Have Migrant Remittances Influenced Self-Employment and Welfare among Recipient Households in Nigeria?

Kabir Kayode Salman

About the Authors

Kabir Kayode Salman is a senior lecturer at the Department of Agricultural Economics, University of Ibadan, Nigeria.

Acknowledgment

Table of Contents

Abstract

Despite a number of studies around the world focusing on the role of remittances in households' livelihood, this topic has not been well documented in Nigeria. To fill this gap, this study examines the influence of remittances on self-employment status and welfare among recipient Nigerian households using data from Migration and Remittances Household Surveys conducted by the World Bank in 2009 and 2010. Results find that remittances decreased the probability of recipients being self-employed by 28.4 percent. In addition, per capita expenditures of recipient households were ₦80,695.25 (equivalent to USD 536.77) compared to ₦35,865.77 for non-recipient households; in other words, recipient households had 92.3 percent higher per capita expenditures than non-recipients. Based on these results, a public enlightenment campaign on the need to invest remittances, trainings to build households' entrepreneurial skills, and supportive government business promotion policies are recommended.

Résumé

Malgré un certain nombre d'études dans le monde se concentrant sur le rôle des envois de fonds dans la vie des ménages, ce sujet n'a pas été bien documenté au Nigeria. Pour combler cette lacune, cette étude examine l'influence des transferts de fonds sur le statut d'auto-emploi et le bien-être parmi les ménages bénéficiaires nigérians en utilisant les données de migration et d'envois de fonds des ménages a partir des enquêtes menées par la Banque mondiale en 2009 et 2010. Les résultats montrent que les envois de fonds diminuent la probabilité d'être en auto-emploi des bénéficiaires de 28,4 pour cent. En outre, les dépenses par habitant des ménages bénéficiaires étaient de 80,695.25 Nairas (équivalent à 536,77 USD) par rapport à 35,865.77 Nairas pour les ménages non bénéficiaires; en d'autres termes, les ménages bénéficiaires avaient des dépenses par habitant 92,3 pour cent plus élevés que les non-bénéficiaires. Sur la base de ces résultats, une campagne de sensibilisation du public sur la nécessité d'investir les fonds transférés, des formations pour développer les compétences entrepreneuriales des ménages, et des politiques de promotion des affaires gouvernementales de soutien sont recommandés.

1.   Introduction

Migration is generally defined as the movement of people from one place in the world to another for the purpose of taking up permanent or semi-permanent residence, usually across a political boundary (National Geographic, 2005). Migration has become a predominant factor in international relationships and a central component of the economic globalization process (Nwaru *et al.,* 2011). The number of regional, national, and international migrants has increased in recent years, with more than 230 million people living outside their countries of birth in 2013 and over 700 million migrating within their countries of birth (World Bank, 2013). Remittances – the transfer of money by a foreign worker to an individual in his or her home country (World Bank, 2011) – are one of the most important outcomes of migration (William *et al.*, 2011) and have also become an important source of income and foreign exchange for many developing countries (Quartey, 2006).

Trends of Remittance in Africa

According to World Bank statistics, about 30 million Africans have migrated internationally. Remittance inflows to the continent have seen a fourfold increase over the past 20 years and were estimated at nearly USD 40 billion, 2.5 percent of the region's GDP, in 2010. The inflow of remittances to Africa exceeds the amount of official aid going to the region and formed the second largest source of net foreign capital inflow after Foreign Direct Investments (FDI) (World Bank, 2011 in Ghosal, 2015). In 2012, for the first time, remittances became Africa's largest external financial source, ahead of FDI and Other Development Assistance (ODA) (African Economic Outlook, 2013). The inflow of remittances more than doubled in Africa south of the Sahara (SSA) between 2005 and 2012, from $9.6 billion to $21.5 billion (World Bank, 2011). Currently, remittance flows are still larger than Official Development Assistance (ODA), and more stable than private capital flows (World Bank, 2016).

As opposed to other developing regions, the majority of SSA has the world's highest share of poverty population and its lowest share of immigrants to developed countries. In 2010, only 24.8 percent of immigrants from SSA went to high-income OECD countries, while only 2.5 percent migrated to high-income non-OECD countries (World Bank, 2011).

Trends of Remittance in Nigeria

Nigeria is the largest economy in Africa and the world's 20th largest economy if GDP is measured in purchasing power parity (PPP). The country is also home to nearly 170 million people (Fitzmaurice, 2014). The World Bank (2013) reports that the top recipients of officially recorded remittances for 2012 were India ($71 billion), China ($60 billion), the Philippines ($26 billion), and Mexico ($22 billion), followed by Nigeria ($21 billion). In 2014, Nigeria was the largest recipient of remittances in SSA, with US$ 22.3 billion, up 1.9 percent from 2013. The World Bank has also predicted increases in remittances to Nigeria in the near future.

From 2000 to 2011, the Nigerian economy experienced the slowest rise in real GDP in Western Africa. During the same period, the country experienced a massive outflow of labor, with some 10 percent of

the population living and working abroad by the end of 2010. Remittances also showed an upward trend during this time.

Nigeria is highly dependent on remittances, with overseas remittances making up a vital source of income for many Nigerian households. Despite the heavy remittances flowing into the country, a number of programs aimed at combating unemployment and other social problems, and the country's economic growth over the past decade, however, Nigeria's economy is still characterized by increasing unemployment rates, poverty, and dwindling household welfare. In 2013, the country's overall unemployment rate was 23.9 percent, while the youth unemployment rate was 38 percent (World Bank, 2013). In this context, cases of armed robbery, hostage-taking for ransom, illicit drug trade and addiction, militancy, and insurgency have become commonly observed.

Given these trends, it is not surprising that over the last decade, the overall welfare of households in Nigeria has been reportedly low (Salman, 2012). Although recent panel surveys indicate that the per capita national poverty rate based on the official poverty line may now be as low as 33.1 percent, a large share of the Nigerian population is still not far above the poverty line (World Bank, 2014).

Theoretically, significant links exist between (1) remittances and employment (including self-employment), (2) remittances and welfare, and (3) remittances and income distribution and economic development as a whole; these links are supported by evidence from around the world (World Bank, 2003). However, not much is known about the recent effect of remittances on household welfare in a high remittance-receiving country like Nigeria. Available studies tend to be based on relatively old data (Olowa, 2013) or conceptual or non-empirical data (Olufemi and Ayandibu, 2014) or focus only on farming populations (Bassey-Etowa *et al.,* 2015) or a particular region of the country (Ogunniyi *et al.*, 2016). To the best of the researcher's knowledge, empirical studies on the impact of remittances on Nigeria's labor supply or on Nigerian households' decision to be self-employed do not yet exist.

This study attempts to fill these gaps in the literature by investigating the effects of migrant remittances on (1) the decision to be self-employed and (2) welfare among the recipient households' in Nigeria. The study also distinguishes itself based on robust estimation procedures used to handle endogeneity and selectivity problems. The remainder of the paper is organised as follows. Section 2 provides a literature review in which the linkages between migrant remittances, self-employment, and welfare are established. An attempt is also made to perform a review of studies across the world, across Africa, and finally, within Nigeria. The third section examines methodology, the data used, and the analytical framework employed. Section 4 contains the results and discussion, while section 5 provides conclusions and policy recommendations.

## 2.	Literature Review

### 2.1	Impact of Remittance on Self-Employment and Welfare

Globally, remittances increase household incomes and are therefore a powerful pre-welfare force in developing countries. Unlike beneficiaries of some publicly funded social safety nets, recipients of remittances can identify their own greatest needs and can allocate the remittance income accordingly. Evidence from around the world shows that households that receive remittances are financially better off across multiple dimensions relative to similar households that do not receive remittances (Anyanwu and Erhijakpor, 2010). Remittance recipients therefore have higher purchasing power, and this could potentially reduce the incidence, depth, and severity of poverty.

