LINKING MIGRATION AND HOUSEHOLD WELFARE IN CAMEROON:

Zooming into the Effect of Return Migration on Self-employment

Belmondo TANANKEM VOUFO
Ministry of Economy and Planning, Cameroon
Department of Analysis and Economic Policies
Email: tanankemvoufo@yahoo.fr

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Abstract

This paper investigates the effects of migration on household welfare and labour market participation (self-employment) in Cameroon. The Principal Component Analysis is used to construct an asset index combining 26 assets variables capturing ownership of household consumer goods (TV, washing machine, radio, etc.), productive assets (land, agricultural equipment, livestock, etc.), and access to basic utility services (potable water, electricity, sanitation, etc.). The data used for the analyses were gathered from the survey on the impact of migration on development in Cameroon conducted in 2012 by the Observatory on Migration of the African Caribbean Organization, in collaboration with the Institute of Demographic Research and Training. Making use of robust identification strategies to handle the endogeneity and selectivity issues, the study finds that having a migrant member or receiving remittances increases the households' per capita expenditures, and reduces the likelihood of living below the poverty line. In addition, migration and remittances contribute to the accumulation of consumer assets, to access to basic utility services, but do not significantly affect productive assets ownership. Besides, self-employment is more likely to occur in households having a return migrant, while receiving remittances decreases the probability of being self-employed. Meanwhile, the effect of the presence of absent migrants in the household on self-employment decision is negative but insignificant.

Keywords: Migration, Remittances, Welfare, Self-employment, Cameroon

1. Introduction

Migration has always been part of human history. However, with increasing globalization and urbanization, the phenomenon has gained importance in recent years. Indeed, there were 244 million international migrants in 2015, up from 191 million in 2005 and representing about 3.3% of the world population (UNDESA, 2015). Internal migration is even more common, as pointed out by UNDP (2009), with more than 740 million internal migrants worldwide. One of the direct implications of this migration trend is the considerable amount of remittances sent by migrants to their families left behind, especially in developing countries. The estimated official net inflow of remittances to developing countries reached US billion 439.8 in 2015, an increase of 29% over 2012 (World Bank, 2017).

Over the past three decades, the detrimental effects of migration dominated the literature, as noted by Owusu et al. (2008). Some negative socioeconomics effects of migration in sending areas were then highlighted, mainly driven by a shortage of labour, a decline in productivity, and the brain drain. Besides, the negative effects of migration in receiving areas were also mentioned, including the pressure on social amenities, increasing unemployment as well as declining living standards.

However, in recent years it has been acknowledged that if properly managed, migration can contribute to development both in sending and receiving communities (Awumbila et al., 2015). Migration issues have even been incorporated in the global development framework (Sustainable Development Goals), which makes seven explicit references to migrants and migration (Gery and Maggi, 2017). Moreover, migrant remittances have become an important source of foreign exchange revenues in many developing countries. These financial inflows can have important effects on recipient countries' economies, both from a macro and micro perspectives. From a macroeconomic perspective, remittances influence poverty reduction (Adams and Page, 2005), economic growth, entrepreneurship as well as financial development (Aggarwal et al., 2010), while from a microeconomic perspective, remittances contribute to household's income and expenditures (Adams, 2004, 2006).

First, remittances can contribute to health, education and nutrition expenditures, and hence positively affect economic growth in the long run through human capital accumulation. Moreover, remittances constitute an additional source of revenue for recipient households, and then directly improve household's well-being. Even if these remittances are fully consumed, as

pointed out by some authors (see for e.g. Acosta et al., 2007), they generally have a positive welfare effect.

However, because international migration can be an expensive venture, the better-off households are more capable of producing migration and receiving remittances (Stahl, 1982). Consequently, remittances could aggravate existing inequalities. In addition, as noted by Rodriguez and Tiongson (2001), remittances may raise the reservation wage or reduce the incentive to participate into the labor market, and hence negatively affect labour supply.

Given these mixed effects attributed to migration and remittances, it is difficult to determine not only the magnitude of the potential development impact of these financial inflows, but also the direction of these impacts (Acosta et al., 2007). Therefore, the study of the impact of migration and remittances on development outcomes remains an empirical question. Empirical evidences are thus needed to ascertain the signs as well as order of magnitude of the economic consequences of migration and remittances, as pointed out by Acosta et al. (2007).

This paper aims to contribute to the literature on the impact of migration and remittances on development outcomes, through the analysis of their impact on household welfare and labour market participation (self-employment) in Cameroon, one of the largest Central African countries in international migration. According to the International Organization for Migration (IOM), the number of Cameroonians living abroad was estimated at 4 170,363 in 2007, for a population estimated at 20 million inhabitants (IOM, 2009). On the other hand, in 2016 official remittances inflows to Cameroon were estimated at US$ 250 million, up from US$ 135 million in 2010, and representing approximatively 0.9% of GDP (World Bank, 2016).

However, despite the substantial number of Cameroonians living abroad and the large amount of remittances inflows to the country, the effects of migration and remittances on development outcomes in Cameroon are still not well known. The available studies have investigated the effects of migration on income poverty (Tamo, 2014) and on the education of left behind children (Kuepie, 2016), as well as the effects of remittances on households' expenditures (Meka'a, 2015). To the best of our knowledge, the effects on non-monetary poverty and employment have not been explored. This study aims to fill these gaps in the literature.

Although an increase in household income through remittances is expected to positively affect assets holding, whether remittances are mainly used for daily consumption and housing has been widely debated (De Haas, 2007). Remittances can indeed reduce income poverty in the short run, but if remittances help household accumulating productive assets, diversifying their

income sources through entrepreneurial activities, then a significant poverty reduction effect of remittances in the long run will be possible. Indeed, it is essential to focus on what migrants or their family can do or become as a result of the migration process if we want to provide a comprehensive understanding of the impact of migration on development outcomes. We then attempt in this study to investigate the effect of migration and remittances on productive and non-productive assets holding, as well as on labour market participation (self-employment). Making use of robust identification strategies to handle the endogeneity and selectivity issues, the study distinguishes itself among the existing literature in Cameroon.

It is also worth noting that Tamo's study employed the Heckman's two-steps approach to correct the potential endogeneity of migration, and found that migration reduces poverty incidence but does not significantly affect inequalities (depth and severity of poverty). However, in Cameroon, and according to the data from the survey on the impact of migration on development in Cameroon (SIMDC), half of the households with migrant members does not receive remittances. Consequently, it seems more appropriate to consider reception of remittances as treatment rather than having a migrant member. In the current studies, we consider both treatments. In addition, we investigate the impact of these treatments on household welfare measured both in monetary and non-monetary terms, as well as on labour market participation (self-employment). The data used for the analyses are from the survey on the impact of migration on development in Cameroon conducted in 2012 by the Observatory on Migration of the African Caribbean Organization, in collaboration with the Institute of Demographic Research and Training.

The rest of the paper is structured as follows. The next section specifies the theoretical framework and provides an overview of the related empirical literature. Section 3 discusses the methodology, while Section 4 is devoted to data sources presentation and preliminary descriptive evidences. Results are reported and discussed in Section 5, whereas the last section concludes and provides policy implications of the results.

2. Literature review

In this section, we review the literature on the impact of migration and remittances on household welfare and labour market participation. We first present the theoretical background, and further an overview of the empirical literature.

1.1.Theoretical framework

Migration can be defined as "a process of moving, either across an international border, or within State" (International Organization for Migration, 2004). The reasons why people migrate have been the subject of a longstanding debate. According to the economics models, decisions to migrate are based on differences in returns to labor across countries. An individual maximizes his/her utility by choosing the location where s/he can gain the highest income, giving his/her education and skills level. From this view point, migration is only explained by differences in economic opportunities across countries. In addition, for some authors such as Todaro (1969), utility maximization is based on individuals' utility, while other authors extend the maximization to the household's utility.

Another important determinant of migration is relative deprivation, as highlighted by Stark (1991). In this regard, people compare themselves with other peoples in their community, and if they feel their relative position is not rejoiceful, they will be motivated to migrate in order to improve their relative position. The relative deprivation can also be seen at the group level, in the sense that individuals belonging to groups with higher inequality will have higher propensities to migrate (Stark and Bloom, 1985).

Moreover, the New Economics Labour Migration (NELM) views migration as a livelihood diversification or risk reduction strategy. As pointed out by Taylor (1999), migration is part of a household strategy to overcome market failures (imperfect credit and insurance markets, loosen production and investment constraints). Decision to migrate is thus made jointly by the migrant and the wider social entity, including his household (Stark, 1991). Even when the decision to migrate is solely done at the individual level, there are some altruistic motives behind the decision. The migrant is expected to find better job opportunities abroad and send remittances to supports his/her relatives left behind.

If economic differentials across countries and historical dependency relations are the main determinants of migration, as assumed by the traditional migration theories, why is it then that despite having similar characteristics, some people migrate whereas others do not? According to some recent contributions to the debate, migration should be viewed as an "intrinsic part of the broader process of development, social transformation and globalization" (Castles et al., 2014). According to the authors, migration is likely to be driven by the development process, which increases capabilities and aspirations to move.

Moreover, there are two approaches of the impact of remittances on welfare in the literature. On the one hand, according to the neo-liberal-functionalist approach, remittances have a positive effect on development outcomes (Skeldon, 2002), while from the historical-structuralist perspective, remittances are assumed to create dependent relations between sending and receiving countries (Portes and Borocz, 1989), and to accentuate inequalities.

The theoretical framework of this study is based on the NELM theory. We view migration as a strategy for households to diversify their livelihood, and we seek to shed light on the potential role played by migration in ensuring households' welfare in Cameroon.

1.2.Empirical evidences

We first present a general review of the literature, and further a specific literature review for Cameroon.

1.2.1. Migration, remittances and poverty

The impact of migration and remittances on poverty depends on whether we are looking at the macro, community, or household level.

Effects at the macro level

Studies at the macro level make use of aggregated country-level data. Data on remittances are generally official estimates from the Balances of Payments. Adams and Page (2005) analyze the effect of international migration and remittances on inequality and poverty for 71 developing countries. The study instruments for the endogeneity of international migration as well as international remittances, and establishes that a 10% increase in the share of international migrants in a country's population induces a 1.9% decline in the absolute poverty incidence, while a 10% increase in per capita international remittances leads to a 3.5% decline in the poverty incidence. This poverty reducing effect of international migration and remittances has also been found for Sub-Saharan Africa (Gupta, Patillo and Wagh, 2007), and Central and Southern America (Acosta et al., 2007). At the macro level, remittances could also help countries improve their creditworthiness and therefore enhance their access to international financial markets (World Bank, 2011).

However, other studies have found a negative impact of migration and remittances on poverty. For instance, in a study of 113 countries over the period from 1970 to 1998, Chami et al. (2005) found a negative and significant effect of remittances on per capita GDP growth. Another study on a panel of 13 Latin American countries by Amueldo-Dorantes and Pozo (2004) found that a

large remittances inflow could lead to significant exchange rate appreciation, and consequently deteriorate the price-competitiveness. Indeed, the study shows that a doubling of remittances will lead to a 22% real exchange rate appreciation. Another study by Spatafora (2005) on a panel of 101 developing countries over the period 1970-2003 finds no direct link between remittances and per capita output growth.

Effects at the community level

In the presence of market failures, remittances can help building infrastructures (schools, hospitals, water facilities, etc.) at the level of the community. Remittances can also increase households' consumption and hence increase the demand for goods and services locally produced (Keely and Tran, 1989). In addition, remittances can help households overcome credit constraints, and engage in productive entrepreneurship activities, as pointed out by Adams (2006). Migration can also be associated to technology transfers through skills acquisition.

However, according to some authors, households receiving remittances are more likely to engage in family entrepreneurship activities, with very limited multiplier effects in term of employment opportunities generation (Amueldo-Dorantes and Pozo, 2006). International migration could also aggravate existing inequalities and lead to social tensions.

Effects at the household and individual level

Adams (2004, 2006) analyses the effects of domestic and international remittances on poverty and inequality at the household level in Guatemala and Ghana respectively. He estimates the counterfactual recipient household's expenditure that would have been observed in the absence of migration, and finds that remittances reduce poverty but has no impact on inequality in both countries. Moreover, in a study on Lesotho, Gustafsson and Makonnen (1993) find that if all remittances were removed the poverty incidence would rise from 52 to 63 percent.

According to Ghosh (2006), remittances can contribute to the construction of modern houses, the improvement of farm production (through access to land, agricultural equipment or fertilizers) and the growth of income-generating small business enterprises. For instance, there are evidence that remittances recipient families use the money transferred to hire labour and purchase equipment, hence upgrading farm production (Stahl, 1986; Kerr, 1996).

However, there are some evidences that migration and remittances can negatively affect agricultural productivity. For instance, a study on Morocco by Glytos (1998) found that remittances had a negative impact on agricultural output because some farmers were able to abandon work and live from remittances.

Most of the studies investigating the effects of migration and remittances on poverty at the household level have considered an income-based definition of poverty. Only few studies have considered non-monetary poverty measures. In this regard, Anderson (2014) investigates the effects of international migration and remittances on households' welfare in Ethiopia. Both subjective measures (households' subjective economic well-being) and objective measures (assets holding) are used to define welfare. Principal Component Analysis (PCA) is used to construct a productive assets index and a consumer assets index. Applying Propensity Scores Matching (PSM) estimation techniques, the study establishes that remittances have a significant impact on subjective economic well-being and consumer assets accumulation, but no effect on productive assets. The author explained this result by the fact that the time-period under study was relatively short (five years), since the effects of remittances on productive assets accumulation may take more time given the high costs involved in acquiring such assets. Another reason pointed out by the authors is that remittances are mainly used for daily consumption and debt repayment rather than invested in productive assets acquisition (Anderson, 2014).

Moreover, Tapsoba (2017) assesses the impact of remittances on poverty in Burkina Faso, computing a poverty index using household characteristics. Applying the PSM technique, he finds that remittances have a poverty reducing effect. More so, remittances have a higher impact on households' resilience when they have experienced disasters in the past.

