
R-squared	0.044						
Wald Chi-squared	3931.09						
Log pseudolikelihood	-10084.12						

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.5B: Probit marginal effects (men) – remittances as dummy variable

	Not working	Working on HH farm	Working in HH business	Wage employment
Remittances	0.042**	0.009	0.015	-0.078***
	(0.017)	(0.014)	(0.017)	(0.022)
Age	-0.015***	-0.003	0.008**	0.014***
	(0.003)	(0.002)	(0.004)	(0.005)
Age squared x 100	0.014***	0.0055*	-0.011**	-0.013**
	(0.004)	(0.003)	(0.005)	(0.006)
Married	-0.093***	0.017	0.046**	0.051**
	(0.019)	(0.011)	(0.018)	(0.023)
Education level: secondary	-0.0052	-0.036***	-0.014	0.063***
	(0.017)	(0.014)	(0.017)	(0.021)
Education level: tertiary	-0.081***	-0.040***	-0.118***	0.261***
	(0.017)	(0.013)	(0.018)	(0.026)
Household size	0.009***	-0.000	-0.004	-0.003
	(0.003)	(0.002)	(0.003)	(0.004)
No. of children (<15)	-0.011**	0.005	0.014***	-0.011
	(0.005)	(0.004)	(0.005)	(0.007)
No. of elderly (>62)	0.0012	0.012	-0.006	-0.010
	(0.010)	(0.009)	(0.012)	(0.014)
Rural location	-0.056**	0.063***	-0.032	0.006
	(0.024)	(0.018)	(0.026)	(0.031)
Regional controls	Yes	Yes	Yes	Yes
Observations	5,909	5,909	5,909	5,909
Wald Chi-squared	337.15	113.09	141.01	324.27
Log pseudo likelihood	-2605.15	-1878.99	-2967.20	-3850.82

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.6B: Biprobit marginal effects (men) – remittances as dummy variable

		Marginal effect after biprobit			
	Remittances	Not working	Working on HH farm	Working in HH business	Wage employment
Remittances (dummy)		-0.045	0.200**	0.178**	-0.344***
		(0.092)	(0.080)	(0.083)	(0.091)
Age	-0.011***	-0.016***	-0.001	0.010***	0.008*
	(0.029)	(0.003)	(0.003)	(0.004)	(0.004)
Age squared x 100	0.016***	0.015***	0.003	-0.014***	-0.006
	(0.003)	(0.005)	(0.003)	(0.006)	(0.005)
Married	-0.032	-0.083***	0.021	0.046**	0.044**
	(0.158)	(0.016)	(0.014)	(0.019)	(0.020)
Education level: secondary	-0.065	-0.008	-0.037***	-0.013	0.054***
	(0.014)	(0.016)	(0.014)	(0.016)	(0.019)
Education level: tertiary	-0.541***	-0.091***	-0.042**	-0.124***	0.221***
	(0.020)	(0.022)	(0.018)	(0.024)	(0.029)
Household size	0.004	0.010***	-0.001	-0.005*	-0.001
	(0.003)	(0.003)	(0.003)	(0.014)	(0.004)
No. of children (<15)	-0.004	-0.011*	0.006	0.014***	-0.011*
	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)
No. of elderly (>62)	-0.039***	-0.001	0.019*	-0.001	-0.017
	(0.012)	(0.011)	(0.010)	(0.012)	(0.012)
Rural location	0.030	-0.049**	0.076***	-0.035	0.013
	(0.025)	(0.023)	(0.026)	(0.025)	(0.027)
Regional controls	Yes	Yes	Yes	Yes	Yes
No. of migrants in community	0.0291***				
	(0.004)				
Ethnicity: Tajik	0.049***				
	(0.017)				
Observations			5,909		
rho		0.200	-0.613**	-0.335*	0.471**
Wald Chi-squared		566.48	298.33	345.20	682.78
Log pseudo likelihood		-4925.25	-4195.87	-5285.19	-6166.81

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level. *** p<0.01, ** p<0.05, * p<0.1

Table 3.7B: Probit marginal effects (men) – migrants as dummy variable

	Not working	Working on HH farm	Working in HH business	Wage employment
Migrants	0.042**	0.015	0.000	-0.066***
	(0.017)	(0.017)	(0.017)	(0.025)
Age	-0.015***	-0.003	0.008**	0.014***
	(0.003)	(0.002)	(0.004)	(0.005)
Age squared x 100	0.013***	0.005*	-0.011**	-0.013**
	(0.004)	(0.003)	(0.005)	(0.006)
Married	-0.093***	0.017	0.046**	0.051**
	(0.019)	(0.011)	(0.018)	(0.023)
Education level: secondary	-0.004	-0.036***	-0.014	0.062***
	(0.017)	(0.014)	(0.017)	(0.021)
Education level: tertiary	-0.081***	-0.039***	-0.119***	0.261***
	(0.017)	(0.013)	(0.018)	(0.026)
Household size	0.009***	-0.000	-0.004	-0.003
	(0.003)	(0.002)	(0.003)	(0.004)
No. of children (<15)	-0.011**	0.005	0.0146***	-0.011
	(0.005)	(0.004)	(0.005)	(0.007)
No. of elderly (>62)	0.000	0.012	-0.007	-0.008
	(0.010)	(0.009)	(0.012)	(0.014)
Rural location	-0.057**	0.062***	-0.031	0.007
	(0.024)	(0.018)	(0.026)	(0.031)
Regional controls	Yes	Yes	Yes	Yes
Observations	5,909	5,909	5,909	5,909
Wald Chi-squared	371.32	113.98	138.34	312.89
Log pseudo likelihood	-2605.41	-1878.36	-2967.74	-3853.70

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.8B: Biprobit marginal effects (men) – Migrants as dummy variable

	Marginal effect after biprobit				
	Migrants	Not working	Working on HH farm	Working in HH business	Wage employment
Migrants (dummy)		-0.045	0.16*	0.199**	-0.366***
		(0.088)	(0.088)	(0.084)	(0.091)
Age	-0.012***	-0.016***	-0.001	0.011***	0.007
	(0.025)	(0.003)	(0.003)	(0.004)	(0.004)
Age squared x 100	0.017***	0.015***	0.003	-0.014***	-0.005
	(0.003)	(0.004)	(0.003)	(0.005)	(0.006)
Married	-0.009	-0.084***	0.021	0.047**	0.041**
	(0.154)	(0.016)	(0.014)	(0.019)	(0.021)
Education level: secondary	-0.017	-0.005	-0.035**	-0.011	0.048**
	(0.012)	(0.016)	(0.014)	(0.016)	(0.019)
Education level: tertiary	-0.059***	-0.092***	-0.042**	-0.122***	0.217***
	(0.018)	(0.022)	(0.019)	(0.024)	(0.03)
Household size	0.006*	0.010***	-0.001	-0.005*	-0.0008
	(0.003)	(0.003)	(0.002)	(0.003)	(0.004)
No. of children (<15)	-0.006	-0.011**	0.006	0.015***	-0.011*
	(0.005)	(0.005)	(0.004)	(0.005)	(0.006)
No. of elderly (>62)	-0.024**	-0.001	0.016*	-0.003	-0.013
	(0.011)	(0.010)	(0.010)	(0.012)	(0.013)
Rural location	0.030	-0.048**	0.074***	-0.038	0.020
	(0.025)	(0.024)	(0.026)	(0.025)	(0.028)
Regional controls	Yes	Yes	Yes	Yes	Yes
No. of migrants in community	0.028***				
	(0.004)				
Ethnicity: Tajik	0.023				
	(0.016)				
Observations			5,909		
rho		0.199	-0.475*	-0.406**	0.530**
Wald Chi-squared		586.53	331.55	382.13	760.95
Log pseudo likelihood		-4735.09	-4005.84	-5094.20	-5978.16

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level.
*** p<0.01, ** p<0.05, * p<0.1

Table 3.9B: Summary of remittance and migration effects on women occupational choice

Variable	Technique	Not working	Working on HH farm	Working in HH business	Wage employment
Access to remittances	Probit	0.003	0.033	-0.004	-0.034
	Biprobit	0.097	0.114	0.052	-0.242
Amount of remittances	Mprobit	0.0003	0.005	-0.001	-0.0037
	Control function approch	0.012	0.009	0.008	-0.030
Migrant in the household	Probit	-0.000	0.024	-0.028	0.005
	Biprobit	0.181*	0.314***	0.085	-0.376***
Number of migrants	Mprobit	0.004	0.014	-0.020	0.001
	Control function approach	0.045	0.050	0.023	-0.110*

Robust standard errors in parentheses, adjusted for 267 clusters at panel sampling unit level. *** p<0.01, ** p<0.05, * p<0.1.The other controls are omitted from the table to conserve space and also because they are not the main interest in this analysis.