### 2.2	Remittances and Self-Employment

Developing countries across the globe are being confronted with a growing young population; this growth brings with it high youth unemployment rates (Junne *et al*., 2015) and the consequential risks of a restless young population. The African Development Bank (2012) estimated that in Africa south of the Sahara, the young population will be a billion strong in the labor market by 2040. Braga (2009) argues that young people's labor market disadvantages are an important policy issue, and that a delay in entry into the workforce has severe implications in terms of poverty, human and social capital depletion, participation in the informal sector, and social instability. Of particular concern is the realization that employment, or lack thereof, has been identified as one of the top reasons for youth migration (FAO, 2013). In other words, migration is seen by young people as a strategy to cope with limited employment opportunities, particularly in rural areas that face a lack of social safety nets and functioning capital markets.

McCormick and Wahba (2001) find that time spent working abroad and total amount of money saved abroad both have a positive and significant effect on the likelihood of a returning migrant becoming an entrepreneur. The role of each component, however, depends on whether or not the migrant in question is literate.

While most remittances are used to pay for family consumption, many migrants also use part of their earnings to set up businesses in their home country (Cotula, 2004; McLoughlin *et al*., 2011). In this regard, Petreski *et al*., (2014) submits that youth in households receiving remittances have a considerably larger probability of establishing their own businesses; similarly, Islam et al (2013) find that remittance-receiving families can improve different growth prospects and promote self-employment activities. In Eastern European countries, Leon-Ledesma and Piracha (2009) find that remittances lower the shadow price of market wages in recipient countries; individuals who receive remittances are expected to reserve a higher wage to enter the labor market.

Okodua (2013) also shows that remittances have a significant contemporaneous positive impact on private investment across the sampled sub-Saharan countries. Bjuggren, *et al.* (2010) reveal that there

is a direct and positive relationship between remittances and investment. They further find that institutional quality and the level of financial development interact inversely with remittances and that, as a consequence, remittances increase investment more in less financially developed countries and in countries where institutional quality is lower. Remittances from international migrants can overcome liquidity constraints that usually block entrepreneurial activities like micro-enterprises and self-employment (Acosta *et al.*, 2007).

The extent of investment or saving of remittances depends on the volume of those remittances, other sources of household income, and spending behavior of both the remitter and his household. The remittances saved in banks and financial institutions can increase credit availability in the remittance-receiving country and can provide financing to entrepreneurs, which in turn can have a positive impact on development. This impact increases when migrants or their household members invest remittances in profitable ventures. When migrants invest, their emotional attachment to their (often marginal) regions of origin can help compensate for the disadvantages of these regions in the eyes of purely profit-seeking investors (Jorgen, 2004). For example, the contribution of migrants from Kerala, a southernmost state in India, to the region's development can be seen in various areas like housing, transportation, town planning, educational and religious institutions, amenities, and other infrastructural facilities (Begum, and Abdul-Azeez, 2005).

Remittances can also improve countries' credit worthiness and thereby enhance their access to international capital markets (Ratha, 2007). Properly accounted currency remittances can improve a country's risk rating, enabling that country to borrow at lower cost in international markets through the securitization of expected remittance flows. In a favorable economic and investment climate, remittances serve as a reliable source of capital for small and medium-sized entrepreneurs, which in turn reduces credit constraints and increases the essence of entrepreneurship, leading to better remittance management. Brown and Richard (1994) state that where proper opportunities arise, remittances are used for investment, thus generating more employment.

2.3   Remittance and Welfare

The literature suggests that foreign remittances help improve welfare in migrant's home country (Andersson, 2012; Adams and Cuecuecha, 2010a; Khan, 2008; Jongwanich, 2007). Specifically, remittances improve the welfare of recipient households either through increased expenditures on basic necessities or through savings and investments (Nwaru *et al.*, 2011). Khawar *et al.* (2014) examines the impact of workers' remittances on household welfare and finds that remittances help the probability of a household being poor; they also increase people's efficiency and productivity, thus increasing their incomes (Iheke and Nwaru, 2008). However, the impact of remittances on welfare at the household level is also conditional on whether the migration has been performed legally or illegally. In the case of illegal migration, migrants find it harder to become active members of the workforce in their host

country. This affects their ability to send remittances back home and halts their ability to raise the income levels of their families (Iqbal, 2013).

Latif and Ashfaq (2013) also examine the impact of remittances on rural economies and finds that monthly expenditures of remittance-receiving households increased by 41 percent and expenditures on food increased by 31 percent. Quartey (2006) investigates the impact of migrant remittances on household welfare in Ghana. The results of the random effects GLS regression model showed that remittances had a positive and significant impact on household welfare and were beneficial for minimizing consumption shocks. Raihan *et al.* (2009) examine the impact of remittances on household welfare in Bangladesh. The results were in the favour of the hypothesis that remittances increased economic growth and reduced poverty in that country. It has also been suggested that remittances improve the health status of children by providing better nutrition and that they can increase birth weight and reduced infant mortality rate. In Mexico, Lopez-Cordova (2006) estimates that a 1 percent increase in remittance share decreased the infant mortality rate by 1.2 percent.

As discussed in the previous sub-section, remittances can help stabilize recipient economies through their capacity to enhance sovereign creditworthiness by increasing the level and stability of foreign exchange receipts (Ratha, 2007; Ratha *et al.,* 2011). Ratha *et al.* (2011) show that the creditworthiness rating score of some developing countries would improve by one to three notches if remittances were accounted in this rating. As credit rating is widely used by African countries, this feature of remittances could be very important, allowing countries easy access to international financial markets to raise the funds required for development projects.

When it comes to spending and investment patterns, Adams and Cuecuecha (2010a) find that households in Guatemala that receive remittances spend more on the margin on education and housing; they also find that remittance-receiving households in Indonesia spend more on the margin on food but less on housing (Adams and Cuecuecha 2010b). Remittances have been found to be useful in agriculture as well. Adams (1998) investigates the impact of internal and international remittances on asset accumulation in rural Pakistan. A positive and significant relationship existed between remittances and two types of physical assets: irrigated- and rain-fed land. Quisumbing and McNiven (2010) assess the impact of internal migration and remittances on assets in rural Philippines using longitudinal data and an instrumental variable approach. The study finds that having large number of migrant children in the household reduces the value of non-land assets.

Although remittances and migration can be very beneficial for recipient households, they also come with some social and economic costs. For instance, remittances increase dependency behavior among recipient households because remittance-receiving households do not have as much interest in labor supply (Meins, 2007). It has also been suggested that remittances can generate idleness among recipient households (Chami *et al.,* 2005). Migration also creates some social problems, such as broken families and fatherless children (Nwaru *et al.*, 2011).

3.   Methodology and Data

3.1   Data

Data from Migration and Remittances Household Surveys conducted by the World Bank for Nigeria between 2009 and 2010 were used in this study. The survey instrument obtained information on a variety of demographic, social, and economic characteristics, such as education, marital status, housing conditions, self-employment status, agricultural land, ethnicity, geopolitical zone, skills, languages, and access to finance. The standardized questionnaire included seven modules that focused on the following: (i) household roster, (ii) housing conditions, (iii) household assets and expenditures, (iv) household use of financial services, (v) internal and international migration and remittances from former household members, (vi) internal and international migration and remittances from non-household members, and (vii) return migration. The data has a national representation with a sample size of 2,251 households.