1.2.2. Migration, remittances and labour market

Migration and remittances constitute an input that may affect households' labour participation decision. However, there is no consensus in the literature on the direction of the effect. Migration can affect occupational choices through several channels, as pointed out by Giulietti et al. (2013). Indeed, remittances received by households with absent migrants may provide the required capital to set-up a business. Meanwhile, migration of a member can deprive the household of manpower or entrepreneurial skills, or remittances received by the household can provide the family with the means to live without the need of extra earnings (Giulietti et al., 2013).

Narazani (2009) analyses the effects of remittances on the labour participation decision of the Albanian non-migrants. The study finds that only non-migrants wage workers substitute income for leisure when they receive remittances. However, for the same country, Dermendzhieva (2009) finds that for females and older males, having a migrant within the family is positively related to labour force participation, while receiving remittances reduces the incentive to

participate into the labour market. More so, Ndiaye et al. (2015) investigate the effect of migration and remittances on labour market participation and human capital in Senegal. They found that migration and remittances reduce labour market participation of household members with migrants, and that remittances increase education and health expenditures. Besides, Salman (2016) investigates the effects of migrant remittances on self-employment and welfare among recipient households in Nigeria. He finds that remittances decrease the probability of recipients being self-employed by 28.4%. In addition, recipient households have a 97.3% higher per capita expenditure than non-recipient ones.

Most of the studies investigating the effect of migration on labour market participation have only focused on the left-behind, whereas only few have paid attention to the returnees. In this regard, Giulietti et al. (2013) established that return migration promotes self-employment among household members that have not migrated, while left-behind individuals are less prone to be self-employed as compared to those living in households with no migration experience. Besided, the major shortcoming of the studies reviewed in this subsection is the use of cross-sectional data. For instance, Ndiaye et al. (2015) found that migration and remittances enhance human capital accumulation, which in turn may lead to higher employability prospects in the long run. However, the study found a negative effect of migration and remittances on labour market participation.

1.2.3. Cameroon's specific related literature

Migration in Cameroon is part of families' livelihood strategies. A qualitative study conducted by Fleischer in 2006 revealed that political and economic uncertainty are one of the main driving forces of migration (Fleischer, 2006). The economic crisis that the country witnessed in the 1985s reduced the possibilities of sustainable livelihoods. It became more difficult for youth, even for highly educated ones to find a job. Young Cameroonians then generally migrate to find a job abroad and send remittances to support their relatives.

Altruism, family arrangements and self-interest are the main motives behind migrants' remittances in Cameroon (Tamo, 2014). Regarding the altruism motive, migrants generally send remittances to support their family left behind (contributing to education, health or social expenditures), as noted by Kamdem (2007). Remittances are also sent in case of special events such as funerals or other ceremonies (weddings, baptisms, etc.). As far as family arrangements are concerned, families (direct or indirect) generally contribute to the migration-related expenses, and in return the migrant is expected to send remittances to compensate. The compensation can also be done through the facilitation of other family members' migration. As

for the self-interest motive, migrants also send money for investment purposes (building houses, or starting business), as highlighted by Mimche (2009).

The literature on the impact of migration and remittances on development outcomes in Cameroon is very sparse. Tamo (2014) analyses the impact of migration on poverty and income inequalities in Cameroon, adopting an income-based definition of poverty and employing the Heckman's two-steps approach to correct the potential endogeneity of migration. Using data from the survey on the impact of migration on development in Cameroon, the study finds that remittances reduce poverty incidence by 32.1%, but not significantly affect inequalities (depth and severity of poverty).

Meka'a (2015) analyses the impact of remittances on households' expenditures behavior in Cameroon, distinguishing five expenditures categories: food, durable goods, housing, education, health and other expenditures. He also distinguishes three categories of households (those receiving internal remittances, those receiving international remittances, and non-recipient households), and uses a multinomial logit model to estimate the probability for a household to belong to any of these categories. Based on the multinomial logit regression, a Mills ratio was calculated and included as explanatory variable in the expenditures' equation. Using data from the third Cameroon's Household Consumption Survey conducted in 2007 by the National Institute of Statistics, the study finds that households receiving international remittances spend less on food as compared to their non-recipient counterparts. Besides, recipient households (of both internal and international remittances) spend more on education and housing than non-recipient ones. Remittances are thus found to enhance human capital accumulation and to improve living conditions.

Moreover, Kuepie (2016) investigates the effect of migration on the education of left behind children in Cameroon. Applying Propensity Scores Matching and weighted regression, he establishes that the effect of international migration on children's school attendance is in general non-significant, but it is negative for the case of parental migration. In addition, the detrimental effect is more pronounced for boys.

As far as the impact of migration and remittances on labour market participation is concerned, to the best of our knowledge, no study has explored this issue for the case of Cameroon. Regarding the impact on poverty, the few studies that have been conducted have focused on an income-based definition of poverty.

3. Methodology

This section discusses the conceptual issues related to the study, presents the data sources, and describes the methodology adopted to investigate the effects of migration and remittances on household welfare and labour market participation (self-employment) in Cameroon.

3.1.Conceptual issues

This subsection presents the definition as well as measurement of the key concepts which will be used in the study.

3.1.1. Migration

There is no universally accepted definition of migration, mainly because of the heterogeneity of the processes and experiences involved in migration issues, as pointed out by Awumbila et al. (2014). Hence, a person considered as a migrant in one context may not be considered as such in another context (Songsore, 2003). In the context of this study, migration is defined as in the survey from which data used for the empirical analysis are gathered. Two types of migrants are considered, namely absent migrants and return migrants. The issue of internal migration was not covered by the survey, which focused on the impact of international migration on development in Cameroon.

An absent migrant is someone who used to live in the household but who left between August 2002 and the date of the survey, and is living abroad. It is worth noting that the survey was conducted in 2012. Consequently, a household member who stayed abroad for more than 10 years is not considered as a migrant. The argument behind this definition is the fact that generally the more the migrant stays abroad, the less s/he sent remittances back home. However, this definition can be criticized, because there are non-regular migrants who can stay abroad for several years but still sending remittances. Moreover, a return migrant is a household member who was born or resided in Cameroon but who has lived in another country for three months or more. In this study, our focus will be on international migration.

3.1.2. Remittances

Remittances are defined as the money sent to Cameroon by absent migrants. The survey first identified the absent migrants in each household, and then asked the following question: "*How much did the household members received from (name of the absent migrant) in the past 12 months?*" A household is considered as recipient of remittances if at least one member received remittances from an absent migrant member in the past 12 months prior to the survey. The

survey also asked whether households members received remittances from friends or relatives living abroad, but the frequency for this category of remittances was very low and the amounts not substantial. Consequently, our focus is only on remittances sent by absent migrants who are members of the household.

3.1.3. Household welfare

As noted by Ravallion (1994), some questions are crucial when it comes to assessing poverty: "How do we assess individual well-being or welfare?", "at what level of measured well-being do we say that a person is not poor?" and "how do we aggregate individual indicators of well-being into a poverty measure?". The two first questions refer to an identification problem (when do we consider a person as poor? And when the person is considered as poor, how poor is s/he?), while the third question refers to an aggregation problem. In the current study, we adopt both income and non-income based definitions of welfare. From the income perspective, welfare is measured using household per capita expenditures, whereas the non-income approach is based on the construction of asset indexes following Fimer and Pritchet (2001). Income per capita expenditure measures households' current welfare, while the asset indexes reflect the long-run economic status.

- **The monetary welfare measures**

Two monetary welfare indicators are used in the current study. We first consider the per capita monthly expenditure, which is a proxy of per capita income. A large literature provides the theoretical underpinnings of consumption expenditures as a measure of welfare (see for e.g. Deaton, 1997; Deaton and Zaidi, 1999). The measure of expenditure includes all the expenses made by the household to satisfy its members' needs, such as nutrition, health, education, housing, clothing, leisure and transport expenditures, among others. Besides, we also consider the poverty status, which is a binary variable taking the value 1 if the monthly per capita expenditure falls below the poverty line, and 0 if not. It is worth noting that the poverty line is not available in the data set we are using for our analyses. Consequently, we make use of the 2012's PPP poverty line of 1.90 USD. Since expenditures were recorded in local currency, we used the annual average exchange rate to convert those expenses in dollars[1].

[1] The average annual exchange rate in 2012 was 1 USD= CFA 503.07

- **The non-monetary welfare measures**

The use of assets as a complement to traditional income-based definitions of welfare has become increasingly popular in recent years (Anderson, 2014). As pointed out by McKenzie (2007), assets measures have the advantage to involve less recall bias and mismeasurements. Following Fimer and Pritchet (2001), we use Principal Component Analysis (PCA) to construct four household welfare indexes: a Consumer Assets Index (CAI), a Productive Assets Index (PAI), an Utility Services Index, and a Composite Welfare Index (CWI). The CWI is a global assets index constructed using both consumer assets, productive assets and basic utility services related variables. The method consists of aggregating a large number of dummy variables related to households' assets ownership to obtain a composite index of household welfare. The major challenge faced when aggregating different indicators into a composite index is the choice of weights. The PCA approach has the advantage to avoid subjectivity in the choice of weights, and to define weights based on variables' distribution. Lower weights are attributed to assets owned by most of the households, while assets owned by few households record the highest weights. The weights used to aggregate the assets indexes are the scoring factors on the first principal component.

If for instance we have a set of N variables, $x_{1i}, \dots, x_{Ni}$ representing the ownership of N asset by each household i, then the value of the asset index for household i is calculated as follows:

$$Asset\ Index_i = w_1\left(\frac{x_{1i}-\bar{x}_1}{s_1}\right) + \cdots + w_N\left(\frac{x_{Ni}-\bar{x}_N}{s_N}\right) \quad (1)$$

Where $\bar{x}_j\ (j = 1 \dots N)$ and $s_j\ (j = 1 \dots N)$ respectively represent the mean and standard deviation of x_{ji} across households, and $w_j\ (j = 1 \dots N)$ the scoring factors of the N asset variables on the first principal component.

For the Productive Assets Index, the following assets are considered: *own land*, *own a sewing machine*, *own agricultural equipment,* and *own livestock*. Regarding the consumer assets index, we consider assets such as *TV*, *air conditioner*, *computer*, *phone*, *fridge*, *washing machine*, *gas cooker*, *bike/motorbike*, *car*, etc. The Utility Services Index includes variables related to access to the following facilities: *electricity*, *potable water*, *sanitary system*, *natural domestic gas*, and *communication* (mobile phone). Meanwhile, the Composite Welfare Index incorporates the consumer and production assets, as well as variables related to household access to the above basic services facilities. Separating productive assets from consumer ones can help shedding light on some channels through which migration and remittances might affect household welfare.

3.1.4. Labour market participation

Regarding labour market participation, our aim is to investigate the effect of migration and remittances on the decision of being self-employed. The survey captured the occupation of households' members, and distinguished the following categories: at school, wage earner, self-employed, unpaid work and retired. Our focus is on the self-employment category, and the outcome variable is a dummy variable taking the value 1 if the individual is self-employed and 0 if not. Moreover, the analysis is restricted to the working age population (15-64 years).

Having presented the definition as well as measurement of the key concepts of the study, we move on to specify the data sources and describe the identification strategy.

3.2.Data

The data used in this study are from the survey on the impact of migration on development in Cameroon (SIMDC), conducted by the Observatory on Migration of the African Caribbean Organization, in collaboration with the Institute of Demographic Research and Training. The survey was conducted from August to September 2012 and covered a random sample of 1,253 households. The sample includes households with international migrants, those with migrants who returned from abroad, as well as households with no international migration experience. Moreover, the survey collected information on migration and remittances experience of households, their characteristics (size, location, education, etc.), their expenditures, as well as on assets holding.

A two-stages stratified sampling approach was used. In the first stage, primary sampling units were selected using the weight of international migration at the departments' level. The departments further served as sampling frame for the draw of 82 villages/districts with probability proportional to size. In each village/district, a sample of 15 households was selected at the second stage. The 15 households were selected in such a way to include 10 households with at least one migrant and 5 households without migrants. After cleaning, our data set comprises 1,235 households and 5,865 individuals. Out of the 1,235 households, 256 reside in rural area, and 979 in urban area. More than half of migrants (53%) in the sample reside in African countries, while 36.8% reside in Europe, 6.5% in America and 3.2% in Asia. Moreover, 61% of migrants are males.

3.3.The identification strategy

One of the main challenges faced when investigating the causal impact of migration and remittances on development outcomes, especially at the household or individual level is self-selection. In fact, as pointed out by Anderson (2014), there might be unobservable characteristics that affect both the probability that the household has a migrant member or receives remittances, and the outcome of interest. Consequently, the subsample of households with migrant members or receiving remittances is not a random sample, so that the estimation of the effect of migration and remittances on development outcomes will lead to biased estimates unless the self-selection issue is addressed (Anderson, 2014). In the current study, three identification strategies that have been used in the related literature are adopted, namely the Instrumental Variables (IV), the Propensity Scores Matching (PSM) and the trivariate probit regression.

3.3.1. The Instrumental Variables approach

Our aim is to estimate the following equation:

$$Y_i = \alpha X_i + \beta Treat_i + \varepsilon_i \quad (2)$$

Where Y_i is the outcome of interest which could be the log of per capita income or poverty status of household i; $Treat_i$ is the treatment variable (having an absent migrant member or reception of remittances), X_i a set of households' observed characteristics and ε_i the error term. As already discussed, an OLS estimation of Equation (2) may lead to biased estimates if the potential endogeneity of the treatment variable is not addressed. In this regard, Equation (2) is estimated using the Instrumental variables (IV) approach which is a powerful tool in dealing with endogeneity. The two-stage least squares (2SLS) method is used. In the first stage, the following equation is estimated:

$$Treat_i = \beta X_i + \gamma Z_i + \varepsilon_i \quad (3)$$

Where $Treat_i$ is the treatment variable (as previously defined) for household i, X_i a set of households' observed characteristics including the household size, gender, age and education of the household head, dependency ratio, number of children, number of elderly, as well as location (urban versus rural), etc. These covariates have been proved to be major determinants of migration and remittances in the literature. Meanwhile, the descriptive analysis reported in the next section confirmed that these variables are potential determinants of migration and remittances in Cameroon. Moreover, Z_i refers to the instrument that identifies the treated

households, and ε_i to the error term. In previous studies, migration or reception of remittances has been instrumented using the migration rate by region, the number of Western Union Offices by region and the migration networks by region, the distance to a paved road, or the distance to a registration office (Amuedo-Dorantes and Pozo, 2006; McKenzie, 2007; Margolis, et al., 2013; Anderson, 2014; Meka'a, 2015). In our case, data on most of these variables are not available. Consequently, we use the district migration rate as instrument.