CHAPTER IV

REMITTANCES AND RETURN MIGRATION

4.1 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 increased by approximately 6 per cent to $325 billion in 2010, returning to the level of 2008. These transfers of income are expected to increase further in the coming years.[43] Furthermore, the World Bank underlines that the volume of these private transfers could possibly be at least 50 per cent 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.[44] 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.

[43] The World Bank (2010).

[44] 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.

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 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, 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.[45] 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 (see Lu, 1999) and, as discussed in Castaldo *et al.*, (2005), in the context of intention to migrate, intentions may evolve if preferences and personal circumstances change. However, if migrants have actually returned to the home country, then it is reasonable to argue that their remittances while in the destination country were based on their 'true' intentions, at that time, to return. 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 repeated migration (circular migrants) – affect the remittance behaviour of return-migrants, while living abroad. Since in our setup the return is actually realised,

[45] See Rapoport and Docquier (2006) for an excellent review of the theoretical literature regarding the motivations for remittances.

we argue that the remittance behaviour captured in our analysis more closely relates not only to the characteristics of the migrants but also its interaction with different forms of migration. In addition, we highlight differences in remitting behaviour by type of return: 'decided' or 'compelled'. Migrants who decided or chose 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 data set collected in 2006 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 healthy remittance flows,[46] 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.

Our strategy consists in separating the probability and level of remittances. Our results show that differences in remittances across 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. By contrast, time spent abroad does not affect the decision to remit but does exert a positive effect on the level of remittances. Also, entering illegally in the host country positively affect the probability and level of remittances. In regards to the type of return, we find that some factors, e.g., having children before migration and form of entry (legal or illegal) affect decided and compelled returnees in different ways. We provide some intuition for our results.

The remainder of the paper is organized as follows. Section 4.2 summarizes how migration has evolved in the Maghreb region. Section 4.3 provides a description of the

[46] 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).

data set used in the paper. Sections 4.4 and 4.5, respectively, discuss the empirical methodology and estimation results. Concluding remarks are presented in Section 4.6.

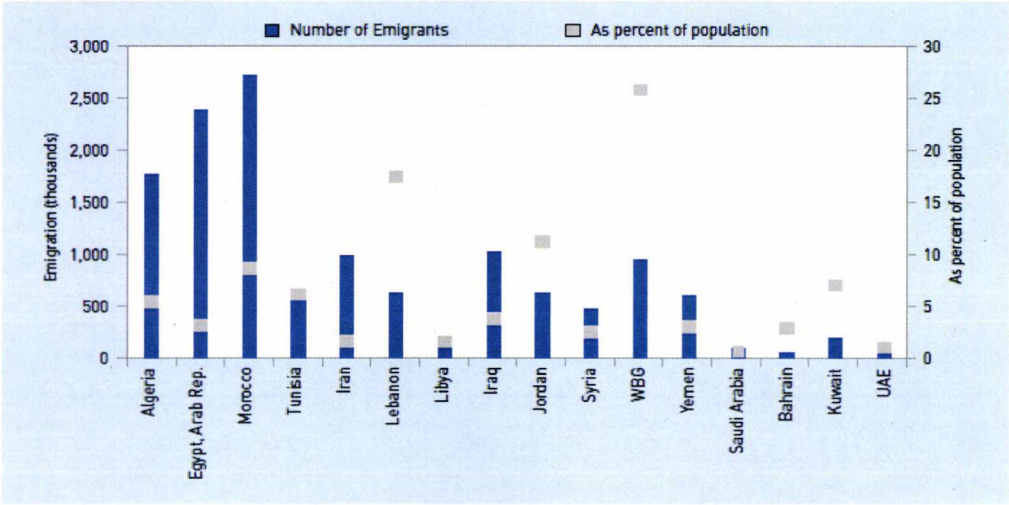
4.2 Migration trend and remittance flows in the Maghreb

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 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 Moroccan and 7,854 Tunisians in 2008 while Spain received a higher flow of migrants from Morocco (93,623) in the same period.[47]

Despite more restrictive migration policy over the past two decades, the flow of migration from the combined North African countries (Morocco, Tunisia, Algeria and Egypt) remains impressive. Of the top-thirty emigration countries in the world in 2005, three were North African (Morocco with 2.7 million emigrants – 9 per cent of its population; Egypt with 2.4 million – 3 per cent of its population and Algeria with 1.8 million – 5.4 per cent of its population). Even Tunisia's migration is higher than the world's average, with more than 620,000 migrants, accounting for more than 6 per cent of its population (Figure 4.1).

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

Figure 4.1 – Middle East and North African Region Emigration 2005



Source: World Bank, Development Economics Group data.

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. After 2000, the flow of emigrants from North Africa is likely to have increased in the last 10 years with continued labour force growth (2.8 per cent a year for the region)[48] and high unemployment in the presence of limited labour demand playing their part as the main push factors. An updated dataset on immigrants in the OECD and non-OECD countries has been recently made publicly available in the OECD website.[49]

[48] Includes Morocco, Tunisia, Libya, Algeria and Egypt.
[49] http://www.oecd.org/document/33/0,3746,en%202649%2037415%2046561249%201%201%201%203741%205,00.html

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.[50] More recently, Docquier *et al.* (2009) have developed a dataset that highlights worldwide migrants' skill levels in the OECD.[51] Looking at the skilled migration rate of the Maghreb region in 2000, Morocco has almost 20 per cent of its skilled workforce living abroad, Tunisia around 13 per cent and Algeria almost 10 percent.[52] It is not clear if this 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 relative unemployment, industry structure and career opportunities for the highly skilled are also considered to be important.

The migrant profiles from North Africa have also changed with respect to the gender composition. Before 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 per cent of active Moroccan migrants in Europe are females – a 45 per cent 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

[50] 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

[51] 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.

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

EU has increased in the last two decades.[53] Irregular 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.

The surge in informal migration came in the 1990s with the emergence of new destinations (mainly Spain and Italy). The establishment of migrants' networks and the increasing demand for flexible, cheap labour and a large degree of informality in sectors where North African individuals work made it easy to find jobs without official channels. Moreover, the introduction of the Schengen visa and the increasing restrictiveness of immigration policies in Europe seem to have further contributed to make migration irregular as both demand and supply of migrant work continues to be strong. Due to the secret nature of these movements, accurate figures of individuals involved are difficult to estimate. The main two routes of illegal migration from North Africa to Southern Europe are Spain (estimated as 14,000 to 21,000 persons yearly from Morocco) and Italy (approximately 80,000 migrants per year, primarily from Libya and Tunisia, landing in Sicily and Malta) (see El-Sayed Hassan, 2009).

North African population movements have generated a consistent flow of transfers to origin countries. The entire MENA region receives 10 per cent 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 per cent 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.[54] 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 per cent 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, the impact of this decline may be significant. Nevertheless, remittance flows are forecast to increase again in the coming years.

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

4.3 Data

The dataset used in the 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.[55] The survey was conducted across a few specific regions in each of these countries, as reported in Table 4.1. 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 provides a unique opportunity to consider the microeconomic behaviour of return migrants across the Maghreb region.

Table 4.1 - 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

The main objective of the MIREM project is to provide a better understanding of the challenges linked to return migration (as the reintegration path) and its impact on economic development. These outcomes are achieved by utilising questionnaire

[55] 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.

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 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 to do so.

The MIREM survey is composed of 992 return migrant interviews with approximately 330 individuals in each country interviewed between September 2006 and January 2007 using a common questionnaire.[56] We construct a variable to find the migrants' age of their first exit and we restrict our analysis to individuals who at the moment of departure were older than 16;[57] 62 was the age of the oldest individual who started the migration experience. Because of lack of information on some of the relevant variables used in our analysis, our final sample considers those individuals who at the moment of departure were aged between 16 and 55. This sample includes students, housewives and retirees since a small percentage of such respondents were observed to engage in remittance behaviour. [58] However, individuals with missing relevant information are excluded. These restrictions result in a final sample of 785 return migrants.

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. The frequency of remittances is reported on Table

[56] See www.mirem.eu/datasets/survey/methodological-approach

[57] There are two reasons behind this decision. First, we consider those individuals who were old enough to be conscious of the experience overseas and second, we find that those who left the country very young do not provide accurate information on their conditions before leaving the home country. Missing information may depend on the fact that they were too young to remember the period before migration.