3.1.1 Some Socio-Economic Characteristics and Self-Employment Status among Recipient and Non-Recipient Households

The descriptive statistics of households' socio-economic characteristics are as presented in Tables 1 and 2. The mean age of household head (54.36 years), years of schooling of household head (10.32 years), and per capita household expenditures (₦80695.25, equivalent to USD 536.771) of the recipient households were all higher than those of non-recipients. It is also noted that the total expenditure and a few of its components were also higher for the recipient households. This could give some preliminary suggestion that the welfare of remittance recipients could be higher than that of non-recipients. The self-employment status across recipient and non-recipient households are displayed in Table 3.

Table 1: Socio-Economic Characteristics of Recipient Households

Variables	Obs	Mean	Std. Dev	Min	Max
Household size	582	5.34	2.91	1	19
Health Expenditure (₦)	582	15919.04	38961.5	0	600000
Age (Years)	578	54.36	13.66	17	101
Age squared	578	3141.32	1507.83	289	10201
Schooling years	582	10.32	5.81	0	26
Per capita Expenditure (₦)	582	80695.25	161993.10	0	1644990
Rent (₦)	582	15248.90	44009.93	0	400000
Business setup (₦)	582	33293.13	264923.5	0	5000000
House land purchase (₦)	582	62245.70	354078.80	0	5000000
Total Expenditure (₦)	582	360906.30	690901.00	0	8224950.00

Source: Author's computation from World Bank data (2009/2010)

---

1 The estimate is as at 2010 when the data was collected. 1 USD = 150.3346 NGN

Table 2: Socio-Economic Characteristics of Non-Recipient Households

Variables	Obs	Mean	Std. Dev	Min	Max
Household size	1669	6.15	3.38	1	24
Health Expenditure (₦)	1669	9030.66	21895.81	0	400000
Age (Years)	1660	47.62	13.32	19	108
Age squared	1660	2444.44	1362.50	361	11664
Schooling years	1669	8.35	5.94	0	25
Per capita Expenditure (₦)	1669	35865.77	86103.73	0	2117250
Rent (₦)	1669	8040.02	31873.24	0	450000
Business setup (₦)	1669	11241.64	75485.50	0	1850000
House land purchase (₦)	1669	19990.42	179132.30	0	4000000
Total Expenditure (₦)	1669	177083	362219.40	0	5603000

Source: Author's computation from World Bank data (2009/2010)

Table 3: Self-Employment Status among Recipient and Non-Recipient Households

Self-Employment Status	Remittance Status		Total Freq (%)
	Recipient Households Freq (%)	Non-Recipient Households Freq (%)	
Self-Employed	317 (14.08)	1057 (46.96)	1374 (61.04)
Non Self-Employed	265 (11.77)	612 (27.19)	877 (38.96)
Total Number	582 (25.86)	1669 (74.14)	2251(100.00)

Source: Author's computation from World Bank data (2009/2010)

3.2 Analytical Tools

The main analytical tool used to assess the impact of remittances on self-employment was the switching probit model; the treatment-effects model was the main tool used to assess the impact of remittances on welfare (household expenditures). Propensity Score Matching (PSM) was also utilized to assess both effects. However, since cross-sectional data were used, comparison of outcome changes between the "treatment" and "control" households using PSM may lead to unreliable estimates. The main models were therefore considered in order to address the issues of selectivity and endogeneity. Descriptive statistics, such as frequency counts, mean, and standard deviation, were also utilized.

3.2.1 PSM

Some households received remittances, while others did not. Hence we cannot observe outcomes for the same households in both states, i.e. treatment and counterfactual. A non-experimental method was therefore employed in the estimation (Rosenbaum and Rubin, 1983). The Average Treatment Effect on the Treated (ATT) was estimated following Propensity Score Matching (PSM).

3.2.1.1 Estimating the Propensity Score (PS)

The propensity score is defined as the conditional probability of receiving a treatment given pre-treatment characteristics. The PSM makes the treated group (those that received remittances) more comparable with the untreated group (those that did not receive remittances) due to the non-random[2]

---

[2]This is also called selection bias

nature of selection. Thus, a control group of untreated households that have similar observable characteristics and that correspond statistically to the treated group is created, using covariates that predict receipt of treatment.

The propensity scores were computed using binary logit regression models, given as:

$$P(X) \equiv Pr\{D = 1/X\} = E\{D/X\}$$

(1)

where D= {0, 1} is the indicator of exposure to treatment characteristics (dependent variable). That is, D=1 if exposed to treatment and D=0 if not exposed to treatment. X is the multidimensional vector of pre-treatment characteristics (explanatory variables).

These explanatory variables are those which are expected to jointly determine the probability of a household receiving remittances and the outcome. By correctly accounting for factors that drive remittance receipts, potential unobserved differences between recipients and non-recipients (i.e. selection bias) are likely to be reduced (Hernandez, 2015). It is also assumed that the probability of receiving remittances has to lie between zero and one. This is referred to as Common Support. The common support assumption implies that for each treated individual, there is another non-treated individual who can be used as a matched comparison observation (Bora *et al.*, 2012).

3.2.1.2 Impact Estimation

The matched sample was used to compute the Average Treatment Effect on the Treated (ATT) to determine the effect of receiving remittances. This is defined by Rosembaum and Rubin (1983) as follows:

$$ATT = E\left(Y^1 - Y^0 / D = 1\right) = E\left(Y^1 / D = 1\right) - E\left(Y^0 / D = 1\right)$$

(2)

where $E\left(Y^1 / D = 1\right)$ is the observed outcome of the treatment, that is, self-employment and welfare status by household that received remittances, and $E\left(Y^0 / D = 1\right)$ is the counterfactual outcome, or the expected self-employment status and extent of welfare households would have attained had they not received remittances. The counterfactual outcome here represents the outcomes of the non-recipient households since they have similar characteristics as recipient households.

3.2.2 Endogenous Switching Probit

The endogenous switching probit model, recently developed by Lokshin and Sajaia (2011), was used to measure the impact of remittances on self-employment status of recipient households due to possible endogeneity and heterogeneity problems associated with remittance data and the PSM method of estimation. The model becomes most applicable in the case of the binary choice with binary endogenous regressors. The model was therefore utilized to estimate the effect of remittances (binary endogenous regressor) on the self-employment decision (binary choice) among the remittance-receiving households. Other similar econometric estimation techniques like bivariate probit (biprobit) and Heckman probit

models are inefficient in this case; for instance, biprobit is restrictive in that it assumes an equality of coefficients in the outcome equations for both treatment regimes. In addition, these approaches require potentially cumbersome adjustments to derive consistent standard errors. The endogenous switching probit model, on the other hand, implements the full information Maximum Likelihood (ML) method to simultaneously estimate the binary selection and the binary outcome parts of the model to yield consistent standard errors of the estimates.