Meanwhile, for the instrument to be valid, it should be highly correlated with the treatment variable $Treat_i$, but not correlated with the unobserved characteristics that affect the outcome variable Y_i. Hence, Z should satisfy the following two conditions:

i) $Cov(Z, Treat) \neq 0$ (Instrument relevance)

ii) $Cov(Z, \varepsilon) = 0$ (Instrument exogeneity)

Before migrating, people need information on the country of destination or on the required procedures; they may also need a host in the country of destination. The existence of migration networks then facilitates and perpetuates the migration dynamics. The district migration rate, which is used as a proxy of the migration network at the district level, is expected to be correlated with migration (as well as reception of remittances).

Relevant tests (F-test for the excluded instruments, instruments weakness test) are performed to assess the validity of the instruments. The value of the treatment variable is predicted in (3) and included as explanatory variable in the second step regression:

$$Y_i = \alpha X_i + \beta \widehat{Treat}_\iota + \varepsilon_i \quad (4)$$

Where Y_i is the outcome variable, X_i a set of observed characteristics of households (as previously defined), $\widehat{Treat}_\iota$ the value of treatment variable predicted in (3), and ε_i the error term. Equation (4) is estimated using OLS technique.

However, since the potential endogenous variables (households' migration and remittances statuses) are binary, we also perform the IV regressions using a probit model at the first stage. In addition, some of our outcomes variables (poverty status and self-employment status) are not continuous, but rather binary. Consequently, the IV procedure previously described cannot be applied for these binary dependent variables, as pointed out by Carrasco (2001). We then resort to the solution suggested by the author, which consists of estimating a bi-probit model with endogenous binary regressor, using the Conditional Mixed-Process (CMP) framework.

3.3.2. The Propensity Scores Matching (PSM) approach

Introduced by Rosenbaum and Rubin (1983), the PSM is an approach used in impact evaluation settings to compare the participant's outcomes with and without treatment. The method assumes that participation to the program is subject to a selection based on observable characteristics. As in the IV approach, we still have two treatments here: having an absent migrant member and reception of international remittances. If T denotes the treatment and Y the outcome of interest (the household welfare measure), the average treatment effect on the treated group is defined by:

$$ATT = E(Y_{i1} - Y_{i0}|T_i = 1) = E(Y_{i1}|T_i = 0) - E(Y_{i0}|T_i = 1) \quad (5)$$

Where Y_{i1} denotes the outcome for the treated group (when $T_i = 1$) and Y_{i0} the outcome for the non-treated group (when $T_i = 0$). The average treatment effect on the entire population is given by:

$$ATE = E(Y_{i1} - Y_{i0}) = E(Y_i|T_i = 1) - E(Y_i|T_i = 0) \quad (6)$$

With

$$Y_i = T_i Y_{i1} + (1 - T_i)Y_{i0} \quad (7)$$

We then have

$$ATE = ATT + E(Y_{i0}|T_i = 1) - E(Y_{i0}|T_i = 0) \quad (8)$$

$E(Y_{i0}|T_i = 1) - E(Y_{i0}|T_i = 0)$ is a sampling bias due to the fact that the subsamples of treated and non-treated are not identical or random. If Y_{i0} and T_i are independent, then the sampling bias will be eliminated. Matching methods assume that conditional on some observable characteristics X, the outcomes are independent of treatment, so that the outcomes of non-treated units can be used to approximate the counterfactual outcome of treated units in the absence of treatment.

Propensity scores are used to match treated units and non-treated ones. These scores are estimated using a probit model as follows:

$$P(X) = \Pr(T = 1|X) \quad (9)$$

If the treated unit i is paired with the non-treated unit $\bar{\imath}$, then we will have $P(X_i) = P(X_{\bar{\imath}})$, and

$$Y_{\bar{\imath}} = \hat{E}(Y_{i0}|T_i = 1, X_i) = \hat{E}(Y_{i0}|T_i = 0, X_i) \quad (10)$$

The average treatment effect is thus estimated as the average of the differences in outcomes between treated units and their untreated counterfactuals:

$$\widehat{ATT} = \frac{1}{N}\sum_{i\in I}(Y_i - Y_{\bar{i}}) \quad (11)$$

Where I is the subsample of treated units, and N is the number of treated units. It is worth noting that practically, it is difficult for the condition $P(X_i) = P(X_{\bar{i}})$ to be satisfied. Consequently, several algorithms are used to perform the matching, notably the nearest neighbor matching, the kernel matching as well as the radius matching. The nearest neighbor matching matches each unit in the control group to a unit in the treated group based on the closest propensity score. This matching method has the advantage that all the units are matched, but the disadvantage is that the matching can be poor in the case units could be close but still have very different propensity scores. Regarding the Kernel matching, each treated unit is matched with a weighted average of all controls units, using weights that are inversely proportional to the distance between the propensity scores of the two groups (Anderson, 2014). Meanwhile, as noted by Caliendo and Kopeinig (2008), the Radius matching defines a tolerance level for the maximum propensity score distance (the caliper), and uses all the control units within the caliper as comparison units.

Moreover, for the matching to be valid, the balancing property should be satisfied, i.e. the average of the propensity scores should be the same between the treated and untreated groups. The common support condition should also be satisfied, which implies that the matching is performed only when there are sufficient data. In the implementation of the methodology we make use of the STATA command "*psmatch2"* which allows to impose the common support restriction and to perform the balancing test (*pstest*). The set of variables *X* used to estimate the propensity scores include: age, education, gender of the household head, education within the household, demography of the household (size, number of children, number of elderly) location (urban versus rural), as well as the district migration rate.

3.3.3. The trivariate probit regression

The CMP approach previously described is also used to investigate the effect of remittances on self-employment. As for the effect of migration, previous literature on the topic has pointed out the necessity to distinguish households with return migrants and those with absent migrants when investigating the effect of migration on self-employment (Demurger and Xu, 2011; Giulietti et al., 2013). This literature has also suggested the existence of a potential

endogeneity/simultaneity between the self-employment and migration decisions. In the light of the above, we formulate the following model:

$$\begin{cases} SE^* = \beta_1 X + \gamma AM + \delta RM + \varepsilon_1 & with\ SE = 1\ if\ SE^* > 0; 0\ otherwise \\ AM^* = \beta_2 X + \theta_1 Z_1 + \varepsilon_2 & with\ AM = 1\ if\ AM^* > 0; 0\ otherwise \\ RM^* = \beta_3 X + \theta_2 Z_2 + \varepsilon_3 & with\ RM = 1\ if\ RM^* > 0; 0\ otherwise \end{cases} \quad (12)$$

The variable SE connotes the self-employment state (1=self-employed, 0=other states), while AM and RM are dummy variables respectively indicating the presence of absent and return migrants in the household. Besides, X is a matrix containing standard socio-demographic characteristics. A recursive trivariate probit model is used to estimate the system (12). In this model, the parameters of interest are γ and δ; they capture the conditional differences in the probability of being self-employed between individuals in migrant households and those in non-migrant households, and between individuals in households with return migrants and those in non-migrant households, respectively (Giulietti et al., 2013).

Meanwhile, Z_1 and Z_2 are the selection variables, which are supposed to determine the probability of having absent or return migrants in the household, but to be uncorrelated with the outcome of interest (self-employment in our case). The district migration rate is used as selection variable in the current migration equation, while the migration destination (Africa versus other regions of the world) is used as selection variable in the return migration equation. Indeed, migration rate, which is a proxy for migration network, has been proven to be a reliable instrument of migration in the literature (Amueldo-Dorantes and Pozo, 2006; Mckenzie, 2007). Moreover, the majority of returnees (85.46%) have migrated to African countries (C.f. Table 1).

Before implementing the methodology described in the current section to empirically assess the effects of migration and remittances on household welfare and labour market participation (self-employment) in Cameroon, it is worth to perform a descriptive analysis to have an idea about the potential relationship among the variables of interest. The next section is devoted this descriptive analysis.

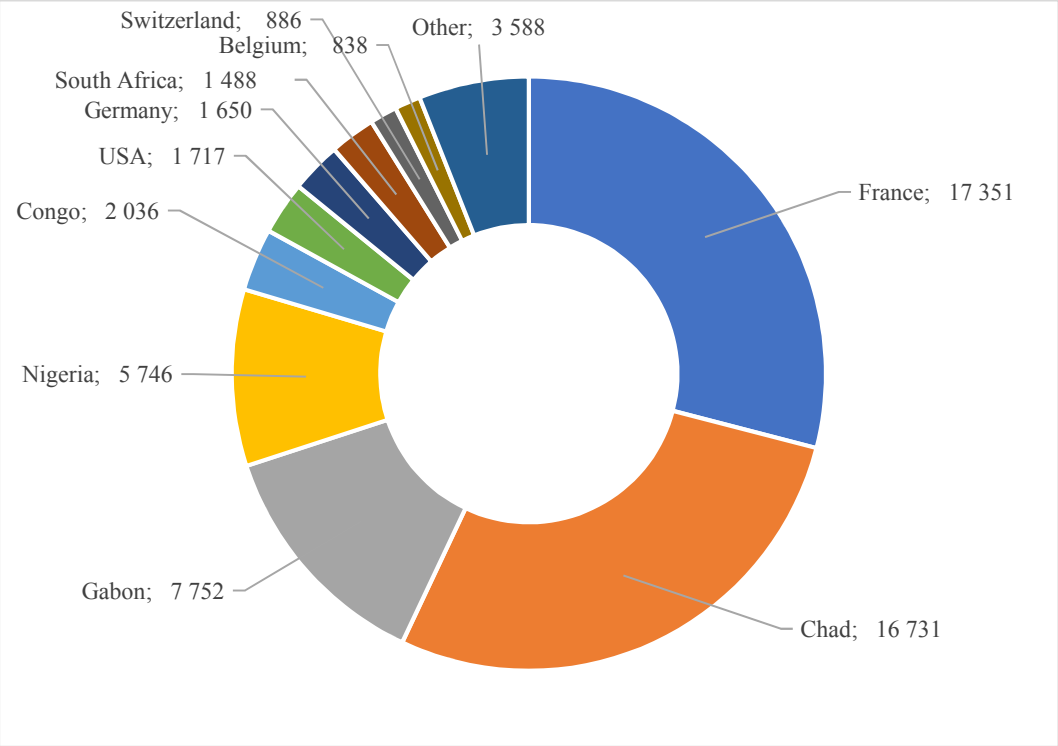
4. Descriptive statistics

This section presents stylized facts about migration and remittances in Cameroon. A summary description of migrants' characteristics is also provided, as well as descriptive evidences on the potential impacts of migration and remittances on some development outcomes.

4.1. Profile of international migration and remittances in Cameroon

According to official statistics from the United Nations Department of Economic and Social Affairs (UNDESA), in 2015 the total stock of Cameroonian migrants was estimated at 59,737[2]. The first destination of Cameroonian migrants is the country's former colonizer France (17,351 migrants or 29.05% of the total stock of migrants) as shown in Figure 1. The Figure also shows that after France, the most important destinations of Cameroonian migrants are neighboring countries such as Chad (16,731 or 28.01%), Gabon (7,752 or 12.95%) and Nigeria (5,746 or 9.62%). These statistics are in accordance with the fact that the majority of African migrants remain within the continent, where borders can be crossed with minimal if any formalities, as noted by Bakewell (2007).

Figure 1: Stock of Cameroonian migrants around the world – 2015

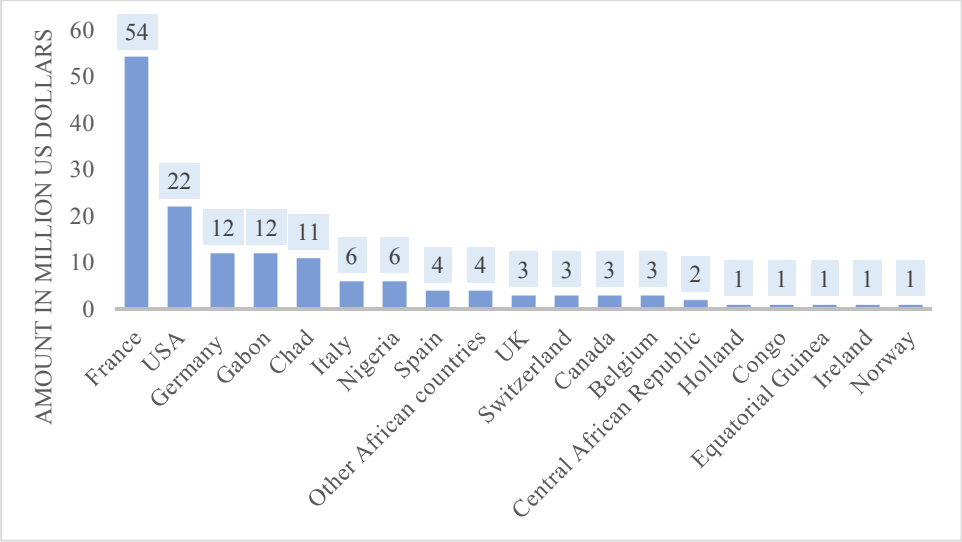


Source: Author's construction based on UNDESA's (2015) data

Looking at the remittances inflows to Cameroon (Figure 2), the highest amounts come from the North. According to official statistics from the World Bank's migration and remittances database, in 2011, the first origin of remittances inflow to Cameroon was France (54 million US dollars), followed by the US (22 million US dollars).