[58] The fact that some individuals in the inactive category are able to remit leads to some considerations: perhaps retirees were remitting from their retirement allowance or from non-wage income; for students and housewife the source of their transfers may come from some part-time jobs, perhaps in the informal sector. It is also possible that students remit from their scholarships. Moreover, for the case of France, at least, the remittances originated by housewives and students could be transfer payments from the benefit system, as students are eligible for rent relief and household could receive housing and child benefits if on low income (this on the condition that a household member works in France).

4.2 while Table 4.3 reports the distribution of remittance payments per annum by origin country.

Table 4.2 - Remittance frequency

Frequency of sending remittances	Algeria		Morocco		Tunisia		All	
	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 4.3 – 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 4.2 reveals that approximately 69 per cent 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%).

As mentioned earlier Table 4.3 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 are 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 euro and euro has been quite stable until now with a low inflation rate.

Of those who remitted, around 67 per cent 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 (89%) with a mean age of 26 years at the time of departure. Before migration, 33% were married and 71% of those who were married 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 abroad as well as those who married in the destination country. Summary statistics are presented in Table 4.4.

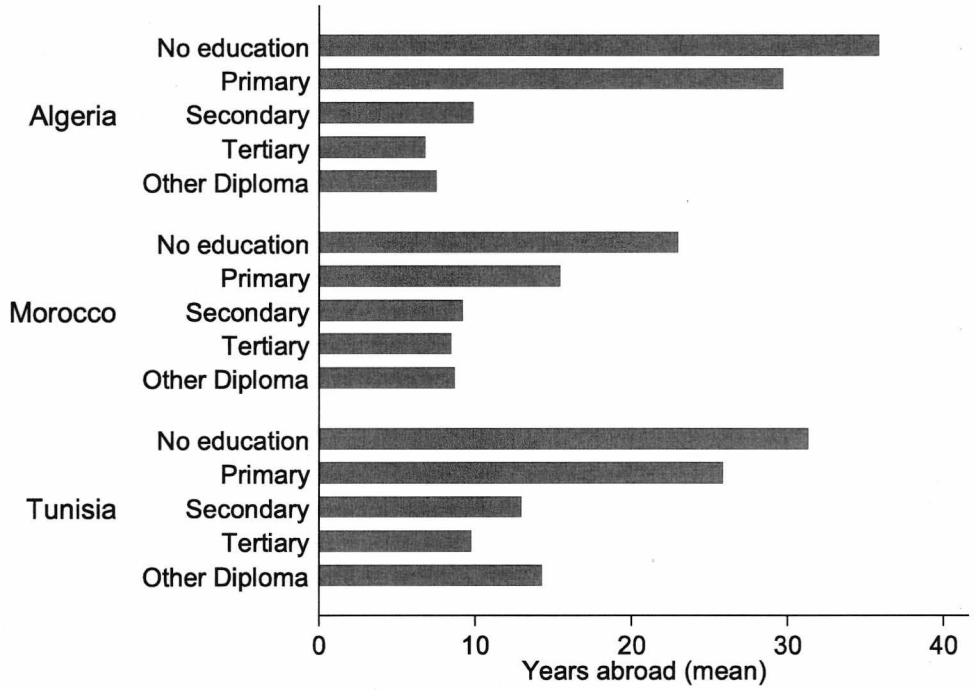
Survey information regarding migrants' level of education is provided both before and during the migration experience. Most return-migrants were relatively well educated prior to migration with 38% having completed secondary school certificate and a further 26% having completed tertiary education. Approximately 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 increased the higher the level of education pre-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 4.2).

Table 4.4 - Summary Statistics (selected sample)

	Algeria	Morocco	Tunisia	All
Female	13.20	8.06	11.44	11.25
Marital status				
Any other status	37.95	47.87	30.63	38.09
Married before migration*	34.32	21.33	31.37	29.81
Married abroad	27.72	30.81	38.01	32.10
Children before Migration	28.05	18.48	23.62	23.95
Financial situation before migration				
Very Good/Good	18.81	19.43	15.86	17.96
Satisfactory	34.98	53.55	44.28	43.18
Bad/Very Bad	46.20	27.01	39.85	38.85
Enter irregularly the host country	3.96	29.38	9.96	12.87
Household size abroad	2.98	3.74	3.47	3.35
Contact with HH members at home				
occasionally/never	17.82	7.11	10.70	12.48
at least once a year	10.56	3.79	4.80	6.75
at least once a month	37.95	36.97	31.37	35.41
every week	33.66	52.13	53.14	45.35
Last LF status overseas				
Inactive	19.14	4.74	13.63	13.38
Unemployed	5.94	5.69	4.43	5.35
Wage earner	67.66	63.03	62.73	64.71
Self employed	7.26	26.54	19.19	16.56
Final Education before return				
None	22.44	9.48	9.59	14.52
Primary school	16.50	18.96	23.25	19.49
Secondary	23.43	32.23	37.64	30.7
Tertiary	31.68	25.12	24.72	27.52
Other types of Diploma	5.94	14.22	4.80	7.77
Number of years abroad	17.90	11.43	17.03	15.86
Circular/Repeat Migrants	14.85	18.01	22.88	18.47
Investment upon return	17.82	40.28	40.59	31.72
Number of observations	303	211	271	785

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

Figure 4.2 – Period abroad by origin country and last level of education



A potential weakness of the MIREM survey is that it has no direct information regarding migrant earnings, which is, of course, an essential condition of remitting. To overcome this limitation, we consider an indirect measure to evaluate individuals' financial status using information in the survey questionnaire regarding their subjective financial "level".[59] Using this measure, approximately 61% of the sampled individuals declare themselves to be in a satisfactory or better financial situation. Furthermore, there is no evidence to suggest differences between Algerians, Moroccans and Tunisians using such a measure. Additional data relating to land ownership or being the owner of a house or apartment confirm this conclusion.

One of the main contributions of the MIREM database is to provide information on the labour force status of migrants at various points of the migration cycle. In our

[59] 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.

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 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 in 12 professional categories. We aggregate across these groups and reclassify migrants into one of four labour market states: inactive, unemployed, wage earners and the self-employed. The distribution of these labour market states is reported in Figure 4.3 and Figure 4.4. The wage earner category includes individuals with indefinite contracts, fixed term contracts, part-time and seasonal workers; and represents 64.7 per cent of the selected sample. The self-employed account for 16.6 per cent of the sample and includes business owners employing at least one person, regular and irregular independent workers, and those individual who report themselves as family workers.[60] The inactive and unemployed account for 18.7 per cent of the sample.[61,62]

[60] It may be argued that family workers should be considered in the wage earner category because they are employed by the family. Based on the special link that characterises relationships in a family we conclude that the interest of the worker coincides with the one of the family, therefore the decision to include them in the self-employed category.

[61] The unemployed are part of the workforce and therefore need to be separated from the inactive category composed of students, housewives and retired.

[62] Students account for approximately 6% of the selected sample, the majority of which are Algerian. Algerians are also the largest group reporting a status of unemployed prior to returning home. Retirees are more evenly distributed across the three countries and account for fewer than 5% of the sample.