The Endogenous Switching Probit is written thus, following Lokshin and Sajaia (2011) and Sylvie and Li (2012):

$$T_i = \begin{cases} 1 \; if \; \gamma Z_i + \mu_i > 0 \\ \\ 0 \qquad otherwise \end{cases} \tag{3}$$

$$Y_{1i}^* = I[\beta_1 X_{1i} + \epsilon_{1i} > 0] \tag{4}$$

$$Y_{0i}^* = I[\beta_0 X_{0i} + \epsilon_{0i} > 0] \tag{5}$$

where the regime (T_i) is whether the individual household received remittances or not and the (binary) outcome measure (Y_i) is self-employment. Y_{1i}^* (resp. Y_{0i}^*) is the latent variable for the observed binary outcome Y_1 (resp. Y_0) in the recipient households (resp. non-recipient households); Z_i and X_i are vectors of observables generating the selection equation (being a recipient household or not) in equation 3 and the self-employment status in equation 4; μ_i is the error term for the selection equation, ϵ_{1i} and ϵ_{0i} are the regime-specific error terms, and I[.] is the indicator function. The error terms (μ_i, ϵ_{1i}, ϵ_{0i}) are assumed to be jointly normally distributed with zero mean vector and covariance matrix:

$$\Sigma = \begin{pmatrix} 1 & \rho_\mu 1 & \rho_\mu 0 \\ & 1 & \rho_0 1 \\ & & 1 \end{pmatrix} \tag{6}$$

where $\rho_\mu 1$ ($\rho_\mu 0$) is the correlation between the unobserved characteristics predicting remittance μ and self-employment outcome in the remittance-receiving households ϵ_1 (resp. self-employment outcome in the non-recipient households ϵ_0), and ρ_{01} is the correlation between ϵ_0 and ϵ_1. If the ρs are significant, then it is necessary to account for selection in order to ensure unbiased and efficient estimates. In consonance with the studies of Aakvik *et al.* (2005), Lokshin and Glinskaya (2009), and Sylvie and Li (2012), the effect of being a recipient household on the probability of being a self-employed individual with characteristics X = x randomly drawn from the population can be expressed as follows:

$$TE(x) = Pr(Y = 1|X = x) \text{ - } Pr(Y = 0|X = x) \tag{7}$$

$$TT(x) = Pr(Y = 1|T = 1, X = x) \text{ - } Pr(Y = 0|T = 1, X = x) \tag{8}$$

$$TT(x) = \frac{\Phi_2 \left(X_1 B_1, Z_\gamma, \rho_1 \right) - \Phi 2 \left(X_0 B_0, Z_\gamma, \rho_0 \right)}{F(Z_\gamma)} \tag{9}$$

where TE(x) and TT(x) are the Treatment Effect and Treatment Effect on the Treated, respectively. Average TE (ATE) and Average TT (ATT) are therefore generated as the mean values of TE and TT over the sample population. Φ_2 is the cumulative function of a bivariate normal distribution and F is a cumulative function of the univariate normal distribution. The TE(x), TT(x), and Treatment Effect on the Untreated - TU(x) were generated immediately after the endogenous switching probit model was executed.

In a usual probit estimation, receiving remittances or not (as a function of self-employment status) is potentially endogenous due to unobserved household characteristics. There would then be omitted variables correlated with both remittances (which are the 'product' of migration) and self-employment. Hence, remittances would tend to be correlated with the unobserved determinants of self-employment (Petreski *et al.*, 2014). However, instrumental variables like the number of Western Union offices in each region/state and regional migration rates have been recommended by Amuedo-Dorantes and Pozo (2006). The number of banks per state was used in this study (as a proxy for number of Western Union offices) as the instrumental variable for remittance.

3.2.3 Treatment-Effects Model

A treatment-effects model was employed to establish the effects of remittances on household welfare (measured by per capita household expenditure). The treatment-effects model (otherwise known as the endogenous treatment-regression model) considers the effect of an endogenously chosen binary treatment (receipt or no receipt of remittances) on another endogenous, continuous variable (household welfare), conditional on two sets of independent variables. The treatment-effects model is executed by using either a two-step consistent estimator or full maximum likelihood. In treatment-effects, the endogenous binary variable model is a linear potential-outcome model that allows for a specific correlation structure between the unobservables that affect the treatment and the unobservables that affect the potential outcomes[3].

The endogenous treatment-regression model is composed of an equation for the outcome y_j (i.e. household welfare) and an equation for the endogenous treatment t_j (i.e. being a recipient of remittances or not). The variables x_j are used to model the outcome. When there are no interactions between t_j and x_j, we have:

$$y_j = X_j\beta + \delta t_j + \epsilon_j \tag{10}$$

$$t_j = \begin{cases} 1, & if\ w_j\gamma + \mu_j > 0 \\ \\ 0, & otherwise \end{cases} \tag{11}$$

where w_j are the covariates used to model treatment assignment and the error terms ϵ_j and u_j are bivariate normal with mean zero and covariance matrix:

---

[3] See http://www.stata.com/manuals13/teetregress.pdf.

$$\begin{bmatrix} \sigma^2 & \rho\sigma \\ \rho\sigma & 1 \end{bmatrix} \qquad\qquad (12)$$

The covariates x_j and w_j are unrelated to the error terms; in other words, they are exogenous. This is referred to as the constrained model because the variance and correlation parameters are identical across the treatment and control groups.

4.   Results and Discussion

4.1   Impact of Remittances on Self-Employment

4.1.1 Estimate of Impact of Remittance on Self-employment from PSM

The result of the estimate[4] for the impact of remittances on self-employment is presented in Table 4. The effect of remittances on the self-employment of the recipient households was -0.037 (-3.7 percent). By implication, receiving remittances lowers the probability of being self-employed in Nigeria by 3.7 percent. More specifically, these findings provide interesting insights – namely, that recipient households do not invest remittances in businesses and hence do not become self-employed. In fact, this finding provides a strong indication that an increase in remittances discourages active job searches or any job engagement; this finding is consistent with previous studies such as Leon-Ledesma and Piracha (2009) and Ndiaye *et al*. (2015).

Table 4: Average impact estimates of propensity score matching of remittances on self-employment

Variables	Sample	Treated	Control	Difference	t-stat
Self-employment	Unmatched	0.1971	0.1420	0.0551	3.12***
(Kernel matching)	ATT	0.1971	0.2341	-0.0369	-1.32
	ATU	0.1420	0.1530	0.0109	
	ATE			-0.0013	

'*': significant at 10% level; '**':5% level; '***':1% level
Source: Author's computation from World Bank data (2009/2010)

4.1.2 Estimates of Impact of Remittances on Self-Employment – Regression-Based

A more suitable endogenous switching probit was employed, and the result is presented in Table 5. The estimation is simultaneously executed, generating the determinants of receipt of remittance (referred to the selection equation), as well as factors influencing households' self-employment decision (outcome equation). The Wald test was significant; hence, the null hypothesis of $\rho_\mu 0 = \rho_\mu 1$ is hereby rejected. This implies that the model is purged of possible endogeneity problems. As described in the methodology, this implies that unobservables in the selection equation are not apparently correlated with unobservables in the outcome equations. In other words, the unobserved factors that predict a

---

[4] A detailed result of the matching procedure is given in the Appendix.

higher propensity for households to receive remittances do not predict the likelihood of those households' self-employment status. This further proves the efficacy of the instrumental variable considered. Following this validation of the switching model, the ATE, ATT, and ATU were estimated, as shown in Table 6.