[2] Of course, this estimation does not include irregular migrants

Figure 2: Remittances inflows to Cameroon by origin – 2011



Source: Author's construction based on World Bank's (2011) data (www.worldbank.org/prospects/migrationandremittances)

Moreover, there are many Cameroonian living in neighboring countries such as Gabon and Nigeria, who are working there and who send remittances back home. For instance, in 2011 remittances inflows from Gabon and Nigeria amounted 12 and 6 million US dollars respectively.

4.2. Summary description of migrants' characteristics

Before exploring the potential relationship between migration and remittances and household welfare and labour market participation, it is important to describe key migrants' characteristics, since this can suggest some determinants of migration. As shown in Table 1, absent migrants are generally young (their average age is 32 years), and out of ten absent migrants at least six are males. Looking at the level of education of migrants prior to their departure, more than half (53.69%) had a secondary level of education. This suggests that young Cameroonian generally migrate to study abroad. This is confirmed by the fact that prior to the departure, 52% of absent migrants were at school. Looking for better job opportunities can also be a pushing factor, as 25.38% of migrants were self-employed prior to the departure, while only 9.63% were wage earners. On average, absent migrants have spent five years abroad, and 52% more than five years (Table A1 in Annex). Meanwhile, most of them (52.79%) were living in an African country by the time of the survey.

As far as return migrants are concerned, they are a bit older than absent migrants (37 years old on average), and 78.12% are males. A close look at the data suggests that there might be two categories of return migrants. There might be a group of well-educated individuals, engaged in

wage employment, and travelling abroad for trainings or missions. Indeed, 22.64% of return migrants were wage earners prior to the departure. Besides, the second category may include unskilled individuals (with no or primary education), or those engaged in self-employment, who migrate to look for better opportunities abroad. For return migrants, the length of migration refers to the last time they have migrated (as some of them have migrated several times), and on average return migrants have spent 2.34 years abroad.

Table 1: Migrants characteristics

Items	Absent migrant	Return migrant
N	**592**	**332**
Average age (years)	31.83	37.38
Gender =Male (%)	60.90	78.12
Education attainment (%): before departure for absent, current education for returnees		
No education/Primary	26.98	35.89
Secondary	53.69	46.79
University	19.33	17.31
Relationship with the household head		
Household head	---	65.48
Spouse	2.86	8.42
Son/Daughter	38.00	16.24
Nephew/Niece	7.96	2.16
Brother/Sister	26.69	5.09
Brother or Sister in law	6.90	0.25
Other	17.59	2.36
Duration of migration (years)	5.36	2.34
Occupation before departure (%)		
At school	52.38	25.15
Self-employed	25.38	38.99
Wage earner	9.63	22.64
Unemployed	10.92	7.85
Unpaid work/Retired	1.69	5.37
Arear of residence = Africa	52.79	85.46

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

It is also important to note that gender, level of education and labour market participation status have appeared to be potential determinants of migration. Having presented the main characteristics of migrants, we now move on to analyze the potential impacts of migration and remittances on some development outcomes in Cameroon.

4.3.Developmental impacts of migration and remittances: stylized facts

This section is devoted to a description of households' characteristics and expenditures behaviors, as well as to an exploration of the pattern of monetary and non-monetary poverty, all this with regards to the migration and remittances status. An analysis of the labour market participation status is also included.

- **Households characteristics and expenditures behaviors**

Table 2 displays summary statistics on households' migration status and on their main characteristics. The data set counts 1,235 households, of which 453 (or 36.68%) have an absent migrant, and 294 (23.80%) a return migrant. For 83.45% of households with absent migrant, the migrant resides in an African country. In addition, the average number of absent migrants per household is 1.33 for households with absent migrant, while the average number of return migrants per household is 1.07 for households with return migrants. Among households with absent migrant, the household head is generally older (47.86 years) than in households with return migrant (43.52 years) or without migrant (42.18 years).

Regarding expenditures, households with migrants generally spend more than those with no migrant, in terms of total expenditures, health, nutrition or education expenditures. However, the share of monthly expenditures allocated to food is lower for households with absent migrants (41.22%) as compared to those with return migrants (43.96%) or without migrants (44.09%). When considering the share of education expenditures, households with absent migrants also seem to allocate a slightly higher share of their budget to education related expenditures. These statistics suggest that households with migrants may be wealthier than their counterparts without migrants. This makes sense since migration is costly.

Moreover, having an absent migrant does not necessarily leads of reception of remittances by the household. Indeed, 52.82% of households with absent migrants received remittances in the past 12 months prior to the survey, while this percentage is 8.94% for households with return migrants. This can be explained by the fact that some household members migrate as students, and start sending remittances after a certain time.

Table 2: Summary statistics on households' migration and remittances status and some development outcomes

Variables	Household migration status			Household remittances status	
	Absent migrant	Return migrant	No migrant	With remittances	Without remittances
N	**453**	**294**	**546**	**242**	**993**
Household characteristics					
Average number of absent migrants	1.33	0.20	--	1.41	0.24
Average number of return migrants	0.13	1.07	--	0.14	0.31
Average household size	4.89	4.80	4.65	4.93	4.67
Average number of employed members	1.59	1.68	1.40	1.55	1.50
Av. numb. of members over 15 with primary education	0.86	0.86	0.86	0.83	0.85
Av. numb. of members over 15 with sec. education	1.77	1.55	1.38	1.97	1.44
Av. numb. of members over 15 with univ. education	0.36	0.43	0.22	0.41	0.29
Location=urban area (%)	73.81	78.27	71.10	70.27	74.51
Average number of children under 5	0.50	0.61	0.76	0.42	0.69
Average number of elderly	0.18	0.10	0.72	0.20	0.09
Household head characteristics					
Females (%)	23.61	14.27	22.26	27.13	20.72
Married (%)	72.74	76.01	69.16	75.81	70.53
Average age	47.86	43.52	42.18	48.90	43.05
Education (%)					
No education/primary	43.38	41.02	52.32	41.49	47.30
Secondary	42.68	40.93	38.17	45.51	39.57
University	13.94	18.05	9.52	13.00	13.13
Expenditures/capita (F CFA)					
Total (monthly)	66,289	77,411	45,723	74,460	55,604
Health (monthly)	4,316	2,982	3,795	4,478	3,618
Food (weekly)	5,208	5,557	3,458	5,342	4,390
Education (Yearly)	49,699	41,833	27,694	44,414	35,522
Expenditures as share of monthly expenditures (%)					
Food	41.22	43.96	44.09	40.80	43.73
Health	7.02	5.40	7.30	6.41	6.86
Education	7.49	6.17	6.37	7.72	6.38

Receives remittances (%)	52.82	8.94	--	--	--
Destination of the migrant=Africa (%)	83.45	--	--	--	--
Remittances as a share of HH expenditures (%)	20.65	4.55	--	--	--
District migration rate (average)	12.09	10.06	9.14	11.63	10.04

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

These remittances represent 20.65% of recipient households' monthly expenditures for house with absent migrant, and 4.55% for those with return migrant. Remittances constitute an additional source of revenue which directly contributes to households' expenditures. Remittances recipient households generally have higher monthly per capita expenditures than non-recipient ones. They also allocate less of their budget on food expenditures, and more on education expenditures than their non-recipient counterparts. Migration and remittances may then contribute to human capital accumulation through investment in education.

The remittances sent by migrants in the past 12 months prior to the survey amounted to an average of FCAF[3] 609,824 per migrant (see Table 3). Some destinations such as Europe or America are more lucrative than others (such as Africa), because of the exchange rate advantage, but also because there are more job opportunities in the North, even for unskilled migrants. Our data show that on average, migrants residing in the North remitted an amount of FCFA 766,940, against an amount of FCFA 435,903 for those residing in Africa. Moreover, on average a household received FCFA 723,278.

Table 3: Average amount of remittances

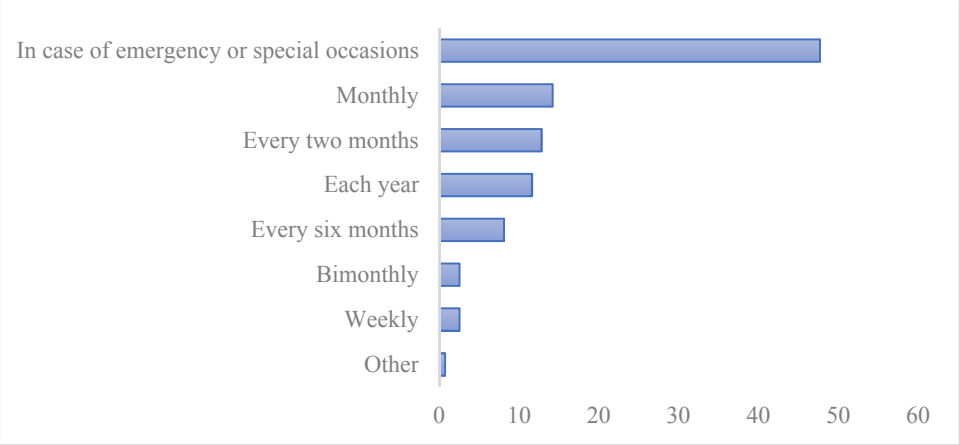
Average amount of remittances	Area of residence of the migrant		
	South	**North**	**All**
Amount transferred per migrant	435,903	766,940	609,824
Amount received by the migrant's household	502,719	909,328	723,278

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

The survey also collected information on how frequently migrants sent remittances in the past 12 months prior to the survey. As shown in Figure 3, 48% of migrants send remittances in case of emergency or special occasions.

Figure 3: Remittances' frequency



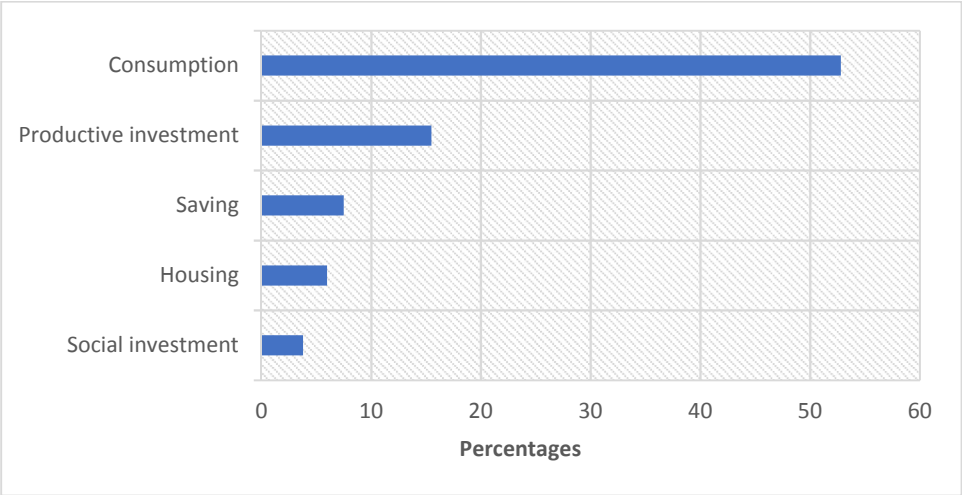
Source: Author's computation using data from the SIMDC 2012

[3] 1 FCFA=655 euros

This trend highlights the fact that remittances constitute a diversification or risk coping strategy. Besides, 14% and 13% of migrants send remittances on a monthly and bimonthly basis respectively.

Households were also asked how they used the money received from the migrants. Results are reported in Figure 4, and show that remittances are mainly allocated to household consumption expenditures (52.8%). Besides, 15.5% of remittances received are allocated to family productive investments, and 6% to housing.

Figure 4: Utilization of remittances by recipient households



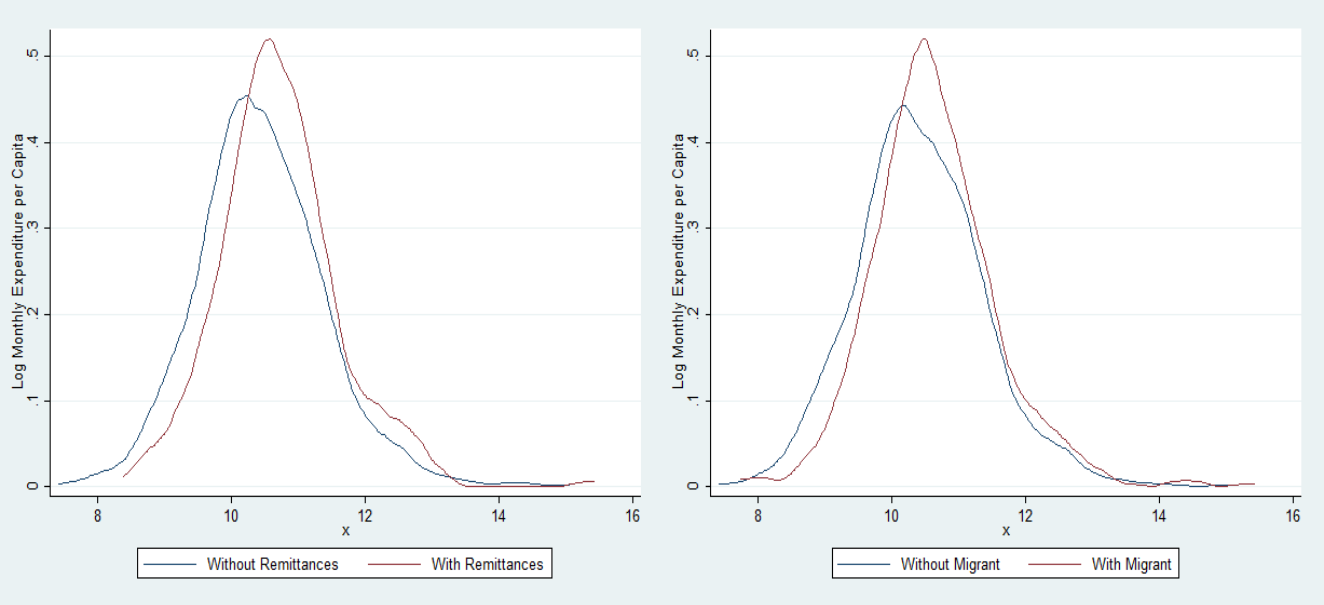
Source: Author's computation using data from the SIMDC 2012

We move on to explore the potential relationship between migration and remittances and income poverty.