Figure 4.3– Composition of the labour force status

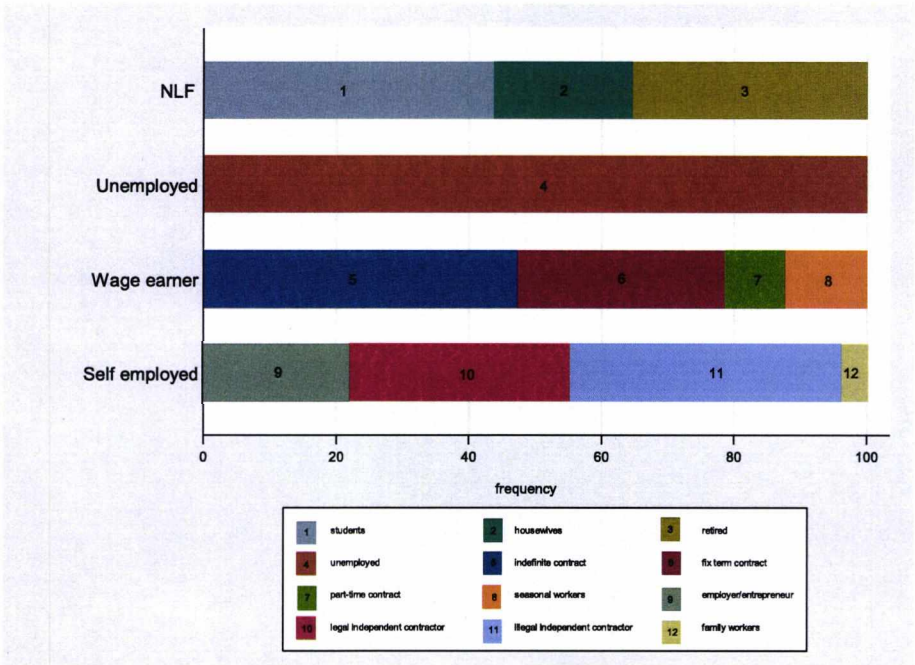
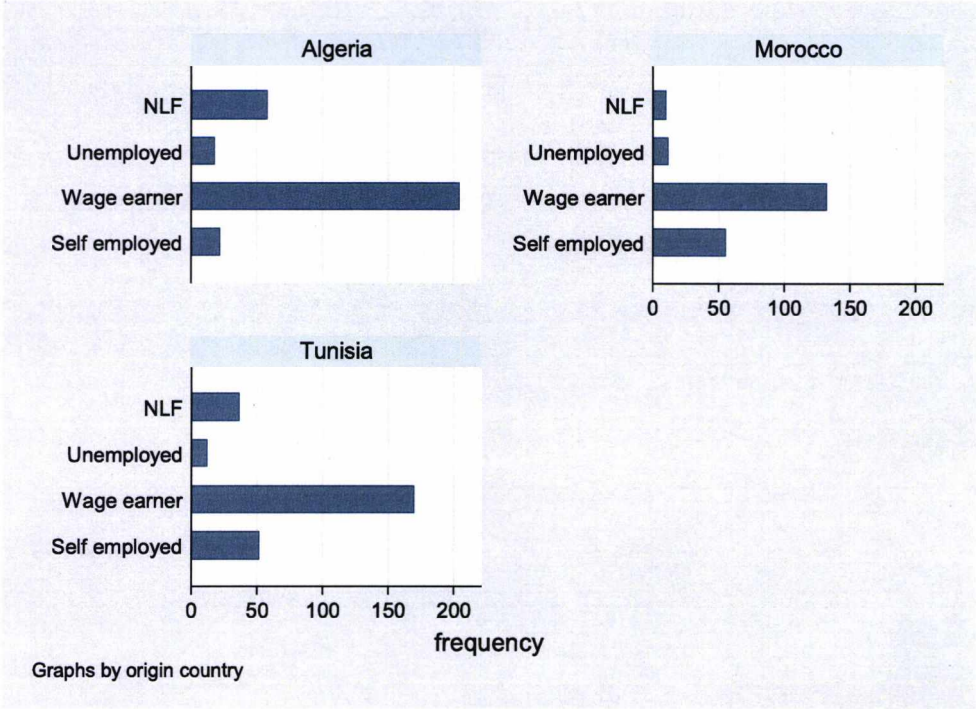


Figure 4.4 – Last activity in the host country by origin country



Some of the migrants (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. Table 4.5 shows France to be the primary destination country for migrants in our sample, perhaps reflecting past colonization, the existing networks of Maghreb-originating communities in France and/or the influence of French institutions and governance following independence. Moreover, the attractiveness of France as a destination country is probably also due to language and the compatibility of educational institutions. However, given our analysis is conducted from the perspective of the origin country (our sample comprises return migrants only), we do not consider the host country in explaining remittance behaviour.[63]

[63] We base this decision on the fact that we do not have sufficient information on the macroeconomic conditions that migrants face across different host countries at different point in time. We are aware of the fact that remittance behaviour may be affected by self-selection linked to destination country conditions. For a host country perspective of migration and remittances, see Miotti *et al.*, (2010).

Table 4.5 - Main destination country

Destination Country	Algeria		Morocco		Tunisia		All	
	n	%	n	%	n	%	n	%
France	228	75,25	60	28,44	134	49,45	422	53,76
Italy	10	3,3	102	48,34	36	13,28	148	18,85
Other EU	36	11,88	43	20,38	36	13,28	115	14,65
MENA region	16	5,28	2	0,95	57	21,03	75	9,55
Rest of the world	13	4,29	2	0,95	7	2,58	22	2,8
No reply	0	0	2	0,95	1	0,37	3	0,38

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 the family had been the main source of information in the returning process. Our sample shows that migrants had strong ties with the family in the origin country during the period spent abroad and we will investigate the effect of close family relationship on remittance behaviour. Furthermore, a significant proportion (31.7%) of our 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 remittances and/or savings accumulated abroad. We believe in a positive link between the amounts of remittances sent home and the investment decision upon return. Finally, individuals evaluate positively the experience abroad: 79.5% of the interviewees claimed to have taken advantages from the experience overseas and 38% of the return migrants think to repeat the migration experience.

4.4 Methodology

The decision to spend a period of the life cycle outside the country of birth may be a strategy to improve the quality of life (such as higher income, better job) upon return. Temporary migrants, or those intending to return, are generally believed to have a stronger relationship with relatives and friends left behind and overall with the home country in comparison to permanent migrants. This link may be reflected in a higher

probability to remit. Given that our sample is composed of return (hence temporary) migrants only, our main interest is to see how the decision and level of remittances is affected by individual characteristics and experience overseas.

In modelling the determinants of the migrants' transfers, it is important to consider the nature of the dependent variable. Since we observe only part of the population that remit a positive amount, remittances are bounded at zero and hence censored. In this instance, ordinary least squares (OLS) estimation will not yield consistent parameter estimates since the censored sample is not representative of the population. The conventional approach in this regard is to consider censored regression models such as the Tobit which treats the decision to remit and the amount remitted as a simultaneous decision. These models postulate 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 which 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 most likely represent the decisions of individuals, that is, we might expect remittances to be zero for some people.[64] In fact, the observed zeroes can be generated from two different processes: random zeroes (participation but not remittances) and behavioural zeroes (non-participation). Second, the model is restrictive in that it assumes the same mechanism underlies both the probability and the intensity to remit. Economic theory suggests that the decision to remit may depend on factors other than those that determine the level of remittances and common regressors may affect the two decision differently. Accordingly, an alternative framework with which to consider remittance behaviour is to utilise a two-part model which incorporates an explicit two-stage process for the decision and amount remitted. There are two variants of this class of models: the two step 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

[64] For example, in the context of a utility maximisation problem, the optimal choice for some individuals will be a corner solution such that $y = 0$.

to be corrected for the selection bias they contain; the double hurdle model or simple two-part model which permits different mechanisms to generate the alternative outcomes. Both models use two equations – one for the participation decision and the other for the level of remittances. The discussion that follows refers to the simple two-part model:

Remittance decision: $$d_i^* = z_i'\beta_1 + \varepsilon_i \text{ with } d_i = \begin{cases} 0 & \text{if } d_i^* \leq 0 \\ 1 & \text{if } d_i^* > 0 \end{cases} \quad (4.1)$$

Remittance level: $$\left(r_i \mid d_i^* > 0\right) = x_i'\beta_2 + v_i \quad (4.2)$$

Equation (4.1) represents the remittance decision of return migrants. The variable d_i^* is a latent variable which 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 $d_i^* \leq 0$. The z_i' is a vector of non-stochastic regressors and β_1 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 (4.2) 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.[65]

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 and utilising OLS is one recognised method to deal with this type of data. However, allocating values to open-ended groups is an *ad hoc* procedure that is known not to

[65] The two step selection 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.

produce consistent parameter estimates.[66] Accordingly, we adopt an alternative strategy and utilise the approach of Stewart (1983) which recognises that 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 (4.2) are independently identically normally distributed random variables with zero mean and variance σ^2. This yields the distribution of the unobserved dependent variable as:

$$r_i \sim N(x_i\beta_2, \sigma^2) \tag{4.3}$$

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

$$R_{k-1} < r_i \leq R_k \tag{4.4}$$

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:

$$\log L = \sum_{k=1}^{K}\sum_{i\in k}\log\left\{\Phi\left[\frac{(R_k - X_i'\beta)}{\sigma}\right] - \Phi\left[\frac{R_{k-1} - X_i'\beta}{\sigma}\right]\right\} = \sum_i \log\{\Phi_k - \Phi_{k-1}\} \tag{4.5}$$

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.

In the appendix C – Table 4.1C - we provide estimations using the alternative approach which treats the decision to remit and the amount remitted as simultaneous

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

decisions. 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.