Table 5: Impact of remittances on self-employment - endogenous switching probit model

	Remittance (Selection)		Self-employed *with remittance*		Self-employed *without remittance*	
	Coefficients	Robust Stand. error	Coefficients	Robust Stand. error	Coefficients	Robust Stand. error
Personal Characteristics						
Sex	0.1898*	0.1148	-0.2570*	0.1378	0.0458	0.1370
Household size	-0.0107	0.0129	0.0134	0.0158	0.0611***	0.0134
Age	0.0244*	0.0147	0.0081	0.0183	-0.0121	0.0149
Age squared	8.52e-06	0.0001	-0.0004**	0.0002	-0.0001	0.0001
Educational years	0.0349***	0.0063	-0.0853***	0.0118	-0.0848***	0.0113
Married	-0.1605	0.1214	0.1108	0.1450	0.1380	0.1461
Ethnicity						
Yoruba	0.4291***	0.1134	-0.2767*	0.1545	0.2367*	0.1338
Igbo	0.3879***	0.1096	-0.1775	0.1462	0.3218**	0.1253
Hausa	-0.8074***	0.1668	0.6980**	0.3196	-0.4101***	0.1261
Efiki-Ibibio	0.1384	0.1467	-0.2943	0.2421	-0.1830	0.1522
Ijaw	0.5281***	0.1741	-0.4272*	0.2249	0.2256	0.2496
Nupe	-1.0268***	0.3371	7.098	0.1845	-0.5872***	0.1906
Benin-Esan	0.2860 *	0.1590	-0.1165	0.2131	-0.0669	0.1884
Sector						
Urban	-	-	-0.1354	0.0852	-0.2793***	0.0896
Agric. Land Ownership	-	-	0.0324	0.0805	-0.1095	0.0789
Instrumental Variable						
Number of banks per state	1.5x10^{-4}*	5.86x10^{-6}				
Constant	-2.510***	0.4216	2.9729***	0.5042	1.8718***	0.4655
Number of obs	2205					
Log- pseudo Likelihood	- 2266.1044					
Wald chi2	277.84					
Prob> chi2	0.0000					
$\rho_\mu 1$	-0.9360	0.1106				
$\rho_\mu 0$	0.5956	0.2701				
LR test of indep. eqns. (rho1=rho0=0):chi2(2) = 5.18 Prob > chi2 = 0.0751						

'*': significant at 10% level; '**':5% level; '***':1% level
Source: Author's computation from World Bank data (2009/2010)

Table 6: Average treatment effects

Effects	Obs	Mean	Std. Dev.	Min	Max
ATE	2205	0.193	0.1502	-0.1983	0.9367
ATT	565	-0.284	0.1075	-0.6610	0.0902
ATU	1640	0.356	0.2188	0.0120	0.9746

Source: Author's computation from World Bank data (2009/2010)

The ATT was -0.284. This implies that remittances decreased the probability of being self-employed by 28.4 percent among the recipient households. A comparative inference with the PSM is that both estimation procedures actually found that remittances reduce the probability of being self-employed. However, there was an underestimation of the impact in the PSM approach.

4.2 Impact of Remittances on Household Welfare

4.2.1 Estimate of Effect of Remittance on Welfare from PSM

The PSM results depict that remittances improve welfare (ATT) of recipients households compared to the average treatment effect (ATE) for an individual drawn from the overall population at random and ATU (Table 7). The average impact estimation showed a positive impact of remittances on household welfare for all categories of individuals, indicating that ATT has a positive impact and significantly increases households' per capita expenditures (welfare) by 49.36 percent (equivalent to ₦26385.37). The positive influence of remittances on household welfare corroborates the findings of Odior (2014) and Andersson (2012), who both reported that recipient households saw improved welfare compared to non-recipients.

Table 7: Average impact estimates of propensity score matching of remittances on welfare

Variables	Sample	Treated	Control	Difference	t-stat
Welfare	Unmatched	79793.77	35827.52	43966.24	8.14***
(Kernel matching)	ATT	79841.87	53456.50	26385.37 (49.36%)	3.54***
	ATU	37008.08	68365.02	-31356.94	
	ATE			30029.78	

'*': significant at 10% level; '**':5% level; '***':1% level
Source: Author's computation from World Bank data (2009/2010)

4.2.2 Estimates of Impact of Remittances on Household Welfare – Regression-Based

The impact of remittances was measured using a linear regression with endogenous treatment models (treatment effects) in order to achieve efficient estimates. The natural logarithms (ln) of households' per capita expenditures (as a dependent variable) was utilized as a standard approach when modelling the expenditures equation. The results are presented in Table 8. In the OLS, remittances were significant and positively influenced household welfare by 43.7 percent. This suggests that recipient households were able to satisfy their basic needs like education, food, housing, and other utilities better than non-recipient households. In addition, following a priori, increased household size (among other variables) leads to significantly lower welfare standards, while higher educational years significantly increased household welfare. Again, as stated in the methodology, the estimates in treatment effects are regarded as unbiased and more efficient because the model allows for a specific correlation structure between the unobservables that affect the treatment (remittance) and the unobservables that affect the potential outcomes (Welfare). This therefore required a strong consideration of the treatment effects model. The

results are again presented in Table 8. The likelihood-ratio test indicates that the null hypothesis of no correlation between the treatment-assignment errors and the outcome errors is hereby rejected. The estimated correlation between the treatment-assignment errors and the outcome errors, ρ, is -0.294. This negative relationship indicates that unobservables that raise the observed household welfare tend to occur with unobservables that lower the likelihood of a household receiving remittances. The coefficient of remittances (0.923) is now enhanced, indicating a higher impact of remittances (92 percent) on welfare of recipient households. This also implies an underestimation in the OLS and the PSM estimates. In line with the estimation procedures in treatment-effects models, the coefficient of remittance is also the ATE. The ATT is also the same as the ATE in this case because the treatment indicator variable has not been interacted with any of the outcome covariates, and the correlation and variance parameters are identical across the control and treatment groups.

Table 8: Impact of remittances on household welfare

| | **Linear regression** | | **Linear regression with endogenous treatment** | | | |
| | | | Household Welfare: Ln (per capital expenditure) | | Remittance | |
	Coefficient	Robust Stand. error	Coefficient	Robust Stand. error	Coefficient	Robust Stand. error
Personal characteristics						
Sex	-0.1103	0.0891	-0.1398	0.0907	0.1846	0.1182
Household size	-0.0548***	0.0076	-0.0535***	0.0079	-0.0094	0.0159
Age	0.0154	0.0099	0.0142	0.0097	0.0228	0.0154
Age squared	-0.0001	0.0001	-0.0001	0.0001	-3.57e-06	0.0001
Educational years	0.0571***	0.0045	0.0524***	0.0048	0.0376***	0.0066
Married	-0.1046	0.0927	-0.0871	0.0936	-0.1030	0.1251
Ethnicity						
Yoruba	-0.5199***	0.1166	-0.5327***	0.1206	0.2649	0.1837
Igbo	0.0286	0.1122	-0.0052	0.1179	0.2196	0.1718
Hausa	-0.0215	0.1173	-0.0508	0.1172	0.8025**	0.2982
Efiki-Ibibio	0.2091*	0.1202	0.2544**	0.1254	-0.2218	0.1587
Ijaw	-0.3487**	0.1433	-0.3870***	0.1463	0.2502	0.1787
Nupe	-0.0659	0.1649	-0.0607	0.1657	-0.1062	0.4140
Benin-Esan	-0.6097***	0.1188	-0.5968***	0.1189	-0.0078	0.1707
Sector						
Urban	0.6201***	0.0589	0.5998***	0.0578	0.1513*	0.0862
Zone						
North central	0.1066	0.1638	0.1185	0.1661	0.5401	0.4928
North West	-0.3666***	0.1023	-0.3562***	0.1085	0.0899	0.4472
South East	0.4763***	0.1524	0.3862***	0.1631	2.2307***	0.4692
South South	0.6855***	0.1262	0.5567***	0.1379	2.3982***	0.4673
South West	0.5463***	0.1392	0.4188***	0.1525	2.1415***	0.4560
Agric. Land Ownership	0.1180**	0.0510	0.1345**	0.0524	-0.1033	0.0771
Remittance	0.4371***	0.0558	0.9232***	0.1896		
Number of banks per state					0.0002**	0.0001
Constant	8.5687***	0.3017	8.6841***	0.3078	-4.4505***	0.6588
No. of Obs	2198					
R-squared	0.3871					
Log-pseudo Likelihood			-4106.7099			
Wald chi2 (21)			1517.90			
Prob> chi2			0.0000			
Rho			-0.2940	0.1025		
sigma			1.0103	0.0229		
Lambda			-0.2971	0.1078		
LR test of indep. eqns. (rho = 0): chi2(1) = 5.96 Prob> chi2 = 0.0147						