- **Migration, remittances and income poverty**

Figure 5 presents the kernel density estimates of household's per capita monthly expenditures according to the migration and remittances status. The density curve for households with absent migrants (respectively receiving remittances) lies to the right of the one for households without absent migrants (respectively not receiving remittances), meaning that households with absent migrants or receiving remittances generally have higher monthly per capita expenditures as compared to their counterparts without absent migrants or not receiving remittances.

Figure 5: Kernel density estimates of households' monthly per capita expenditures



Source: Author's computation using data from the SIMDC 2012

To further explore the potential relationship between migration and remittances and income poverty, we calculate Foster-Greer-Thorbecke (FGT) poverty indicators according to the migration and remittances status. It is worth noting that the poverty line is not available in the data set we are using for our analyses. Consequently, we make use of the 2012's PPP poverty line of 1.90 USD.

Table 4: Income poverty indicators according to the migration and remittances status (%)

Poverty indicators	**Migration status**			**Remittances status**	
	Absent migrant	**Return Migrant**	**Without migrant**	**Receive remittances**	**Do not receive remittances**
Poverty headcount ratio	37.59	37.62	53.91	29.94	47.62
Poverty gap	15.01	14.75	24.71	12.65	20.45
Severity of poverty	7.76	7.75	14.46	6.97	11.42

Source: Author's computation using data from the SIMDC 2012

According to the 1.90 USD PPP poverty line considered, the poverty headcount ratio is 37.59% for households with absent migrant, 37.62% for those with return migrant and 59.91% for those with no migrant. It is then evident that there is at least 16-percentage points difference in the poverty headcount ratio between households with migrant and those without migrant. Inequality of poverty indicators are also higher for households without migrant. A similar pattern is observed when we consider the remittances status. Indeed, the poverty incidence is 29.94% for households receiving remittances, and 47.62% for non-recipient households (or a

17-percentage points difference), and inequality of poverty indicators are higher for non-recipient households. It is also worth noting that the poverty headcount ratio for households receiving remittances is 7-percentage points lower than the one for households with migrant. This is in accordance with the fact having a migrant member does not necessarily lead to reception of remittances by the household.

- **Migration, remittances and non-monetary poverty**

We also investigate the potential relationship between migration and remittances and non-income poverty, measured using four composite indicators, the Composite Welfare Index (CWI), the Productive Assets Index (PAI), the Consumer Assets Index (CAI) and the Utility Services Index (USI) as defined in Section 2. Scoring factors as well as summary statistics of the variables entering the computation of the welfare measures are reported in Table 5.

The scoring factors (in (a) and (d)) are used as weights to aggregate the different variables into the indexes of interest. The values in (a) are used for the overall welfare index, while those in (d) are used for the sub-indexes. Meanwhile, the mean values (in (b), (e), (f), (g) and (h)) represent the summary statistics of the variables entering the computation of the welfare indicators. We also performed a t-test to compare the mean values across households with and without migrants, as well as across remittances recipient households and non-recipient ones.

Considering assets ownership according to the migration status (columns (e) and (f)) and especially consumer ones, it appears that households with migrants are generally wealthier than those without migrants. The same pattern also holds true as far as access to basic utility services is concerned. However, when it comes to productive assets ownership, the opposite is observed for ownership of livestock and business. The pattern of households' assets ownership and access to basic utility services according to the remittances status is the same as the one observed for migration.

Before describing households' non-income poverty, let us first provide some comments on the construction of the welfare indicators. The percentage of information explained by the first principal component is respectively 18.22% for the Composite Welfare Index, 23.19% for the Consumer Assets Index, 36.31% for the Utility Services Index, and 31.36% for the Productive Assets Index (Tables A2 to A5 in Annex). Those tables also show that adding one more principal component does not significantly increase the percentage of information explained. Besides, the values of the Kaiser-Meyer-Olkin measures of sampling adequacy (Table A6 in Annex) are in general above 0.5, guaranteeing that the data are suitable for PCA analysis.

Table 5: Scoring factors and summary statistics of the variables entering the computation of the welfare indicators

	Overall households						Migrant	No migrant	Remittances	No remittances
	(a) Scoring factors	(b) Mean	(c) Std.dev	(d) Scoring factors (sub-indexes)			(e) Mean	(f) Mean	(g) Mean	(h) Mean
				Consumer	Utilities	Productive				
Indicators of consumer durable goods										
Fan	0.241	0.410	0.492	0.264			0.403	0.414	0.332	0.429***
Air conditioner	0.136	0.047	0.212	0.177			0.057	0.041*	0.062	0.043*
TV	0.340	0.780	0.414	0.350			0.852	0.739***	0.859	0.761***
Video player	0.337	0.654	0.476	0.366			0.757	0.595***	0.801	0.618***
Radio	0.257	0.580	0.494	0.284			0.641	0.545***	0.660	0.561***
Computer	0.251	0.199	0.400	0.298			0.257	0.166***	0.295	0.176***
Parabolic antenna	0.263	0.367	0.482	0.293			0.438	0.326***	0.423	0.353**
Fridge	0.304	0.373	0.484	0.356			0.449	0.330***	0.444	0.356**
Washing machine	0.072	0.013	0.113	0.090			0.015	0.011	0.021	0.011
Water heater	0.193	0.166	0.372	0.229			0.177	0.150	0.187	0.161
Gas cooker	0.292	0.510	0.500	0.324			0.635	0.437***	0.643	0.477***
Oil cooker	0.065	0.438	0.496	0.059			0.409	0.454*	0.448	0.435
Electric cooker	0.115	0.040	0.197	0.129			0.033	0.045	0.029	0.043
Improved fired	0.021	0.391	0.488	0.021			0.349	0.416*	0.332	0.406**
Bike	0.021	0.108	0.311	0.041			0.082	0.124**	0.087	0.114
Motorbike	0.054	0.196	0.397	0.072			0.179	0.206	0.170	0.202
Car	0.214	0.132	0.339	0.259			0.168	0.111***	0.170	0.123**
Generator	0.075	0.048	0.213				0.055	0.043	0.066	0.043*
Indicators of access to basic utility services										
Electricity	0.283	0.852	0.355		0.566		0.903	0.823***	0.884	0.845*
Domestic natural gas	------	0.440	0.496		0.475		0.507	0.401***	0.506	0.424**
Potable water	0.172	0.785	0.411		0.401		0.834	0.757***	0.809	0.779
Sanitation system	0.129	0.225	0.418		0.121		0.265	0.202***	0.261	0.216*
Mobile phone	0.236	0.904	0.294		0.528		0.958	0.873***	0.975	0.887***
Indicators of productive assets										
> 1 hectare land	0.026	0.678	0.467			0.524	0.734	0.656***	0.751	0.660***
Sewing machine	0.093	0.100	0.301			0.156	0.117	0.091*	0.116	0.097*
Livestock	-0.067	0.164	0.307			0.584	0.126	0.185***	0.133	0.171*
Agricultural equipment	-0.084	0.403	0.491			0.591	0.429	0.389*	0.477	0.386***

Source: Author's computation using data from the SIMDC 2012

We now move on to describe households' non-income poverty according to the migration and remittances status (Table 6). Households with absent migrants and those receiving remittances are better ranked in terms of Composite Welfare Index, Consumption Assets Index and Utility Services Index than their counterparts with no migrant or not receiving remittances. The difference in those mean welfare indexes is significant at the 1% level. As far as the Productive Assets Index is concerned, the difference is significant only when reception of remittances is considered as treatment.

Table 6: Non-income poverty indicators (Average values)

Poverty indicators	Migration status		Remittances status	
	With Absent migrant	Without absent migrant	Receive remittances	Do not receive remittances
Composite Welfare Index (CWI)	0.51***	-0.29	0.53***	-0.13
Consumer Assets Index (CAI)	0.42***	-0.24	0.47***	-0.11
Utility Services Index (USI)	0.30***	-0.17	0.27***	-0.67
Productive Assets Index (PAI)	0.05	-0.03	0.14**	-0.03

Source: Author's computation using data from the SIMDC 2012
Note: Significance level: ***(1%) **(5%) *(10%).

- **Migration, remittances and labour market participation**

We move on to investigate household heads' labour participation according to the migration and remittances status. Migration can affect occupational choices through several channels, as pointed out by Giulietti et al. (2013). Indeed, remittances received by households with absent migrants may provide the required capital to set-up a business. However, migration of a member can deprive the household of manpower or entrepreneurial skills, or remittances received by the household can provide the family with the means to live without the need of extra earnings (Giulietti et al., 2013).

As shown in Table 7, the share of wage earners is slightly higher (31.10%) for households with absent migrant, as compared to those with return migrants (28.42%) and without migrant (27.89%). Meanwhile, households with return migrants and non-migrant ones exhibit higher self-employment rates (55.65% and 53.73% respectively) when compared to those with no migration experience. Returns migrants may have accumulated experience or have saved money, and are then more likely to be entrepreneurs. It is also worth noting that the unemployment rate is higher for households with absent migrants (10.49%) and without

migrants (10.60%) as compared to their counterparts with return migrants (6.43%). Regarding the remittances status, we also see that the share of self-employed household heads is far away higher for non-recipient households (53.62% against 32.49% for recipient households).

When return migrants set-up a business, there may be spillover effects in the sense that they can employ other family members or members of the community. It can be seen in Table 7 that individuals living in households with return migrants exhibit higher self-employment rates (42.04%) when compared to their counterparts living in households with absent migrants (36.79%) or in non-migrant households (37.75%).

Table 7: Labour market participation according to the migration/remittances status (%)

Status on the labour market	Migration status			Remittances status	
	Absent migrant	Return Migrant	Without migrant	Receive remittances	Do not receive remittances
Household level (N)	**453**	**294**	**546**	**242**	**993**
Wage earner	31.10	28.42	27.89	34.04	28.66
Self-employed	42.69	55.65	52.73	32.49	53.62
Unemployed	10.49	6.43	10.60	12.20	9.12
Unpaid work	3.42	2.95	5.96	4.18	4.43
Retired	12.31	6.55	2.82	17.08	4.17
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
Individual level (N)	**1,239**	**823**	**1,379**	**644**	**2,591**
Wage earner	18.50	16.30	15.55	20.77	16.53
Self-employed	36.79	42.04	37.75	33.42	39.21
Unemployed	31.13	27.58	30.11	30.74	29.36
Unpaid work	8.53	11.23	15.09	8.61	12.85
Retired	5.05	2.85	1.50	6.46	2.06
Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

This descriptive analysis has shown that migration and remittances can have a potential poverty reducing effect. However, migration and remittances may not necessarily lead to the accumulation of productive assets, which is crucial when engagement into entrepreneurial activities is concerned. Meanwhile, receiving remittances seems to reduce the incentive of being self-employed. We also learned that having a migrant member does not necessarily lead to the reception of remittances by the household, and that it is worth to consider household's remittances status as treatment when investigating the impact of migration on development outcomes in Cameroon. In the next section, we perform economic regressions in order to empirically investigate the effects of migration and remittances on household's welfare and labour market participation (self-employment).

5. Presentation of the results

In this section, we first present the results on the effects of migration and remittances on monetary poverty. Next, results on the effects on welfare from a non-monetary perspective are presented, followed by the results regarding the effects on labour market participation (self-employment).

5.1. Effects of migration and remittances on income poverty

To investigate the effects of migration and remittances on income poverty, we adopted the Instrumental Variables (IV) approach. As discussed in Section 2, for the method to be valid, the variable used as instrument (Z) should be highly correlated with the treatment variable (migration or remittances), but not correlated with the unobserved characteristics that affect the outcome variable Y. Hence, Z should satisfy the following two conditions: (i) $Cov(Z, Treat) \neq 0$ (Instrument relevance) and (ii) $Cov(Z, \varepsilon) = 0$ (Instrument exogeneity).

Results from the first stage regression are displayed in Table A7 (in Annex) and show that in both migration and remittances equations, the district migration rate is highly significant (at the 1% level) and has a positive coefficient. The district migration rate seems to be highly correlated with the presence of an absent migrant in the household: the related coefficient is 0.02 in the migration equation, while it is 0.01 in the remittances equation. Meanwhile, exogeneity of the instruments is generally difficult to test. Since we have only one instrument, the models are just-identified. In case there where more than one instrument, we could have used an overidentification test. However, there are post-estimation tests that can be used to assess the IV validity. In this regard, we performed two tests to assess the endogeneity of the treatment variables (migration and reception of remittances) and the weakness of the instrument (district migration rate). Outputs are reported in Table 8. The null hypotheses of exogeneity of the treatment variables are rejected for all the equations (the p-values are all less than 5 percent), meaning that the treatment variables are endogenous. Moreover, the null hypotheses of instrument weakness are also rejected at the 5 percent level.

We move on to comment the second step estimation results which are reported in Table 8. In columns (1) and (2), migration is used as treatment variable, while in columns (3) and (4) the treatment variable is reception of remittances. In addition, in columns (1) and (3), the dependent variable is the log of monthly per capita expenditures, whereas in columns (2) and (4) it is the poverty status (in monetary terms).