4.5 Results

We fist present the results from the Heckman sample selection model which permits the possibility of dependence between the disturbance terms. Such model involves 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 exclusion restrictions permits the hypothesis of independence of the disturbances in Equations (4.1) and (4.2) to be tested directly and corrects for any selection bias arising from correlation between the two disturbances. We utilise frequency of contact with the household members while abroad and form of migration as exclusion restrictions to test formally between the two-part and Heckman alternatives but as shown on Table 4.6 we find no evidence of selectivity bias. [67] We conclude the two-part model to be the appropriate empirical framework to study remittance behaviour using the MIREM data and we report the estimates on Table 4.7.

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. [68] Under the two-part model framework, we discuss separately the determinants of the probability and level of remittances. The two-part model attains its

[67] The two potential exogenous variables were added as covariates in equation (4.2) and as expected they appear to be insignificant in explaining the amount of remittances sent to the home country and therefore we conclude they are valid exclusion restrictions. Moreover, the Mills ratio calculated from the first step equation is insignificant in the second step equation.

[68] Table 4.1B presents estimates for the ordered probit and count model assuming the joint mechanism for the remittance decision and amount.

flexibility by assuming that the two parts – the decision to remit and the amount remitted – are independent.

4.5.1 The Decision to remit

The results of the two-part model are reported in Table 4.7. Column (1) reports the marginal effects of a simple probit model on the decision to remit. The results reveal that gender has no impact on the decision to remit. By contrast, there are clear origin country effects with migrants from Morocco and Tunisia being 18% and 19%, respectively, 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 from the host country, there are some factors related to the home country that make Algerian behaviour different from the other two countries.[69] Contrary to expectations, marital status is not found to influence the decision to remit. However, having children prior to departure increases the probability of remitting by 16 per cent.[70] As the existing literature suggests, we expect a negative impact of the household size abroad on the probability to remit but in our case it is insignificant in explaining remittance behaviour. We may argue that the effect of the household size abroad is cancelled by the fact that the sample is composed of return migrants who do not plan to settle in the destination country.

Since we do not have any information on the income and earnings levels of our migrants before and during migration, we have used personal evaluation about the financial situation before migration.[71] Individuals who classified themselves in a "satisfactory" financial situation are 10 per cent more likely to remit than individuals who declare to be in a "good" position prior to emigration. The perception of a "bad" financial situation before migration does not impact the probability of remitting. This leads us to conclude that the pure altruistic hypothesis does not hold in this case.

[69] For example, Algeria is wealthier than Morocco and Tunisia and this may lead to a less incentive to remit.

[70] As discussed earlier, remittances may serve to finance children's education or to provide additional support to meet young family members' needs.

[71] 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.

As expected, entering the host country without regular documents increases the probability to remit by almost 11 per cent. This finding is consistent with Amuedo-Dorantes and Pozo (2006) who argue that since migrants are risk-averse individuals, those who face a higher income risk will tend to have a greater willingness to remit. Illegal migrants are also more likely to have a greater connection with family members at home and utilise remittances as a form of insurance against the uncertainty attached to their legal status (see Piracha and Zhu, 2012). Accordingly, we also expect a positive effect of illegal status on the level of remittances.

Family ties are considered to play a positive and significant role in explaining the decision to remit. In line with this argument, we find that keeping links through letters, e-mail and phone calls with the family members left behind impacts positively on the probability to remit. In comparison to the migrants who have no contact with the home country during the period abroad, migrants with annual, monthly and weekly contacts have respectively 20, 29 and 28 per cent higher probability of remitting. However, we cannot exclude that regular contacts with the family left behind depend on the fact that migrants send remittances at home.

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 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.

Different forms of migration are also found to impact upon the decision to remit.[72] For instance, circular migrants, i.e. migrants who move frequently between origin and host countries, are 9 per cent more likely to remit than migrants who return after one migration episode. This difference may be explained by the fact that circular migrants are most probably seasonal or short term contract workers who temporarily, but repeatedly, go abroad to work and enjoy their savings at home.

4.5.2 The amount remitted

Columns (2) and (3) of Table 4.7 report the determinants of the amount transferred conditional on the decision to remit. Column (2) reports results for the interval regression whilst Column (3) reports those of the ordered probit. As expected, the table reveals the significance and magnitude of parameter estimates for the estimation strategies to be very similar. Notably, we can discern that most of the determinants affecting the probability to remit are insignificant in explaining the level of transfers, thereby supporting the decision to adopt a two-part strategy. We do not consider the decision regarding the level of remittance transfers to be affected by either the frequency of contact with household members during the period abroad or the form of migration. Indeed, where the return is intended, given the 'temporary' nature of the migration activity, the frequency of contact with family should not significantly impact upon how much to remit, even though the frequency of such contact may potentially affect the willingness to pay. Indeed, the distinction between circular and return migrants does not influence the level of remittances because what matters here is the temporary nature of migration and not its form.

Gender does not impact the probability of remitting; however, in the case of the amount, female migrants transfer 56% less than their male counterparts. The finding

[72] Return migrants are those who migrated once and then returned to the home country for permanent resettlement. Circular migrants, on the other hand, are frequent (twice or more) movers between home and destination countries.

that women remit less than men is widely observed in studies on remittances. It may depend on disparities that still exist in the labour market between the two genders in terms of opportunities and earning levels, but also on the patriarchal nature of the society where only sons are supposed to support the family.

Surprisingly, having children before departure has a negative effect on the amount of remittances, contrary to being married before departure. Married migrants who did not change status during the period abroad remit 44 percentage points more than unmarried migrants. Also those who married abroad remit more than unmarried individuals. Remittances may be used to support the partner at home and any possible project that the married couple has in mind. As the existing literature suggests, the household size in the host country reduces the amount remitted. Even in the case of return migration, as the number of family members in the host country rises, the amount of money migrants remit decreases.

Illegal status does not only affect positively the probability to remit but also the value transferred. Under uncertain migration conditions individuals remit a greater fraction of their earnings. The insurance hypothesis is strongly supported by our findings: undocumented migrants remit 70 percentage points more than those who enter the host country under legal conditions.

Time spent abroad has a positive effect on the amount transferred. Many studies support the contrary; they find that remittances decline with the length of residence in the host country as a result of a greater "social distance" between migrant and home country that leads the altruistic concern to decline through time. This argument can be supported in the case of permanent migration that tends to weaken the ties with the origin country. However, as argued by Stark (1991) and supported by Mahuteau *et al.* (2010) there is a potential for an increase in remittance flows as the duration of staying abroad increases. We support this argument in the case of temporary migration. It is possible to think that as time passes the cost of settlement (home, car, etc.) decreases and the experience and skills gained may lead migrants to earn more. These may be the factors that increase the ability to send more to the family left behind, under the assumption that temporary migrants maintain strong ties with the household during the period spent abroad.

The perception of financial situation before migration, as well as labour force status and level of education, do not have any significant effect on the decision of how much is transferred. We have tried to aggregate and disaggregate the labour force status variable in different ways, for example classifying the different occupations according to the type of contract (long term, short term etc.) but no significant results have been found.[73] In an attempt to overcome this constraint, we introduced a variable that interacts education with the time spent in the host country. However, the interaction term is insignificant: we are not able to capture how education impacts the level of remittances.

[73] Rodriguez (1996) also finds no evidence of any impact of education on the level of remittances in the case of the Philippines.

Table 4.6: Heckman Sample selection estimation using interval regression in the second stage

VARIABLES	Participation	Level
Origin Country (Ref: Algeria)		
Morocco	0.186***	-0.041
	(0.038)	(0.178)
Tunisia	0.199***	-0.015
	(0.035)	(0.166)
Gender (female=1)	-0.025	-0.585***
	(0.057)	(0.208)
Marital Status (Ref: any other status)		
Married bef. migration	-0.069	0.424**
	(0.066)	(0.202)
Married abroad	-0.0037	0.259*
	(0.045)	(0.140)
Children bef. migration	0.165***	-0.258
	(0.051)	(0.205)
Financial situation bef.migrat. (Ref: good/very good)		
Satisfactory	0.105**	0.154
	(0.045)	(0.174)
Bad/very bad	0.071	-0.092
	(0.052)	(0.183)
Enter irregularly	0.109**	0.741***
	(0.051)	(0.171)
HH abroad	-0.000	-0.085***
	(0.008)	(0.024)
Contact with the HH at home (Ref: Never/occasionally)		
At least once a year	0.206***	
	(0.038)	
At least once month	0.293***	
	(0.043)	
At least once a week	0.289***	
	(0.051)	
Last LF status overseas (Ref: Inactive)		
Unemployed	0.087	-0.491
	(0.072)	(0.341)
Wage earner	0.343***	0.112
	(0.060)	(0.244)
Self-employed	0.235***	0.088
	(0.040)	(0.260)
Final Education before return (Ref: No educ)		
Primary	-0.037	-0.104
	(0.106)	(0.248)
Secondary	-0.320**	0.190
	(0.147)	(0.344)
Tertiary	-0.495***	0.168
	(0.153)	(0.426)
Other diploma	-0.377*	0.194
	(0.201)	(0.462)
Number of years abroad	0.002	0.032**
	(0.005)	(0.014)
N.years *Education	1.62e-05	-0.0083
	(0.001)	(0.005)
Circular Migrants	0.096**	
	(0.039)	
Inverse mills ratio		*0.255*
		(0.350)
Constant		6.571***
		(0.613)
lnsigma		0.0717
		(0.0503)
Observations	785	541