'*': significant at 10% level; '**':5% level; '***':1% level

Source: Author's computation from World Bank data (2009/2010)

Conclusion and Policy Recommendations

Nigeria has experienced heavy inflows of remittances, along with increasing unemployment rates and dwindling household welfare. This paper uses data from Migration and Remittances Household Surveys conducted by the World Bank in 2009 and 2010 in order to investigate the relevance of remittances for recipient households' self-employment status and welfare. Analytical frameworks adopted in the study were propensity score matching (PSM), endogenous switching probit (ESP), and treatment–effects models (TEM). The ESP and TEM were strongly considered in order to control for endogeneity problems associated with remittance data due to unobserved household characteristics. The results showed that household heads in recipient households had higher ages and education levels. Their mean per capita expenditure (₦80695.25, equivalent to USD 536.77) was also higher than that of non-recipient households (₦35865.77). A significant negative impact of remittances on self-employment among recipient households was found; remittances decreased the probability of recipients being self-employed by 28.4 percent. However, remittances had a positive impact and significantly increased the per capita expenditure (welfare) of recipient households by 92.3 over non-recipient households.

This paper concludes that heavy remittance inflows into Nigeria had a negative impact on self-employment decisions among recipient households during the study period; most recipients did not invest the received remittances in income-generating activities. However, recipients' welfare status improved considerably compared to non-recipient households.

Economic insecurity has been increasing in Nigeria in recent years, and this could discourage remittance recipients from investing the funds they receive. Many people may prefer to keep their funds at home or in the bank and to use them solely for satisfying basic household needs or acquiring luxuries. To help solve this problem, investors would need to be motivated with guarantee protection mechanisms.

In addition, education campaigns should be put in place to teach remittance-receiving households about the need to invest remittances in income-generating activities. This would enable remittance recipients to become net employers and to contribute to the national GDP and would also tend to reduce country's unemployment rates. Schools, religious centers, media, and market places could be used to spread the awareness. An enabling policy environment and efficient funding use would also be needed in order to provide trainings on entrepreneurial skills for both recipient and non-recipient households. These goals are in line with the existing federal government emphasis on self-employment pursuits, especially among young graduates.

Remittances have become Nigeria's largest external financial source in recent times, ahead of both Foreign Direct Investment (FDI) and Other Development Assistance (ODA). Policymakers should therefore not underestimate the economic gains to be seen from remittances and should embrace the need for policy initiatives and incentives focusing on improving the use of remittances. For instance, while available data on the value of remittances flowing into the country is officially recorded, other unofficial inflows also exist. The Federal Ministry of Finance and Central Bank of Nigeria should

therefore set necessary machinery in motion to capture these unofficial inflows. This would not only solve remittance data availability issues but would also provide room for effective monitoring on remittance use and impacts on the economy. In addition, as poverty in Nigeria is largely a rural phenomenon and as women are more affected, government policies should specifically support and promote women's investments of remittances in either the rural or the urban sector. Such investments could include land acquisition and opportunities to access loans at low or no interest in order to expand an existing business. This also fits into the federal government's women's empowerment initiatives.

References

Acosta, P., P. Fajnzylber, and H. López. 2007. "The Impact of Remittances on Poverty and Human Capital: Evidence from Latin American Household Surveys." *World Bank Policy Research Working Paper* 4247.

Adams, R.H. 1998 "Remittances, Investment and Rural Asset Accumulation in Pakistan." *Economic Development and Cultural Change* 47: 155-173.

Adams, R.H., and A. Cuecuecha. 2010a. "The Economic Impact of International Remittance on Poverty and Household Consumption and Investment in Indonesia." Policy Research Working Paper Series 5433. Washington DC: The World Bank.

_____. 2010b. "Remittances, Household Expenditure and Investment in Guatemala." *World Development*. Available at doi:10.1016/j.worlddev.2010.03.003

Aakvik, A., J. Heckman, and E.J. Vytlacil. 2005. "Estimating Treatment Effects for Discrete Outcomes When Responses to Treatment Vary: An Application to Norwegian Vocational Rehabilitation Programs." *Journal of Econometrics* 125(1–2):15–51.

African Development Bank Group. 2012. "Youth Employment in Africa: Migration, Remittances and the Informal Sector Highlighted." Available at http://www.afdb.org/en/news-and-events/article/youth-employment-inafrica-migration-remittances-and-the-informal-sector-highlighted-9992/.

African Economic Outlook. 2013. "External Financial Flows and Tax Revenues for Africa." Available at http://www.africaeconomicoutlook.org/en/outlook.

Amuedo-Dorantes, C., and S. Pozo. 2006. "Migration, Remittances, and Male and Female Employment Patterns." *The American Economic Review* 96 (2): 222-226.

Andersson, A. 2012. *Migration, Remittances and Household Welfare in Ethiopia*. Unpublished manuscript, University of Gothenburg.

Anyanwu, J.C., and A.E.O. Erhijakpor. 2010. "Do Remittances Affect Poverty in Africa?" *African Development Review* 22 (1): 51–91.

Bassey-Etowa, E., N.J. Nweze, and C.J. Arene. 2015. "Effects of Migrant Remittances on Farm Household Welfare in Nigeria." *Review of Agricultural and Applied Economics* 18(1): 03-10. ISSN 1336-9261

Begum, M., and K.M. Abudul-Azeez. 2005. "Gulf Migration: It's Economic Impact." Paper presented in National conference. JNNCE, Shimoga.

Bjuggren, P., J. Dzansi, and G. Shukur. 2010. **"**Remittances and Investment." CESIS Electronic Working Paper Series, Paper No. 216. The Royal Institute of Technology.

Bora, C. L. Palma, M.C. González, and L.F. Aguado. 2012. "Evaluation of an Active Labour Market Programme in a Context of High Unemployment." *Desarrollo y Sociedad* 70: 93-115.

Braga, Michela. 2009. "When the Manna Comes from Abroad - Remittances and Youth Labor Market Behaviour in Albania." Paolo Baffi Centre Research Paper No. 2009-41. Available at SSRN: http://ssrn.com.

Brown, P., and P.C. Richard. 1994. "Consumption and Investments from Migrants. Remittances in the South Pacific." Employment Department, International Labour Office, Geneva.

Chami R., C. Fullenkanp, and S. Jahan. 2005. "Are Immigrant Remittances Flows a Source of Capital for Development?" IMF Working Paper WP /03/189.

Cotula, L. 2004. "Exploring the Linkages between Remittances and Access to Land: A Conceptual Framework." Available on: http://www.fao.org/docrep/007/j2815e/ j2815e03.htm.

Dehejia, R. H., and S. Wahba. 2002. "Propensity Score Matching Methods for Non-experimental Causal Studies." *The Review of Economics and Statistics* 84(1):151-161.

Fitzmaurice, M.M. 2014. "Hot Times Ahead: The Effects of Climate Change on Agriculture in Indi and Nigeria." *Global Majority E-Journal* 5(2): 89-103.

Food and Agriculture Organisation. 2013. "Rural Youth and Internal Migration. Inputs to the United Nations World Youth Report 2013– Youth migration and Development." Prepared by the Decent Rural Employment Team, ESW, FAO, March 2013.

Ghosal, S. 2015. "Workers' remittances, one of the reliable sources of capital inflows to Ethiopia – Its performance analysis towards shaping the economic growth". International Journal of Interdisciplinary and Multidisciplinary Studies (IJIMS), 2(6):174-185.