Table 8: IV regression results – Second stage

VARIABLES	(1) Log (Per Cap Exp)	(2) Poor	(3) Log (Per Cap Exp)	(4) Poor
Absent Migrant	**0.48****	**-0.26*****		
	(0.194)	**(0.107)**		
Remittances			**0.98*****	**-0.55****
			(0.419)	**(0.236)**
HH size	-0.14***	0.06***	-0.13***	0.05***
	(0.013)	(0.007)	(0.014)	(0.008)
HH head female	-0.04	-0.01	-0.10	0.03
	(0.075)	(0.038)	(0.097)	(0.050)
HH head's age	-0.02**	0.01*	-0.02**	0.01*
	(0.009)	(0.005)	(0.010)	(0.005)
Square of HH head's age	0.02*	-0.01	0.02**	-0.01
	(0.009)	(0.005)	(0.010)	(0.005)
HH head married	-0.06	0.03	-0.10	0.05
	(0.066)	(0.033)	(0.075)	(0.038)
HH head education: Secondary	0.04	-0.00	0.07	-0.02
	(0.062)	(0.037)	(0.065)	(0.038)
HH head education: University	0.21**	-0.03	0.31***	-0.08
	(0.107)	(0.050)	(0.117)	(0.060)
HH head self-employed	0.15***	-0.04	0.23***	-0.09**
	(0.059)	(0.034)	(0.077)	(0.046)
HH head wage earner	0.18***	-0.05	0.22***	-0.07*
	(0.067)	(0.037)	(0.075)	(0.042)
Number of household members over age 15 with primary school	0.02	-0.01	0.02	-0.01
	(0.023)	(0.014)	(0.024)	(0.015)
Number of household members over age 15 with secondary school	0.02	-0.01	-0.00	0.00
	(0.020)	(0.012)	(0.025)	(0.015)
Number of household members over age 15 with university	0.17***	-0.09***	0.13**	-0.07***
	(0.047)	(0.021)	(0.051)	(0.024)
Urban area	0.06	-0.05	0.10	-0.07*
	(0.059)	(0.032)	(0.064)	(0.035)
Composite Welfare Index	0.17***	-0.07***	0.16***	-0.07***
	(0.015)	(0.008)	(0.016)	(0.008)
Constant	11.24***	0.12	11.20***	0.13
	(0.204)	(0.112)	(0.226)	(0.120)
Observations	1,218	1,218	1,218	1,218
Adjusted R-squared	0.36	0.23	0.30	0.17
Wald test for model significance	647.35 (p=0.00)	710.04(p=0.00)	616.02 (p=0.00)	637.56 (0.00)
Endogeneity test				
Durbin (Score) Chi2	6.30 (p=0.01)	4.07 (p=0.04)	5.90 (0.01)	4.26 (0.04)
Wu-Haussman F	6.34 (p=0.01)	4.13 (p=0.04)	5.94 (0.01)	4.35 (0.04)
Instruments weakness test				
Fisher	80.86 (p=0.00)	80.86 (p=0.00)	25.03 (0.00)	25.03 (0.00)

Note: Null hypothesis for endogeneity test: Variables are exogenous. Null hypothesis for instruments weakness test: Instruments are weak. Robust standard errors in parentheses.
Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

The main determinants of per capita expenditures are the household size, household head characteristics such as age, education and labour market participation status, as well as human

capital availability in the household. We also included the Composite Welfare Index as explanatory variable in the regressions. The results show a strong correlation between the index and the two dependent variables. More so, the welfare index is positively related to the expenditures per capita, and negatively to the likelihood of being poor. Interestingly, our variables of interest, namely "having an absent migrant" and "reception of remittances" are highly significant and have the expected sign.

Having an absent migrant member or reception of remittances increases the expenditures per capita and reduces the likelihood of being poor. It is also worth noting that the impact of remittances on expenditures and on poverty seems to be higher than the impact of migration. Indeed, in the expenditures equation, the coefficients of the "remittances" and "migration" variables are 0.98 and 0.48 respectively, whereas in the poverty status equation, these coefficients are respectively -0.55 and -0.26. It is then evident that considering migration as treatment leads to underestimate the effects on poverty. This result makes sense, since having an absent migrant does not necessarily imply reception of remittances (about 40% of households with absent migrant do not receive remittances).

Meanwhile, in the previous regressions we adopted the classical IV approach, in which OLS regression is used in the first and second steps. However, the poverty status is a binary variable, as well as the potential endogenous variables (households' migration and remittances status). We then resort to the Conditional Mixed-Process (CMP) framework, which allows to estimate a two-stages model with endogenous regressor, and to specify the estimation method for each step (OLS or Probit). The related results are reported in Table 9. The first step regression results (using the Probit specification) are not reported, because the determinants of migration and remittances are analyzed in the next subsection. As shown in Table 9, the results are consistent with those obtained using the classic IV regression. Indeed, we still find that having an absent migrant member or receiving remittances increases the per capita expenditures and reduces the likelihood of living below the poverty line. More so, the impact of remittances on expenditures and on poverty remains higher than the impact of migration. In fact, in the expenditures equation, the coefficients of the "remittances" and "migration" variables are 0.83 and 0.45 respectively, whereas in the poverty status equation, these coefficients are respectively -0.31 and -0.20.

Table 9: CMP regression results – Second stage

VARIABLES	(1) Log (Per Cap Exp)	(2) Poor	(3) Log (Per Cap Exp)	(4) Poor
AbsentMigr	**0.45*** **	**-0.20*** **		
	(0.138)	**(0.068)**		
Remittances			**0.83*** **	**-0.31*** **
			(0.230)	**(0.077)**
HHsize	-0.14***	0.05***	-0.13***	0.05***
	(0.012)	(0.01)	(0.013)	(0.007)
HH head female	-0.03	-0.01	-0.07	0.001
	(0.069)	(0.035)	(0.070)	(0.036)
HH head's age	-0.02**	0.01*	-0.02**	0.01**
	(0.009)	(0.004)	(0.010)	(0.004)
Square of HH head's age	0.02*	-0.01	0.02**	-0.007
	(0.009)	(0.004)	(0.010)	(0.004)
HH head married	-0.06	0.03	-0.09	0.04
	(0.065)	(0.032)	(0.064)	(0.032)
HH head education: Secondary	0.04	-0.00	0.07	-0.01
	(0.062)	(0.034)	(0.063)	(0.034)
HH head education: University	0.21*	-0.04	0.29***	-0.07
	(0.106)	(0.057)	(0.112)	(0.058)
HH head self-employed	0.15***	-0.04	0.21***	-0.06**
	(0.056)	(0.031)	(0.070)	(0.032)
HH head wage earner	0.18***	-0.04	0.21***	-0.049
	(0.066)	(0.035)	(0.072)	(0.035)
Number of household members over age 15 with primary school	0.02	-0.01	0.02	-0.01
	(0.023)	(0.014)	(0.023)	(0.013)
Number of household members over age 15 with secondary school	0.02	-0.01	0.00	-0.00
	(0.020)	(0.011)	(0.022)	(0.011)
Number of household members over age 15 with university	0.17***	-0.09***	0.14***	-0.08***
	(0.047)	(0.025)	(0.049)	(0.026)
Urban area	0.06	-0.03	0.09	-0.04
	(0.059)	(0.029)	(0.065)	(0.029)
Composite Welfare Index	0.17***	-0.06***	0.17***	-0.06***
	(0.014)	(0.008)	(0.014)	(0.007)
Constant	11.25***		11.23***	
	(0.204)		(0.214)	
Sig	**-0.28*** **		**-0.26*** **	
	(0.033)		**(0.042)**	
Rho	**-0.33*** **	**0.34** **	**-0.56*** **	**0.47** **
	(0.119)	**(0.166)**	**(0.220)**	**(0.197)**
Wald test for model significance	1003.77 (p=0.00)	710.04(p=0.00)	997.01 (p=0.00)	388.09 (0.00)
Observations	**1,218**	**1,218**	**1,218**	**1,218**

Note: For the Probit regressions, marginal effects are reported. Robust standard errors in parentheses.
Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

5.2. Effects of migration and remittances on non-monetary poverty

To investigate the effects of migration and remittances on non-monetary poverty, we resort to the Propensity Scores Matching (PSM) approach to compare the welfare indexes calculated in the previous section across migrant and non-migrant household, as well as across remittances recipient and non-recipient ones. The first step in the PSM is to estimate the probability of being treated (having an absent migrant or receiving remittances). The probit regression results are displayed in Table 10. The reception of remittances is mainly determined by household head characteristics such as age, gender, level of education, marital status, labour market participation status, as well as household demography (especially the number of children under five). As highlighted by Anderson (2014), education can be considered as a proxy for household wealth and is therefore expected to have a positive correlation with migration and reception of remittances since international migration is costly and poor households are less likely to send migrants abroad. According to our results, reception of remittances is positively correlated with secondary education, while the coefficient on the university level is not significant (recall that no education or primary education is used as reference category). There seems to be an inverted-U relationship between education and reception of remittances. Indeed, less educated households are poor and are less capable of sending migrants abroad than their counterparts with higher levels of education, while those with the highest levels of education are wealthier and do not necessarily receive remittances. Exploration of the data shows that among households receiving remittances, 41.49% of household heads have no education or just have primary education, 45.51% secondary education, whereas 13% have a university level of education.

Moreover, a household head being involved in an income generating activity (paid work or self-employment) is negatively related to the probability of receiving remittances. Meanwhile, we found household head's age to be positively related to the probability of receiving remittances, even though the effect is of very low magnitude. Besides, having a female as household head increases the probability of receiving remittances, whereas reception of remittances decreases with the number of children under five. For households headed by females, generally the husband has migrated, or the women is widowed. In the first case, the husband sends remittances regularly to take care of the family, while in the second case the migrant members send remittances to support their siblings. Meanwhile, having children under five is supposed to increase the dependency ratio and hence increase the need for remittances. However, we found a negative correlation between the number of children under five and reception of

remittances. This can be explained by the fact that having children under five not only reduces the number of members available for migration, but also reduces the parents' incentive to migrate. We also included the district migration rate in the regression, and this variable appears to be positively related to the reception of remittances.

Table 10: Determinants of migration and reception of remittances (Probit specifications)

VARIABLES	(1) Remittances	(2) Migration
HH head age	0.00***	0.00***
	(0.001)	(0.001)
HH head female	0.15***	0.17***
	(0.029)	(0.036)
HH head education: Secondary	0.05**	0.08***
	(0.025)	(0.029)
HH head education: University	-0.01	0.04
	(0.036)	(0.042)
HH head married	0.08***	0.09***
	(0.029)	(0.036)
HH head self-employed	-0.10***	-0.06*
	(0.026)	(0.032)
HH head wage earner	-0.03	-0.01
	(0.030)	(0.037)
HH size	0.00	0.01**
	(0.005)	(0.006)
Number of children under 5	-0.03**	-0.05***
	(0.014)	(0.016)
Number of elderly	0.00	0.026
	(0.031)	(0.040)
Urban area	-0.03	-0.01
	(0.026)	(0.032)
District migration rate	0.01***	0.02***
	(0.002)	(0.002)
Observations	1,218	1,218
Pseudo R-squared	0.11	0.13

Note: Marginal effects are reported. Standard errors in parentheses.
Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

We move on to analyze the determinants of having at least one migrant member in the household. As shown in Table 10 (column 2), the main determinants of receiving remittances are also those of having a migrant member, except the fact that household size is significant in the migration equation and has a positive coefficient. Looking at the coefficients' levels of significance, the most important determinants are household head characteristics such as age, gender, education, marital status; household demography (number of children under five) and the district migration rate. Household head being employed reduces the probability of having a migrant member, but the coefficient is significant at the 10% level. A similar correlation was found by Anderson (2014), who explained that household head being employed reduces the

probability of having a migrant who send remittances but is positively related to the probability of having a migrant who does not send remittances.

The PSM results (ATT effects) are reported in Table 11. Three matching method are used for robustness purposes, namely the Nearest Neighbor (NN) matching, the kernel matching as well as the radius matching. The STATA command used (*psmatch2*) allows to check if the balancing property is satisfied, and to impose the support condition before the matching. The balancing property was satisfied, and the propensity scores graphs (Figure A2 in annex) show that the common support condition was also satisfied.

Table 11: Effects of migration and remittances on non-income poverty

	Migration			Remittances		
	Neighbor	**Kernel**	**Radius**	**Neighbor**	**Kernel**	**Radius**
Composite Welfare Index	0.310**	0.378***	0.395***	0.495***	0.475***	0.510***
	(0.144)	(0.121)	(0.137)	(0.187)	(0.155)	(0.147)
Consumer Assets Index	0.296**	0.360***	0.370***	0.481***	0.471***	0.495***
	(0.140)	(0.122)	(0.120)	(0.169)	(0.158)	(0.138)
Utility Services Index	0.160*	0.172**	0.194***	0.199**	0.183**	0.217***
	(0.086)	(0.073)	(0.071)	(0.096)	(0.085)	(0.083)
Productive Assets Index	0.070	0.072	0.075	0.141	0.145	0.147
	(0.092)	(0.076)	(0.084)	(0.108)	(0.092)	(0.090)

Note: Significance test is based on bootstrap (300 replications). For the neighbor matching, the number of neighbors is 5. For the radius matching, the value of the caliper is 0.1. Bootstrap standard errors in parentheses. Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

As shown in Table 11, the Average Treatment Effect on the Treated (ATT) is positive and significant for the different welfare indicators, except for the Productive Assets Index where the ATT is not significant. It is then evident that migration and remittances have a positive and significant effect on consumer assets ownership, as well on access to basic utility services. However, there seems to be no effect on productive assets ownership. A similar result has been found by Anderson (2014) for the case of Ethiopia. Two reasons can be mentioned to explain this result. The first one is related to the fact that remittances are mainly allocated to household consumption (52.8%). The second argument is that though migration and remittances do not significantly affect productive assets ownership, there might be a significant effect if we consider accumulation of assets over time.

Unfortunately, this argument cannot be tested since our data does not contain retrospective information on all the assets variables. Nevertheless, for some assets such as land, the data contain information on the size of land owned by the household five years prior to the survey. When looking at changes in the size of land owned (Table A9 in annex), it appears that on average, for households with absent migrant and those receiving remittances the size of the land owned has increased by 16.46 and 36.07 hectares respectively, while for the non-migrant and

non-recipient counterparts, there has been a decrease of 17.69 and 14.94 hectares respectively. This suggests that migrant and recipient households are more capable to accumulate productive assets, while their non-migrant and non-recipient counterparts even sell part of the asset they own.