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

Table 4.7: Two-Part Model

	Participation	Level
Origin Country (Ref: Algeria)	marginal effects after probit	Interval regr
Morocco	0.186***	-0.111
	(0.0381)	(0.151)
Tunisia	0.199***	-0.088
	(0.035)	(0.132)
Gender (female=1)	-0.025	-0.563***
	(0.057)	(0.206)
Marital Status (Ref: any other status)		
Married bef. migration	-0.069	0.444**
	(0.066)	(0.201)
Married abroad	-0.003	0.258*
	(0.045)	(0.140)
Children bef. migration	0.165***	-0.311
	(0.051)	(0.192)
Financial situation bef.migrat. (Ref: good/very good)		
Satisfactory	0.105**	0.104
	(0.045)	(0.160)
Bad/very bad	0.071	-0.136
	(0.052)	(0.173)
Enter irregularly	0.109**	0.708***
	(0.051)	(0.165)
HH abroad	-0.000	-0.084***
	(0.008)	(0.024)
Contact with the HH at home (Ref: Never/occasionally)		
At least once a year	0.206***	
	(0.038)	
At least once month	0.293***	
	(0.043)	
At least once a week	0.289***	
	(0.051)	
Last LF status overseas (Ref: Inactive)		
Unemployed	0.087	-0.507
	(0.072)	(0.341)
Wage earner	0.343***	0.014
	(0.060)	(0.204)
Self-employed	0.235***	0.004
	(0.040)	(0.233)
Final Education before return (Ref: No education)		
Primary	-0.037	-0.103
	(0.106)	(0.249)
Secondary	-0.320**	0.243
	(0.147)	(0.337)
Tertiary	-0.495***	0.295
	(0.153)	(0.389)
Other diploma	-0.377*	0.260
	(0.201)	(0.454)
*Table follows in the next page		
Number of years abroad	0.002	0.0318*
	(0.005)	(0.014)
N.years *Education	1.62e-05	-0.008
	(0.001)	(0.005)
Circular migrants	0.096**	
	(0.039)	
Constant		6.800***
		(0.527)
μ2		
μ3		
lnsigma		0.072
		(0.050)
Observations	785	541
Log-likelihood	-356.34	-695.32

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

4.5.3 Remittance behaviour by type of return

The type of return (decided[74] vs. compelled[75]) is considered important in understanding and identifying the patterns of reintegration in the origin country (Cassarino, 2008). At the level of our selected sample, 601 migrants report that they decided/ chose to return home while the remaining 184 where compelled to do so. Differences exist in terms of 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 (37) of the compelled returnees is less than the ones who decided to return (49) 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). We investigate if these differences are relevant in the case of remittance behaviour. Given the difference in size between the two types of returnees, we 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. The test does not reject the null hypothesis of equality across the two groups.

Table 4.8 presents participation and level of remittances by type of return. Given that forced returnees have a higher probability to be irregular migrants, we expected a positive impact of irregular entrance in the host country on the probability to remit. The variable of irregular entrance is found positive for both types of returnees but looking at the effect on the probability to remit it is significant only for the decided returnees. In addition, having children before migration is insignificant when the return is forced. This could be possible 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 power due to the small sample of compelled returnees.

In terms of the form of migration, circular migrants have 22 percentage points higher probability to remit if they are compelled to return while it has no impact on the decided returnees. Circular migrants are much more likely to be the one who migrate to

[74] "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).

[75] "Compelled or forced return refers to a migrant who return to his/her country of origin as a result of unfavourable circumstances and factors which abruptly interrupt the migration cycle". In particular, forced return is the result of restrictive and selective immigration policies in the destination country (Cassarino, 2008).

enhance their earnings with no intention of settling in any country other the home country, which means most of the earnings are probably sent home. Contrary to the case of decided return, those who are compelled to return home are more likely to remit if they were in a bad financial situation before migration. It is possible to assume that a bad financial situation makes more likely to emigrate as an illegal migrants who then is compelled to return. Because of the bad financial situation at home the purpose of migration is to support the family left behind through remittances. Finally, the number of years spent abroad decreases the probability to remit for the compelled returnees; however, the same probability increases if better educated compelled returnees spend more time abroad.

Differences between the two groups of return migrants also persist in the variables affecting the amount remitted (as in the case of marital status and household size in the host country). The most interesting result is given by the variable capturing the duration of the migration experience. As expected, time spent abroad has a positive impact on the amount remitted for those who decided to return home but it is found insignificant for those who were forced to return. It may be explained with the evidence that on average we find 10 years of difference in the length of the period abroad for the two types of returnees. As argued in the previous section, fixed cost of migration decreases as the time spent abroad increases and experience and skill gained may lead the migrants to earn more and to generate a higher flow of money to the origin country. Because the duration of the experience abroad is shorter for those forced to return, they may not have had enough time to lower the initial costs and "gain" from the experience overseas. Another important consideration is that compelled returnees, who are for the majority illegal, may not be able to progress in their career during the migration experience because of their status.

Table 4.8: Two-Part Model by Type of Return

	Decided		Compelled	
VARIABLES	Participation	Level	Participation	Level
Origin Country (Ref: Algeria)				
Morocco	0.204***	0.024	0.216**	-0.543*
	(0.0389)	(0.177)	(0.0868)	(0.307)
Tunisia	0.224***	-0.052	0.223***	-0.404
	(0.040)	(0.150)	(0.076)	(0.294)
Gender (female=1)	-0.030	-0.498**	-0.064	-0.705*
	(0.066)	(0.238)	(0.121)	(0.396)
Marital Status (Ref: any other status)				
Married bef. migration	-0.033	0.365	-0.180	0.531
	(0.074)	(0.234)	(0.158)	(0.381)
Married abroad	0.008	0.0351	-0.0197	0.912***
	(0.0501)	(0.163)	(0.119)	(0.303)
Children bef. migration	0.157***	-0.311	0.093	-0.327
	(0.059)	(0.220)	(0.142)	(0.407)
Financial situation bef.migrat. (Ref: good/very good)				
Satisfactory	0.152***	0.093	-0.005	0.442
	(0.049)	(0.178)	(0.109)	(0.357)
Bad/very bad	0.040	-0.022	0.210**	-0.044
	(0.060)	(0.200)	(0.105)	(0.354)
Enter irregularly	0.221***	0.853***	-0.043	0.630**
	(0.036)	(0.206)	(0.127)	(0.292)
HH abroad	-0.00803	-0.111***	0.0207	-0.027
	(0.009)	(0.030)	(0.016)	(0.040)
Contact with the HH at home (Ref: Never/occasionally)				
At least once a year	0.196***		0.226***	
	(0.040)		(0.060)	
At least once month	0.244***		0.412***	
	(0.051)		(0.090)	
At least once a week	0.224***		0.486***	
	(0.060)		(0.102)	
Last LF status overseas (Ref: Inactive)				
Unemployed	0.191***	-0.649	-0.120	0.380
	(0.0461)	(0.458)	(0.219)	(0.731)
Wage earner	0.391***	-0.110	0.180	0.777
	(0.0700)	(0.222)	(0.160)	(0.636)
Self-employed	0.210***	-0.030	0.195*	0.591
	(0.044)	(0.259)	(0.118)	(0.663)
Final Education before return (Ref: No education)				
Primary	-0.027	0.018	0.085	-0.827
	(0.115)	(0.270)	(0.211)	(0.672)
Secondary	-0.344*	0.314	-0.378	-0.327
	(0.185)	(0.389)	(0.232)	(0.746)
Tertiary	-0.539***	0.381	-0.681***	-0.411
	(0.181)	(0.444)	(0.239)	(0.865)
Other diploma	-0.463**	0.118	-0.435	0.200
	(0.235)	(0.521)	(0.385)	(0.982)
Number of years abroad	0.002	0.032**	-0.031*	0.034
	(0.006)	(0.015)	(0.018)	(0.043)
N.years *Education	-0.000	-0.008	0.013**	-0.007
	(0.002)	(0.005)	(0.005)	(0.014)
Circular migrants	0.057		0.221***	
	(0.047)		(0.062)	
Constant		6.870***		6.514***
		(0.602)		(1.183)
Insigma		0.064		-0.026
		(0.057)		(0.104)
Observations	601	418	184	123
Log-likelihood	-258.34	-531.98	-76.15	-149.99