Hernandez, M.A. 2015. "Estimation of Average Treatment Effects. A Training Manual on Applied Microeconometrics." AGRODEP Training Manual.

Hosmer, D.W., and S. Lemeshow. 1989. *Applied Logistic Regression*. New York: John Wiley & Sons, Inc.

Iheke, O., and J. Nwaru. 2008. "Comparative Analysis of the Mean Output of Rice and Profit by Men and Women in Rice Production Systems in Abia State of Nigeria." *Agricultural Journal* 3(2): 147-151.

Iheke, O.R. 2012. "The Effect of Remittances on the Nigerian Economy." *International Journal of Development and Sustainability* 1(2):614–621.

Iqbal, Asif. 2013. "Impact of Foreign Remittances on Household Poverty in Pakistan: Evidence from Household Data." Master Thesis in Economics; UMB School of Economics and Business Norwegian University of Life Sciences.

Islam Sirajul, S. Parvin, and A. Kalam. 2013. "Socio-economic Impacts of International Migration in Bangladesh." *Journal of Economics and Sustainable Development* 4 (4):9-17.

Jongwanich, J. 2007. "Workers' Remittances, Economic Growth and Poverty in Developing Asia and the Pacific Countries." UNESCAP Working Paper WP/07/01, United Nations.

Jorgen, C. 2004. "Policy Options for Increasing the Benefits of Remittances." Paper Presented at the Ninth International Metropolis Conference.

Junne, G. C. A., F.E.W. Knoote, D. Rodima-Taylor, & D. de Winter. 2015. "Youth and Remittances: Implications for Policy." Child and Youth Finance International (CYFI) Network Brief 1.

Khan, M.W.R. 2008. "The Micro Level Impact of Foreign Remittances on Incomes in Bangladesh: A Measurement Approach Using the Propensity Score." Centre for Policy Dialogue Bangladesh Discussion Paper.

Khawar, A., M.S. Hazur, S. Anam, and A. Qamar. 2014. "Impact of Workers' Remittances on Household Welfare in District Jhang (A Case Study of Tehsil 18 Hazari)." *Journal of Finance and Economics* 2(4): 131-135.

Latif, M., and M. Ashfaq. 2013. "An Economic Impact of Remittances in Rural Economy." *Pakistan Journal of Agricultural Sciences* 50(1):147-153.

Leon-Ledesma, M., and M. Piracha. 2009. "International Migration and the Role of Remittances in Eastern Europe." *International Migration* 42: 65–84.

Lokshin, M., and E. Glinskaya. 2009. "The Effect of Male Migration on Employment Patterns of Women in Nepal." *The World Bank Economic Review* 23(3):481–507.

Lokshin, M., and Z. Sajaia. 2011. "Impact of Interventions on Discrete Outcomes: Maximum likelihood Estimation of the Binary Choice Models with Binary Endogenous Regressors." *The Stata Journal* 11(3):368–385.

Lopez-Cordova E. 2006. "Globalization, Migration and Development: The Role of Mexican Migrant Remittances." INTLITD Working Paper 20.

McCormick, B., and J. Wahba. 2001. "Overseas Work Experience, Savings and Entrepreneurship Amongst Return Migrants to LDCs." *Scottish Journal of Political Economy* 48: 164–178.

McLoughlin S., R. Münz, R. Bünte, G. Hultin, W. Müller, and R. Skeldon. 2011. "Temporary and Circular Migration: Opportunities and Challenges." Working Paper No.35, European Migration and Diversity Europe's Political Economy Programmes.

Meins, R. 2007. *Remittances: An Introduction*. Foundation for International Migration and Development.

National Geographic 2005. "What is Human Migration? Human Migration Guide (6-8)." Available at http://www.nationalgeographic.com/xpeditions/lessons/09/g68/migrationguidestudent.pdf.

Ndiaye, A.S., O.K. Niang, Y.C. Ndione, and S.E. Dedehouanou. 2015. "Migration. Remittance, Labour Market and Human Capital in Senegal." Working Paper. Partnership for Economic Policy (PEP).

Nwaru, J., O. Iheke, and C. Onyenweaku. 2011. "Impact of Migrant Remittances on the Welfare of Arable Crop Farm Households in Southeastern Nigeria." *Human Ecology Review* 18: 159-166.

Odior, E.S. 2014. "Remittances and the National Household Disposable Income in Nigeria (1980-2025): Dynamic Forecasting Approach." *British Journal of Economics, Management & Trade* 4(9): 1335-1355.

Okodua, H. 2013. "Migrant Workers' Remittances and Private Investment in Sub-Saharan African Countries." *European Journal of Social Sciences* 36(3): 451-461.

Olowa, O.W. 2013. "The Impact of Migrant Remittances on Household Welfare in Rural Nigeria." *The Social Sciences* 4: 59-64.

Oluwafemi, A., and A.O. Ayandibu. 2014. "Impact of Remittances on Development in Nigeria: Challenges and Prospects." *J Sociology SocAnth* 5(3): 311-318.

Ogunniyi A., K.K. Salman, and K. Olagunju. 2016. "Do Remittance Inflow Improve Household Welfare in Sub-Sahara Africa? Evidence from Nigeria." A paper presented at the "African Globalities – Global Africans" *4th Pecs African Studies Conference, University of Pecs, Hungary on* 10th. June, 2016.

Petreski Marjan, Nikica Mojsoska-Blazevski, MajaRistovska and Edi Smokvarski 2014. "Youth Self-Employment in Households Receiving Remittances in Macedonia." Partnership for Economic Policy (PEP) Working Paper 2014-08.

Quartey, P. 2006. "The Impact of Migrant Remittances on Household Welfare in Ghana." Final report submitted to African Economic Research consortium. Nairobi, Kenya.

Quisumbing, A. and S. McNiven. 2010. "Moving Forward, Looking Back: The Impact of Migrants' Remittances on Assets, Consumption, and Credit Constraints in Sending Communities in the Rural Philippines." *Journal of Development Studies* 46 (1): 91-113.

Raihan, M., B. Khondker, G. Sugiyarto, and S. Jha. 2009. "Remittances and Household Welfare: A Case Study of Bangladesh." Asian Development Bank Economics Working Paper Series No. 189.

Ratha, D. 2007. "Leveraging Remittances for Development." MPI Policy Brief. Washington DC.

Ratha, D., P .K. De, and S. Mohapatra. 2011. "Shadow Sovereign Ratings for Unrated Developing Countries." *World Development* 39: 295–307.

Rosenbaum, P. R. and D.B Rubin. 1983. "The Central Role of the Propensity Score in Observational Studies for Causal Effect." *Biometrika* 70(1):41-45.

Salman, K.K. 2012. "Do Microenterprises Reduce Poverty in Rural Nigeria?" Asian Research Publishing Network (ARPN) *Journal of Agricultural and Biological Science* 7(6): 421-429.

Sylvie Demurger and Shi Li. 2012. "Migration, Remittances and Rural Employment Patterns: Evidence from China." Working paper GATE 2012-30.

Williams. M.F., E.O. Onyukwu, and O.N. Emmanuel. 2011. "International Remittance Inflows and Household Welfare: Empirical Evidence from Nigeria." *Research Journal of Finance and Accounting* 2(3):140-149.

World Bank. 2003. "Global Development Finance: Striving for Stability in Development Finance." Washington, DC: World Bank.

_____. 2011. *Migration and Remittances Fact Book*. World Bank Migration and Remittances Unit. Washington DC: The World Bank.

_____. 2013. "Migration and Remittance Flows: Recent Trends and Outlook, 2013-2016.: *Migration and Development Brief,* 21.

_____. 2014. "Nigeria Economic Update: World Bank Cites Positive Economic Trends and Progress in Poverty Reduction." World Bank News.