5.3. Effects of migration and remittances on self-employment

Migration and remittances constitute an input that may affect households' labour participation decision. To investigate the effects of migration on self-employment, we used a recursive triprobit model, while a bivariate probit with endogenous regressor (following the CMP approach) has been used to investigate the effects of remittances. As a preliminary step, we estimate univariate probit models, without controlling for the potential endogeneity or selectivity issues. The related results are reported in Table 12. Columns (1) and (2) show the bivariate correlation between migration, remittances and self-employment. The triprobit estimation results of the effect of migration on self-employment are reported in columns (3), (4) and (5). Column (3) is related to the probability of being self-employed, while columns (4) and (5) contain the selection equations. Besides, columns (6) and (7) display the probit estimation results of the effect of remittances on self-employment.

The bivariate correlation (columns (1) and (2)) highlights a positive association between living in a household with return migrants and self-employment on the one hand, and a negative association between living in a household with absent migrants or receiving remittances and self-employment on the other hand. When controlling for individual, household and district level characteristics, and accounting for the selectivity issue, the same result still holds true. Controlling for all these factors (columns (3) and (6)) even yields to substantially higher effects for the case of return migration and remittances, while the coefficient on the absent migrant variable is not significant.

The positive effect of return migration on self-employment can be explained by the fact that returnees have accumulated human capital (entrepreneurial skills for e.g.) or physical capital which enables them to set-up a business. Regarding the negative effect of remittances on self-employment, it is possible that migration deprives households of manpower or entrepreneurial skills, or that remittances received by the household provide the family with the means to live without the need of extra earnings, as pointed out by Guilietti et al. (2013). Meanwhile, the fact that remittances are mainly allocated to household consumption can also explain the insignificance of their effect on self-employment. It is important to note that there are 338 individuals in our sample who live in households where there are both absent and return

migrants. Nevertheless, as noted by Guilietti et al. (2013), the triprobit regression enables to model groups which are not mutually exclusive. We have performed a regression with an interaction term of the return migrant and absent migrant variables, to capture the cross-effect for the 338 individuals who have both absent and return migrants in the household. The coefficient of the interaction variable (0.26) is positive and significant at the 5% level, suggesting that the "positive" effect of return migration on self-employment is larger than the "negative" effect of being a left-behind.

The correlation between self-employment and absent migration equations (Rho 12 in column (3)) is not significant, confirming the fact that living in a household with an absent migrant does not play a significant role in the decision of being self-employed. However, having a return migrant in the household plays a role in the decision of being self-employed, given that the correlation between self-employment and return migration equations (Rho 13 in column (4)) is significant.

Table 12: Probalility of self-employment – Probit, biprobit and triprobit regressions

	Univariate probit		Triprobit			Biprobit	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	Prob(SE=1)	Prob(SE=1)	Prob(SE=1)	Prob(AM=1)	Prob(RM=1)	Prob(SE=1)	Prob(Remit=1)
Main dependent variables							
Absent migrant	-0.03*		-0.12				
	(0.016)		(0.141)				
Return migrant	0.05***		0.97***				
	(0.017)		(0.271)				
Remit		-0.07***				-1.25***	
		(0.019)				(0.231)	
Individual characteristics							
Age			0.17***			0.16***	
			(0.015)			(0.017)	
Square of age			-0.20***			-0.19***	
			(0.020)			(0.023)	
Female			-0.23***			-0.16***	
			(0.055)			(0.050)	
Household head			0.28***			0.23***	
			(0.068)			(0.073)	
Married			-0.09			-0.11**	
			(0.055)			(0.050)	
Education=Secondary			-0.31***			-0.21***	
			(0.058)			(0.060)	
Education=University			-1.13***			-0.89***	
			(0.105)			(0.140)	
Household characteristics							
Household size			-0.01	0.05***	0.04***	0.01	0.02
			(0.010)	(0.009)	(0.010)	(0.009)	(0.010)
N. elderly			-0.12*	0.13	0.08	-0.00	0.16*
			(0.068)	(0.085)	(0.094)	(0.075)	(0.087)
N. children under 5			0.04	-0.22***	-0.05*	-0.02	-0.19***
			(0.029)	(0.029)	(0.028)	(0.033)	(0.036)
Location=Urban			-0.02	-0.08	0.14**	-0.05	-0.19***

			(0.066)	(0.060)	(0.065)	(0.063)	(0.064)
Household head characteristics							
Age				0.05***	-0.03***		0.07***
				(0.011)	(0.013)		(0.010)
Square of age				-0.03***	0.03**		-0.06***
				(0.012)	(0.014)		(0.011)
Female				0.43***	0.01		0.37***
				(0.075)	(0.087)		(0.113)
Education=Secondary				0.25***	-0.06		0.32***
				(0.051)	(0.053)		(0.053)
Education=University				0.13*	0.34***		0.13*
				(0.074)	(0.078)		(0.077)
Married				0.26***	0.07		0.16*
				(0.070)	(0.076)		(0.087)
Employed				-0.07	0.35***		-0.53***
				(0.074)	(0.095)		(0.071)
District level & selection variables							
District unemployment rate			-0.05***	0.00	-0.01	-0.05***	-0.00
			(0.010)	(0.008)	(0.009)	(0.010)	(0.008)
District migration rate				0.07***			0.03***
				(0.005)			(0.008)
DestSouth					0.31***		
					(0.079)		
Constant			-3.22***	-2.84***	-0.68***	-2.67***	-2.74***
			(0.253)	(0.250)	(0.263)	(0.335)	(0.311)
Observations	3,695	3,695	3,626	3,626	3,626	3,666	3,666
			Rho12	Rho13	Rho23	Rho12	
Corr. between equations			0.17	-0.50**	-0.20***	0.99***	
			(0.106)	(0.218)	(0.037)	(0.353)	

Note: SE: Self-employment, AM= Absent migrant, and RM=Return migrant. Robust standard errors in parentheses.
Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

As for the other covariates in the regressions, they are in line with previous studies on self-employment (Guulietti et al. (2013) for e.g.). There is an inverted-U relationship between age and self-employment; males are more prone to be self-employed than females, marital status and education are negatively related to the probability of being self-employed. The negative effect of education and marital status can be explained by the fact that in the context of Cameroon, married individuals or the most educated ones generally look for more secured jobs, and prefer to work as wage earners in the public or private sectors. We even noticed that only 17.31% of returnees have a university level of education. Meanwhile, self-employment is less likely to occur in districts with poor economic conditions. In fact, the district unemployment rate, which is a proxy for district's economic conditions, is negatively related to the probability of being self-employed.

We explored the data to identify the sectors in which self-employed households operate (Table 13). It appears that left-behind households are more involved in wholesale and retail (41.21%).

Indeed, some absent migrants generally send secondhand items to their families, which are sold in junk shops all over the country. This activity is very lucrative, as those secondhand goods are sometimes bought at a cheap price abroad. The second activity in which households with absent migrants are engaged is agriculture (19.72%). We also note that 12.03% of this category of households are involved in transportation and warehousing, which is also an activity related to importations of goods.

Table 13: Sectors of activity of self-employed households

Sectors of activity (%)	HH with absent migrant	HH with return migrant
Agriculture	19.77	15.70
Wholesale and retail	41.21	23.98
Restaurant	17.56	24.18
Transportation and warehousing	12.03	9.88
Real estate	4.22	7.62
Fabrication	1.13	4.66
Health and social services	0.69	4.79
Electricity, water and gas and waste management	1.49	4.09
Information and communication	---	1.79
Others	1.90	3.31
Total	**100.00**	**100.00**

Source: Author's computation using data from the SIMDC 2012

As far as households with return migrants are concerned, they are more engaged in restaurant (24.18%), wholesale and retail (23.98%) and agriculture (15.70%). Some of these households are engaged in fabrication (4.66%), health and social services (4.79%), and in electricity, water, gas and waste management (4.09%). It is worth to note that many Cameroonians travel to African countries to study in technical schools in the field of medicine, hydraulic, architecture, etc. When they graduate, they come back home and work as wage earners, or set-up a business. Activities developed by these returnees have higher economic development prospects than wholesale and retail activities in which left-behind households are involved. However, these entrepreneurs are generally constrained by financial resources availability.

6. Conclusion and policy recommendations

This study aimed to explore the effects of migration and remittances on households' welfare and self-employment in Cameroon. The study adopted as theoretical background the New Economics Labour Migration (NELM) theory. The data used for the analyses were gathered from the survey on the impact of migration on development in Cameroon conducted in 2012 by the Observatory on Migration of the African Caribbean Organization, in collaboration with the Institute of Demographic Research and Training. The data set counts 1,235 households, of which 453 (or 36.68%) have an absent migrant, and 294 (23.80%) a return migrant. For 83.45% of households with absent migrant, the migrant resides in an African country.

De descriptive exploration of the data showed that having an absent migrant does not necessarily leads to reception of remittances by the household. Indeed, 52.82% of households with absent migrants received remittances in the past 12 months prior to the survey, while this percentage is 8.94% for households with return migrants. These remittances represent 20.65% of recipient households' monthly expenditures for house with absent migrant, and 4.55% for those with return migrant. Remittances recipient households generally have higher monthly expenditures per capita than non-recipient ones. They also allocate less of their budget on food expenditures, and more on education expenditures than their non-recipient counterparts. Migration and remittances may then contribute to human capital accumulation through investment in education.

To further investigate the impact of migration and remittances on household welfare, we used the Principal Component Analysis to construct an asset index combining 26 assets variables capturing ownership of household consumer goods (TV, washing machine, radio, etc.), productive assets (land, agricultural equipment, livestock, etc.), and access to basic utility services (potable water, electricity, sanitation, etc.). The welfare index was also broken down into three sub-indexes capturing ownership of household consumer goods, ownership of productive assets and access to basic utility services. Remittances can indeed reduce income poverty in the short run, but if remittances help household accumulating productive assets, diversifying their income sources through entrepreneurial activities, then a significant poverty reduction effect in the long run will be possible.

Making use of robust identification strategies to handle the endogeneity and selectivity issues, the study finds that having a migrant member or receiving remittances increases the households' per capita expenditures, and reduces the likelihood of living below the poverty line. In addition, migration and remittances contribute to the accumulation of consumer assets, to access to basic

utility services, but do not significantly affect productive assets ownership. Besides, self-employment is more likely to occur in households having a return migrant, while receiving remittances decreases the probability of being self-employed. Meanwhile, the effect of the presence of absent migrants in the household on self-employment decision is negative but insignificant. Our results are in line with findings emerging from the related literature. Our findings also suggest that when exploring the migration-development nexus in Cameroon, it is worth considering reception of remittances as treatment variable, rather than having a migrant member.

Our findings also have important policy implications. Indeed, the Government of Cameroon is currently implementing the Growth and Employment Strategy Paper, which aims to improve households living conditions and create job opportunities, among others. Findings from the current study suggests that a well-articulated and well-managed migration and remittances policies can help the Government achieving these development objectives, and thus support policies and actions toward the creation of the enabling environment that fosters the contribution of migration to the country's development. These policies/actions include improvement of the business environment, implementation of entrepreneurial programs targeting return migrants. Moreover, the study suggested that activities developed by returnees have higher economic development prospects than wholesale and retail activities in which left-behind households are involved. However, these entrepreneurs are generally constrained by financial resources availability. Government intervention is also required to implement relevant financing schemes to support these entrepreneurs. Though remittances are privately sent to households, actions can be taken to incentivize recipients to further allocate the funds received to productive investments.

There is also the need to collect more data on migration. Since the National Institute of Statistics conducts each five year a Living Standard Survey, the section on migration could just be further detailed to capture information such as the migrant's country of destination, the amount of remittances received and how these remittances are used. There is also the need to collect detailed information on internal migration. The availability of these data on several years will allow a more robust investigation of the developmental impacts of migration and remittances in Cameroon, making use of panel or pseudo-panel data techniques.

This study has some limitations that are worthy to mention. First, we found that migration and remittances do not significantly affect productive assets ownership, but there might be a significant effect if we consider accumulation of assets over time. Unfortunately, this argument

could not be tested since our data does not contain retrospective information on the assets variables. Meanwhile, the success of return migrants depends on several factors of which the most important are the level of preparation and the economic conditions back home. Only a qualitative study can help understanding migrants' experiences abroad, why they decided to return, as well as the challenges they faced when they returned. Consequently, this quantitative investigation should be complemented by a qualitative study, to shed more light on the channels through which migration and remittances affects households' welfare and self-employment decision.