Notes: standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

4.6. Conclusions

The aim of this paper was to highlight the variables that determine the decision and the amount transferred by return-migrants of the Maghreb region, while they were abroad. Since the data consists of those who have actually returned to the home country, as opposed to the usual "intentions to return" data, the analysis carried out in the paper gives us a better perspective in terms of the determinants of remittances. The approach chosen to analyse remittances consists in separating the decision and level of the transfers. For this purpose we used a two-part model which distinguishes the participation equation (censoring mechanism) from the model for the outcome, conditional on the outcome being observed. A probit model was used in order to investigate on the decision to participate. Then, because the information on the amount of remittances was recorded in interval data, interval regression was deemed the appropriate method to apply in the second part of the model. Our findings support the decision to consider probability and level of remittances as generated by two different mechanisms as some variables seem to have a significant effect only on the probability and others only on the level of remittances.

The variables included in our model are the ones suggested by the empirical literature. The MIREM dataset gives us the possibility to distinguish the form of temporary migration in circular and permanent return. As expected, we have found that circular migrants have a higher probability to remit than those who return permanently after one migration episode. We believe that distinction between decided and compelled returnees is essential for understanding migrants' remittance behaviour. In fact, return is a process that requires time and preparation. 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 migrant himself or with his family. Under this assumption, return is part of the migration cycle and it occurs after the migrant has achieved his goals in term of human and financial capital (remittances and/or savings) in the destination country. In this context, the decision and the amount of remittances can express the willingness of investing in projects and activities upon return – individuals may respond to the need to

overcome credit constraints faced in the home country and realise their projects on return, which leads to a higher probability to remit.

The story is different in the case of compelled returnees. Given that the migration experience has been abruptly interrupted and therefore the return seems not to be in the intention of the migrant, it is possible to suppose that there is a strong altruism motive behind the remittance behaviour. The migrant did not plan to return home and remittances may have been sent to the family left behind to provide for their needs. Alternatively it could be driven by an insurance motive, eg, migrant might have known that there was a high probability of them to be deported, in which case remittances were sent to insure against the bad outcome, with the expectations of family support upon return.

Although the potential impact of returnees on development is known, scant attention has being paid to them in terms of analysis and policies for their reintegration in the country of origin. There is a lack of institutional mechanisms to support returnees' national reintegration and more effort should be done in this direction (Cassarino, 2008).

In fact, the ability of returnees to invest in the home country and contribute to its development depends 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 (Demurger and Xu, 2011; Piracha and Vadean, 2010) and therefore their contribution towards promoting development can be quite pronounced.

Appendix C

Table 4.1C: Probability and level of remittances as simultaneous decision

VARIABLES	Interval regression
Origin Country (Ref: Algeria)	
Morocco	0.356*
	(0.182)
Tunisia	0.454***
	(0.159)
Gender (female=1)	-0.660***
	(0.242)
Marital Status (Ref: any other status)	
Married bef. migration	0.279
	(0.238)
Married abroad	0.273
	(0.170)
Children bef. migration	0.0676
	(0.235)
Financial situation bef.migrat. (Ref: good/very good)	
Satisfactory	0.421**
	(0.185)
Bad/very bad	0.108
	(0.205)
Enter irregularly	0.949***
	(0.211)
HH abroad	-0.0833***
	(0.0302)
Contact with the HH at home (Ref: Never/occasionally)	
At least once a year	0.442
	(0.312)
At least once month	0.676***
	(0.225)
At least once a week	0.806***
	(0.230)
Last LF status overseas (Ref: Inactive)	
Unemployed	-0.0294
	(0.380)
Wage earner	1.015***
	(0.224)
Self-employed	0.999***
	(0.268)
Final Education before return (Ref: No educ)	
Primary	-0.211
	(0.319)
Secondary	-0.260
	(0.428)
Tertiary	-0.669
	(0.485)
Other diploma	-0.333
	(0.571)
Number of years abroad	0.0413**
	(0.0173)
N.years *Education	-0.00804
	(0.00632)
Circular migrants	0.124
	(0.162)
Constant	4.349***
	(0.656)
Insigma	0.417***
	(0.0521)
Observations	785
Log-likelihood	-930.321

Notes: standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

CHAPTER V

CONCLUSIONS AND REMARKS

The essays included in this thesis contribute to a better understanding of the role of migrants' remittances in the development process of the recipient countries. The large size of remittances suggests that how they are used by the recipient households may be of critical importance in many countries and have effects on poverty reduction, economic growth and development. Measuring the impact of remittances is complex given the difficulties in finding good quality data and the impossibility to observe the loss of domestic contribution of the migrant in terms of income and family duties. For determining the effect of remittances on several micro-level outcomes, researchers rely on advanced econometrics techniques to deal with unobservables and endogeneity of migration itself.

The empirical studies and literature covered in this thesis lead to conclude that the role remittances play is strictly determined by the context of analysis. On the one hand, there is evidence showing remittances lead to positive outcomes: they decrease poverty by increasing the income of the recipient households; they provide insurance against loss of income due to adverse household shocks; they can lead to investments in education, health and/or encourage entrepreneurship providing capital when there are financial market constraints.[76] The studies supporting a productive use of remittances conclude that remittances are transitory income and therefore are spent in 'productive' activities like human and physical capital. If this is the case then remittances should have a long term impact on growth and development of the receiving countries.

On the other hand, a more pessimistic view sees remittances as compensatory income and therefore spent more on consumption rather than investment goods (Chami *et al.*, 2005). However, it can be argued that even when remittances increase only consumption they generate further income for other local households which may reduce

[76] See literature covered on Chapter 2.

poverty even if they do not directly impact growth. Finally, a third view does not conclude for any impact of remittances on household expenditure neither in increasing consumption or investments goods: remittances are just a source of income and therefore no difference in the expenditure behaviour emerges from the households' remittance status. Overall, even if for these last two views remittances do not seem to encourage investments it does not mean they do not contribute to positive outcomes. Moreover, sometimes it is difficult to isolate the effects of remittances from other sources of income: remittances either consumed or invested may free up other sources which may be used differently

Each of these theories on remittances is supported by evidence which lead to conclude that the use of remittances depends on the context of the analysis and level of wealth in the household. Households who already meet their basic needs may use remittances for investment opportunities to overcome credit market constraints. However, those who struggle to meet subsistence needs are more likely to use remittances for covering their living cost and only in a second time they may direct remittances for investment purposes. Also, household characteristics, such as education, composition and location define how remittances are allocated by the household.

The context in which remittances are received is fundamental for determining their use. For example, a household whose members achieved secondary or tertiary level of education is going to be more likely to understand the value of education for the youngest as investment for their future. Therefore, recipient households with higher level of education among their members seems to allocate a higher share of their income (and remittances when received) to the education of their children respect to those households whose members are less educated. However, the existence of schools and universities in the local community or the possibility to reach them through affordable public transports (buses or trains) are essential element to provide the conditions in favour of investment in education. Access to school promote the use of remittances on education and it represents an example in which the context matters in understanding the potential use of migrant transfers.

It is not possible to analyse the impact of remittances on development extrapolating it from the context of analysis. Moreover differences in the allocation of remittances exist between those households living in urban and rural areas. For

example, the offer of road network is lacking in rural areas and this discourage investments. Creating and maintaining an effective road network for rural areas is essential in supporting rural economies. Remittances cannot be used productively and invested in education, health and entrepreneurial activities if there is no access to road network and motorways for accelerating the movement of people and the allocation of products as well as public transports, schools, hospitals, medicines, pharmaceuticals.

Another important condition which can contribute to a better use of migrant's transfers is political stability. In fact, in presence of civil wars, violence and high level of corruption individuals are less incentivised to make investments as they feel much more insecure about their future. Under instability the general investment climate suffers as it is threaten by uncertainty.