_____. 2016. "Migration and Remittances: Recent Developments and Outlook". Migration and Development Brief 26.

Appendix: Validation of the Logistic Regression model of receiving Remittance

In general, the logit model estimated was found to be a good predictor as demonstrated by the results of two alternative tests of goodness of model fit, the Hosmer and Lemeshow (H-L) static and the chi square test. The H-L goodness of fit test static was 1857.53 and it was not significant (p=0.997), indicating that the model is a good fit, as the rule of thumb for accepting a logit model is that the p-value must be greater than 0.05 and should show non-significance (Hosmer & Lemeshow, 1989). Secondly, the model has a chi-square statistic of 409.77, which is statistically significant at the 1 percent confidence level, therefore implying that all the predicators included in the model are capable of jointly predicting households receiving remittances. Coefficients of the specification of household receipt of remittances are estimated partly to test the robustness of results. Remittance receiving or not is binary, taking the value 1 if a household receives remittances and 0 otherwise. Coefficients are in log odds and the estimation is performed without the sampling weights.

Using propensity scores for receiving remittances generated by the logit regression model, treated households (those that received remittance) were matched on the basis of the proximity of their propensity scores of receiving remittance to households in the counterfactual. All other households, whose propensity scores for receiving were different from the range of scores for the treated households were dropped from the analysis. By dropping all the counterfactual households whose probability of receiving remittances was very different from the treated households, differences in welfare and self-employment outcomes were then compared between households that were more similar; as such, any differences in outcome variables between the recipients and non-recipients are attributed to the remittances alone.

Most predictors have expected signs consistent with the results of previous studies (Table A). Households with members in their productive age and also in the South-South and southwest region of Nigeria are likely to receive more remittances. This is justified in the literature. Migration and poverty is a rural phenomenon. Imperatively, rural households are more likely to have a migrant who is likely to send remittances for the improvement of household wellbeing. Remittance-receiving households have more members that are educated compared to non-recipients. Also, education's effect on propensity to receive remittances depicts an increasing effect. More male-headed households have a higher propensity to receive remittance with increasing effect compared to female-headed households.

The propensity score generated (Table B) is a probability, so the average probability in the treatment for all households are 65.5 percent; i.e. the probability that a particular household will be treated (treatment assignment) is 65.5 percent with respect to the outcome variable (being self-employed or not).

Table A: Logistic regression model

	Coefficient	Standard Error
Education	0.054**	0.314
Age of household head	-0.021	0.762
Marital status	-0.953	0.704
Household size	0.607***	0.314
Agricultural land	0.429**	0.119
Gender	0.696	0.052
Occupation	-1.749**	0.825
North Central	-2.986*	1.218
North East	-3.078***	1.125
North West	-2.670***	0.695
South East	0.330	0.251
South West	1.112***	0.129
South South	1.211***	0.118

Number of observation= 2251
Chi^2 = 4745.86
Pseudo-R^2= 0.1871
Log likelihood= -1031.3977
'*': significant at 10% level; '**':5% level; '***':1% level
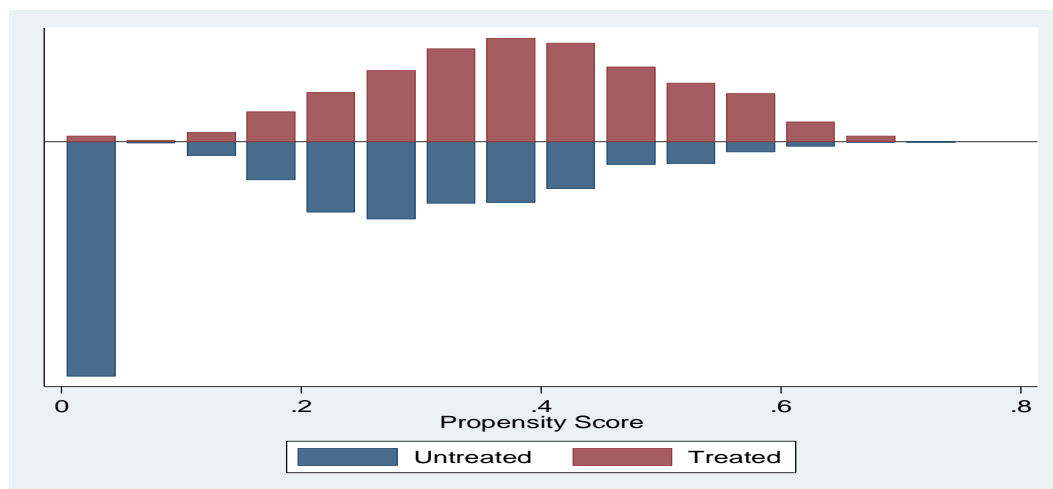Source: Author's computation from World Bank data (2009/2010)

Table B: Propensity score

Variable	Observation	Mean	Std. Dev.	Min	Max
Propensity score	2251	0.6547	0.2930	0.069	0.999

Source: Author's computation from World Bank data (2009/2010)

In order to test for balancing, i.e. quality of match, a common support graph was drawn. This test is effective because it shows a visual presentation of the overlap of propensity scores between the treatment and control cases. A larger proportion of overlap implies a good match of treatment and control cases (Dehejia and Wahba, 2002). In the graph below, there is a considerable overlap of propensity scores between the treatment and control groups; this implies that the match is good.

Figure A: Common support graph

Source: Author's computation from World Bank data (2009/2010)

AGRODEP Working Paper Series

0015. Modeling the Determinants of Poverty in Zimbabwe. Carren Pindiriri. 2015.

0016. The Potential Impact of Climate Change on Nigerian Agriculture. Joshua Ajetomobi, Olusanya Ajakaiye, and Adeniyi Gbadegesin. 2015.

0017. How Did War Dampen Trade in the MENA Region? Fida Karam and Chahir Zaki. 2015.

0018. Rising Global Food Prices and Price Variability: A Blessing or a Curse for Global Food Supply? Mekbib G. Haile. 2015.

0019. Mother's Education and Children's Nutrition Outcomes in Burkina Faso: Is there a Strong Casual Relationship? Eugenie Maiga. 2015.

0020. The Impact of Namibia's Income Tax Reform. A CGE Analysis. Blessing Chiripanhura and Ronald Chifamba. 2015.

0021. An Analysis of the Fishing Industry in Namibia: The Structure, Performance, Challenges, and Prospects for Growth and Diversification. Blessing Chiripanhura and Mogos Teweldemedhin. 2016.

0022. Artificial Insemination, Livestock Productivity and Economic Growth in Senegal. François Joseph Cabral. 2016.

0023. Impacts of Health Services on Agricultural Labor Productivity of Rural Households in Burkina Faso. Omer S. Combary. 2016.

0024. Fertilizer Subsidy and Agricultural Productivity in Senegal. Abdoulaye Seck. 2016.

0025. Decision to Export among Ghanaian Manufacturing Firms: Does Export Destination Influence the Entry Sunk Cost. Francis M. Mulangu and Luke O. Olarinde. 2016.

0026. Informal Trade and the Price of Import Bans: Evidence from Nigeria. Sami Bensassi, Joachim Jarreau, and Cristina Mitaritonna. 2016.

0027. The European Union's and United States of America's Non–Tariff Measures: Impacts on African Exports. Kareem, Olayinka Idowu. 2016.

0028. An Exploration of the Determinants of Bribery in Benin's Transborder Trade. Sami Bensassi, Joachim Jarreau, and Cristina Mitaritonna. 2016.

0029. Natural Resource Curse in Africa: Dutch Disease and Institutional Explanations. Richard Mulwa and Jane Mariara. 2016.