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Annex

Table A-1: Length of migration (%)

Number of years	Absent migrants	Return migrants
0	6.43	28.65
1	11.51	28.66
2	9.64	13.41
3	9.98	5.49
4	10.66	5.79
5 and more	51.78	18
Total	**100**	**100**

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

Table A-2: Eigenvalues for the Composite Welfare Index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	4.7369	2.45388	0.1822	0.1822
Comp2	2.28302	.718076	0.0878	0.2700
Comp3	1.56494	.326258	0.0602	0.3302
Comp4	1.23868	.0615531	0.0476	0.3778
Comp5	1.17713	.0437212	0.0453	0.4231
Comp6	1.13341	.0584745	0.0436	0.4667
Comp7	1.07493	.0550413	0.0413	0.5080
Comp8	1.01989	.0492026	0.0392	0.5473
Comp9	.970691	.052507	0.0373	0.5846
Comp10	.918184	.0308546	0.0353	0.6199
Comp11	.887329	.0534342	0.0341	0.6540
Comp12	.833895	.0232976	0.0321	0.6861
Comp13	.810598	.0391598	0.0312	0.7173
Comp14	.771438	.0289845	0.0297	0.7470
Comp15	.742453	.0509232	0.0286	0.7755
Comp16	.69153	.0342213	0.0266	0.8021
Comp17	.657309	.0380366	0.0253	0.8274
Comp18	.619272	.025959	0.0238	0.8512
Comp19	.593313	.0352962	0.0228	0.8740
Comp20	.558017	.00852136	0.0215	0.8955
Comp21	.549496	.0147547	0.0211	0.9166
Comp22	.534741	.0326148	0.0206	0.9372
Comp23	.502126	.0568342	0.0193	0.9565
Comp24	.445292	.0223441	0.0171	0.9736
Comp25	.422948	.160489	0.0163	0.9899
Comp26	.262459	.	0.0101	1.0000

Source: Author's computation using data from the SIMDC 2012

Table A-3: Eigenvalues for the Consumer Assets Index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	3.94153	2.3354	0.2319	0.2319
Comp2	1.60613	.25519	0.0945	0.3263
Comp3	1.35094	.20092	0.0795	0.4058
Comp4	1.15002	.0727687	0.0676	0.4734
Comp5	1.07725	.132192	0.0634	0.5368
Comp6	.945054	.0393716	0.0556	0.5924
Comp7	.905683	.0784734	0.0533	0.6457
Comp8	.827209	.0315604	0.0487	0.6943
Comp9	.795649	.0790258	0.0468	0.7411
Comp10	.716623	.0739435	0.0422	0.7833
Comp11	.64268	.0205323	0.0378	0.8211
Comp12	.622147	.0321971	0.0366	0.8577
Comp13	.58995	.0185507	0.0347	0.8924
Comp14	.571399	.0492126	0.0336	0.9260
Comp15	.522187	.0817458	0.0307	0.9567
Comp16	.440441	.145314	0.0259	0.9826
Comp17	.295127	.	0.0174	1.0000

Source: Author's computation using data from the SIMDC 2012

Table A-4: Eigenvalues for the Utilities Services Index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.81735	.782735	0.3635	0.3635
Comp2	1.03461	.182446	0.2069	0.5704
Comp3	.852166	.136949	0.1704	0.7408
Comp4	.715216	.134557	0.1430	0.8839
Comp5	.580659	.	0.1161	1.0000

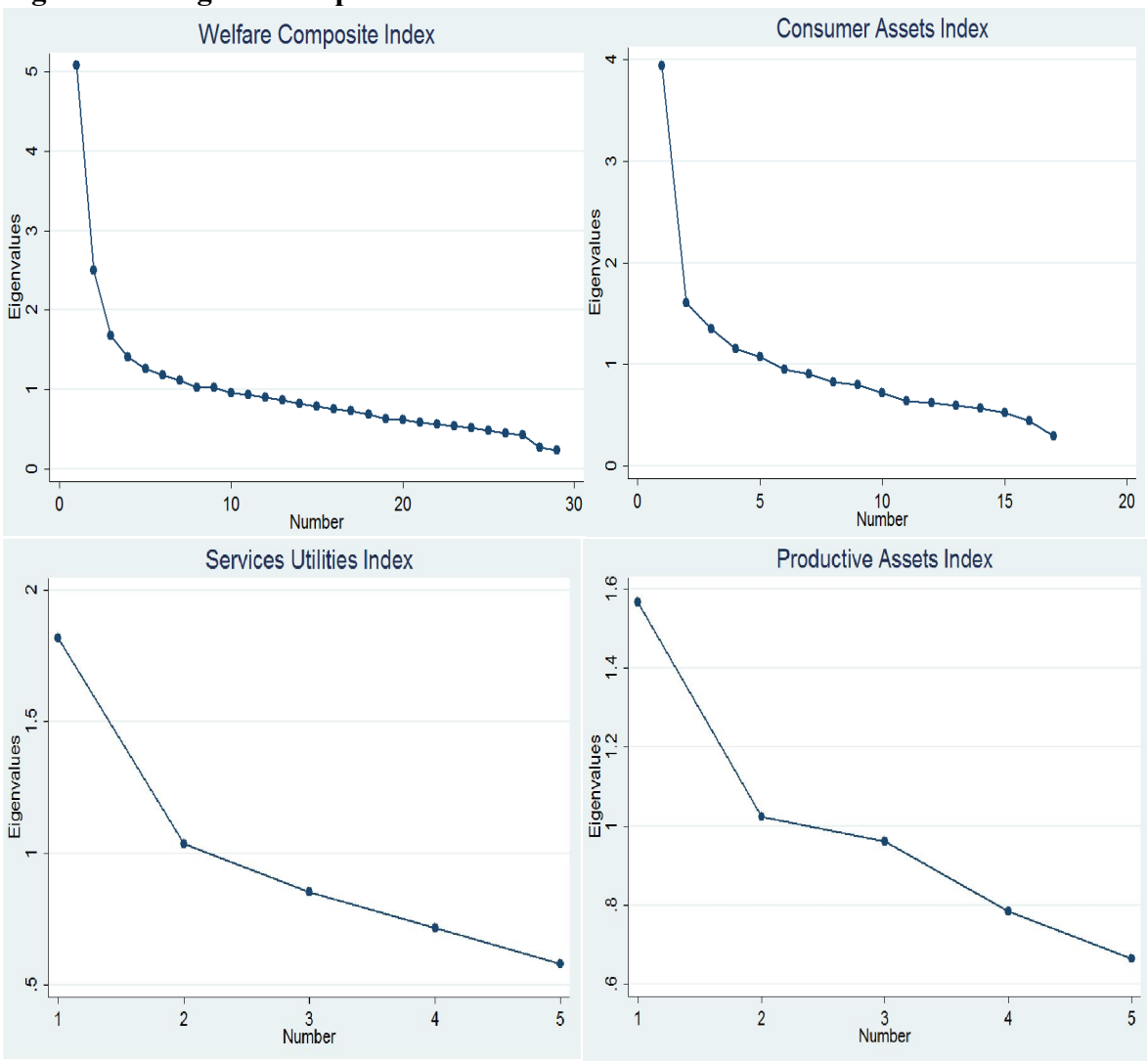
Source: Author's computation using data from the SIMDC 2012

Table A-5: Eigenvalues for the Productive Assets Index

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	1.56781	.543807	0.3136	0.3136
Comp2	1.02401	.0635005	0.2048	0.5184
Comp3	.960505	.175995	0.1921	0.7105
Comp4	.78451	.121343	0.1569	0.8674
Comp5	.663167	.	0.1326	1.0000

Source: Author's computation using data from the SIMDC 2012

Figure A-1: Eigenvalues plots



Source: Author's computation using data from the SIMDC 2012

Table A-6: Kaiser-Meyer-Olkin measure of sampling adequacy

Variables	Composite Welfare Index	Consumer Asset Index	Utilities Services Index	Productive Assets Index
Fan	0.8448	0.8535		
Air conditioner	0.7806	0.7774		
TV	0.8410	0.7983		
Video player	0.8575	0.7988		
Radio	0.8983	0.8860		
Computer	0.8933	0.8568		
Parabolic antenna	0.8993	0.8907		
Fridge	0.8959	0.8574		
Washing machine	0.7454	0.7502		
Water heater	0.8422	0.8151		
Gas cooker	0.8028	0.8747		
Oil cooker	0.5923	0.5450		
Electric cooker	0.6659	0.7338		
Improved fired	0.5689	0.4342		
Bike	0.7068	0.5831		
Motorbike	0.7112	0.6433		
Car	0.8758	0.8513		
Generator	0.7230			
House	0.6563			
Electricity	0.8710		0.6367	
Domestic natural gas	0.7705		0.6926	
Potable water	0.8890		0.7218	
Sanitation system	0.6286		0.5076	
Mobile phone	0.8986		0.6497	
> 1 hectare land	0.6772			0.6579
Business	0.6009			0.6121
Sewing machine	0.7845			0.6287
Livestock	0.7664			0.5968
Agricultural equipment	0.7629			0.5965
Overall	**0.8196**	**0.8215**		**0.6118**

Source: Author's computation using data from the SIMDC 2012

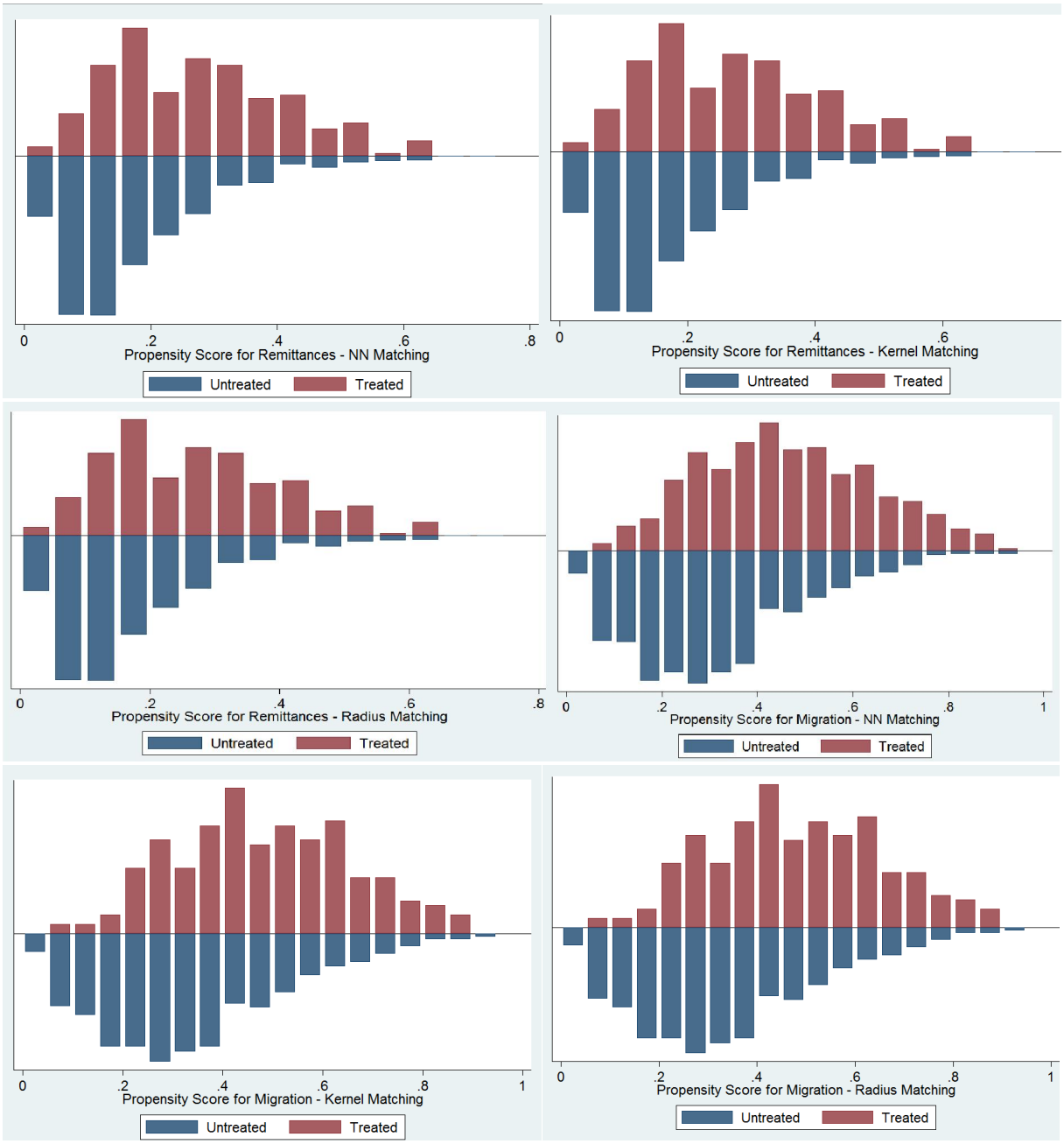
Table A-7: IV regression results – First stage

Variables	Dependent variable (migration status: 1 if HH has an absent migrant, 0 if not)	Dependent variable (remittances: 1 if HH receives remittances, 0 if not)
District migration rate	**0.02*** **	**0.01*** **
	(0.002)	**(0.002)**
HH size	-0.00	-0.01**
	(0.007)	(0.005)
HH head female	0.17***	0.14***
	(0.038)	(0.036)
HH head age	0.01	0.01
	(0.005)	(0.004)
Square of HH head age	-0.00	-0.00
	(0.005)	(0.005)
HH head married	0.07*	0.07**
	(0.035)	(0.032)
HH head education: Secondary	0.03	-0.02
	(0.037)	(0.030)
HH head education: University	-0.02	-0.12**
	(0.058)	(0.050)
HH head self-employed	-0.08**	-0.12***
	(0.034)	(0.030)
HH head wage earner	-0.03	-0.06*
	(0.039)	(0.035)
Number of household members over age 15 with primary school	0.01	0.01
	(0.015)	(0.011)
Number of household members over age 15 with secondary school	0.02	0.03***
	(0.012)	(0.011)
Number of household members over age 15 with university	0.01	0.04
	(0.025)	(0.023)
Urban area	-0.04	-0.06*
	(0.032)	(0.028)
CWI	**0.02*** **	**0.01** **
	(0.007)	**(0.006)**
Constant	-0.15	-0.04
	(0.118)	(0.099)
Observations	1,218	1,218
Adjusted R-squared	0.15	0.10

Note: Robust standard errors in parentheses. Significance level: *** p<0.01, ** p<0.05, * p<0.1

Source: Author's computation using data from the SIMDC 2012

Figure A-2: Propensity Scores graphs



Source: Author's computation using data from the SIMDC 2012

Table A-8: Average changes in land size over 5 years

Variable	Migrant	No migrant	Remittances	No remittances
Average change in land size over 5 years	16.46	-17.69	36.07	-14.94

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data

Table A-9: Summary descriptive statistics on self-employment

Characteristics	Individual self-employed	Individual not self-employed
Individual characteristics		
Average age	35.90	29.19
Female (%)	43.93	53.75
Household head (%)	45.11	22.83
Married (M)	60.77	42.13
Education (%)		
No/Primary	54.65	31.52
Secondary	41.24	55.50
University	4.12	12.98
Household characteristics		
Average household size	5.69	5.94
Average N. elderly	0.09	0.12
Average N. children under 5	0.74	0.61
Location=urban (%)	68.59	77.33
Av. district unemployment rate	3.11	4.29

Source: Author's computation using data from the SIMDC 2012

Note: Calculations used weighted data