Remittances by themselves cannot compensate for the lack of suitable conditions and therefore it is not possible to expect that they can determine the growth and development of a country if there is not an environment that encourages investments. Policy makers should work to provide those conditions which sustain investments and make remittances or other sources of income a tool for the development of recipient countries.

The experience of a productive use of remittances in same contexts (Adams and Cuecuecha, 2010a; Yang, 2008; Taylor and Mora, 2006) should be used as example for those recipient countries which would like to promote the investment of remittances in activities linked to development. This does not mean that there is a "formula" to make remittances productive and therefore, it is not possible to give general advice to policymakers on what policy implement successfully for a positive effect of remittances on development. Each situation may be different and need the implementation of a specific policy. However, as discussed above, some common ingredients which sustain a good investment climate are: country stability, infrastructures and services such as motorways, hospitals, schools, banks, public transports. Therefore, policymakers should work to provide access to those infrastructures and services.

It is also important to understand the reason behind migration which may help explain for which purpose migrants send remittances to those left behind. Many studies focus exclusively on the impact of remittances on same relevant outcomes without taking into consideration the reason behinds those flows of money. In poor countries

with high level of unemployment remittances serve to cover daily needs and only with the help of policies which aim to reduce poverty remittances could be used, in a second stage, in productive activities. Moreover, even when remittances are use in consumption rather than investment they are not waste; they are functional to improve the quality of life of recipient individuals providing them with more or better food and commodities which may affect other dimensions of individuals' life: for example, when individuals are more satisfied with their life they are able to work or study more productively and this could be interpreted as a good use of remittances. Therefore, remittances could be functional to the development of recipient countries in different ways according to the specific context. Further research should stress the link between remittances and the conditions in the country of analysis to suggest ad hoc strategies for creating an environment with support a better use of remittances which may include different outcomes.

Different theories and evidence on the use of remittances were discussed in Chapter 2 where we investigated the impact of remittances on household expenditure behaviour in Senegal. A wide range of expenditures were considered: food, consumption and durable goods, housing and land, investment, education, health and other types of expenditures. We identify four different household remittance statuses: no remittances; receiving remittances from internal migrants; receiving remittances from external migrants; receiving both from internal and external migrants. The reason for considering the different remittance statuses separately is to capture whether or not the remittance origin affect their use. When we look at the average impact of remittances on the different categories of items we find some insight of a productive use only for external remittances. However, the analysis on the marginal spending behaviour does not reveal any significant role played by any remittance source and it seems that remittances are treated just as any other source of income.

As discussed above and more extensively in Chapter 2, the fact that we do not find evidence of a direct impact of remittances on productive expenditure, at the margin, does not mean that remittances do not play any indirect role in the recipient countries. The merit of remittance may be to increase income for the poor and/or decrease inequality rather than contribute directly to the development and growth of the whole economy. In this scenario the impact of remittances can be sharpened by appropriate

remittance policies. The World Bank (2006) identifies some policies which would result in stronger remittance flows to developing countries: public policies that encourage expansion of banking networks; allowing the banks of the origin countries to operate overseas, providing low-cost remittance services; provide competition in the remittance transfer market with the purpose of lower fees and transaction costs. Then, these policies encouraging remittance flows should be combined with policies channelling remittances to a productive use. In fact polities to increase remittances cannot work if, as mentioned above, there is not a good investment climate which needs country stability and existences of infrastructure and services.

The arguments in favour of positive outcomes generated by remittances due to an increase in the household income (income effect) contrast with the distortion that remittance can cause to the household labour decision substituting labour with leisure (substitution effect). In fact, if the income effect leads to welfare gain from remittances the substitution effect reduces this gain. Some empirical studies show that labour participation and number of hours worked of those left-behind decrease for effect of remittances (Funkhouser, 2006; Kim, 2007; Justino and Shemyakina, 2010); while others show a positive effect of remittances on investment in self-employment activities (Woodruff and Zenteno, 2007). It is difficult to separate income and substitution effects and both can strongly coexist. Funkhouser (1992) shows that, at the same time, remittances reduce labour participation but increase self-employment.

Developing countries suffer from financial constraints, which is a deterrent for investing in entrepreneurial activities. Studies on return migrants prove that the acquisition/accumulation of human and physical capital made returnees better off to set up a business upon return (Piracha and Vadean, 2010; Demurger and Xu, 2011). In Chapter 3 we contributed to the debate on the role of remittances for investment purposes looking at the impact of international transfers on the occupational choices of those left-behind in Tajikistan. The analysis, implemented using the control function approach to address the issue of endogeneity of remittance, support the view of productive use of remittances. In fact, the empirical results show that the amount of remittances received increases the probability for men to be in self-employment while their probability to work as wage employees decreases. Substitution and income effects can combine and weigh differently for different types of economic activities. Studies on

the effect of remittances on labour supply should investigate participation and number of hours worked separately for wage employment and self-employment activities to conclude whether or not remittances stimulate new businesses.

Especially in countries with capital constraints and high level of unemployment, as in the case of Tajikistan, the development of new activities may generate positive outcomes not only for those individuals or households investing in the projects but also for those who can find employment through the creation of jobs. Intuitively, at the beginning, migration would offer a safety valve for insufficient employment at home and remittances would be the way to finance new activities; in the long run, both migration and remittances would decrease as the country should be able to generate employment opportunities and therefore wealth by itself. However, again, this mechanism cannot work under political instability, corruption, lack of good infrastructures and underdeveloped financial system. Remittances may be a tool but not a solution for development; the risk is to rely on remittances rather than create development opportunities making the economy dependent on international transfers.

Finally, a deep understanding of the use of remittances and their implications on the recipient countries requires considering the theory on remittance motivations. The literature on the motivations behind remittances and migrant's characteristics affecting remittance behaviour is quite rich. Rapoport and Docquier (2006) present the most important remittances hypothesis supported by empirical evidences. The theory of remittance motivations distinguishes between individualistic motives (altruism, self-interest, exchange and the strategic motives) and family agreements (investment and insurance hypotheses). The motivations behind remittances interweave with the form of migration. The distinction between permanent and temporary migration is fundamental for understanding remittance behaviour and the nature of transfers (Glytsos, 1997). Evidence shows that migrants who intend to return to the origin country tend to remit more and more regularly (Dustmann and Mestres, 2010). In fact, migration and remittances may be part of a strategy to improve life upon return.

Therefore, given the relevance of the form of migration for understanding motivation, remittance behaviour and accordingly the use of remittances, Chapter 4 includes an analysis on the remittance behaviour of return migrants during their period abroad. In particular we investigate how migrant and household's characteristics

determine the decision and the amount transferred to the origin country. In empirical works it is not easy to distinguish clearly among the different remittance hypothesis especially when the form of migration is not identified. Our study captures the interaction between migrant's characteristics and form of migration which determines remittance behaviour; moreover, it looks at how migrants with different degrees of willingness to return exhibit different behaviours. In the discussion on remittance motivations and determinants, no study has considered the importance of the type of return. We distinguished between those who decided to return home for their own initiative from those who were compelled or forced to return. Because these two groups of returnees have different incentives to remit analyse them separately help to explain remittance behaviour. Moreover, the type of return may give some intuitions on the impact of returnees and remittances on the economic development of the origin country.

It is possible to speculate/assume that for those who choose to return to their country of origin, the migration experience was a strategy to accumulate human and financial capital in the destination country. In this context, the decision and the amount of remittances may express the willingness of investing in projects and activities upon return. Therefore the type of return can determine a productive use of remittances. Conversely, the remittance behaviour of the compelled returnees may respond to different reasons such as strong altruism or insurance hypothesis. In this case, it is more difficult to make hypothesis on the use of remittances.

It seems that the ability of returnees to invest in the home country and contribute to its development depends on the conditions of return. Programmes to support the reintegration of return migrants in the home country together with incentives for a productive use of remittances, as discussed above, play an important role to maximize the return from migration. Policymakers should work for make possible the reintegration of returnees incentivising them to share their experience and knowledge with those left behind which could be used, together with remittances and accumulating savings during the migration period, for the development and growth of the country.

Overall, the impact of migration and remittances on the countries of origin need to be analysed case by case. The context of analysis is important for investigating the effect of remittances and implementing policies targeting a productive use of those flows of money. Moreover, more work need to be done to provide better data and allow,

therefore, researchers to study the lights and shadows of remittances. The majority of data available on migration and remittances are cross-sectional data which allow limited analysis. More effort should be made to provide, for example, panel data which would help have a better extensive picture of the reason behind remittances, their use and their potential effect on growth and development. Richer data would improve the quality of analysis and the possibility to offer some more useful advice to policymakers.

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