IMPACT OF MIGRANT REMITTANCES ON HOUSEHOLD WELFARE IN NIGERIA

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Abstract

Generally, households employ remittance as a coping strategy to adapt or improve overall wellbeing. The recent effect of remittances on household wealth has not being fully studied in Nigeria. This paper examines the impact of remittances on household's expenditure and wealth (asset accumulation) in Nigeria using the Nigeria 2015/2016 General Household survey data. Propensity score matching and endogenous switching regression models was used to evaluate welfare status of the households. Result shows that remittance has an impact on the household's expenditure with average treatment effect and average treatment effect on treated of ₦16772 and -₦2311 respectively and a significant effect on wealth of 1.12 and 0.79 respectively indicating a strong and positive relationship between remittance and wealth than on expenditures. The study suggests quality education, provision of sustainable jobs by both private and government that stimulates investment and result in better use of transfers.

Keywords: remittance; household welfare; wealth; Nigeria.

1.0 Introduction

Migrants are defined as persons who have changed their place of usual residence (UN Statistics Division, 2017) or persons who live outside the country of which they are a citizen or national (OHCHR, 2014). Migration is likely to generate greater prosperity on gross domestic product (Citi Global Perspective and solution, 2018, Nathan, 2014), human and physical capital per worker (Preston, 2014), innovation and total factor productivity (Alesina *et al.,* 2016 ; Akcigit *et al.,* 2017) and fiscal impact (Alesina *et al.,* 2018). Globally, 60 percent of all migrants are in Asia or Europe but countries like the U.S. and Canada together host the greatest number of migrants by country (UNPD, 2018). The highest growth in migration has been from developing to developed countries (International Migration report, 2017), in which women make up 48% of migrants worldwide (World Bank, 2018; UNPD, 2017). Arranged in order of importance, the pull factors that attract transit migrants to intended destinations include generally better living standard, better chances of getting a job, freedom from oppression, personal freedom, access to

better education, access to better medical care, good social welfare system, reunite with family members, better chances of finding a partner (World bank, 2018).

Remittances are tangible benefits of migration which refers to the transfer of money by foreign worker to individual in their origin country. The capacity of households to adapt sufficiently to either maintain, or improve their food security status and overall wellbeing in the face of unemployment, high cost of living, famine, climate variability will influence their decisions to choose migration as an adaptive and or mitigation strategy. Globally, remittances reached $613 billion, flows rebounded in all regions in 2017; in Europe and Central Asia by 20.9 percent, in Sub-Saharan Africa by 11.4 percent, in the Middle East and North Africa by 9.3 percent, in Latin America and the Caribbean by 8.7 percent, in East Asia and the Pacific by 5.8 percent, and in South Asia by 5.8 percent. The trend is expected to continue in 2018, with remittance flows to Low and Medium Income Countries (LMICs) growing an estimated 4.1 percent to reach $485 billion and forecasted for 2019 by 3.7 percent to reach $503 billion (World Bank, 2018, World Bank, 2017b).

Remittances can reduce the level of poverty by directly augmenting the incomes of poor households (Ewubare and Okpoi, 2018), increasing the employment and wages of the poor (Plaza, 2016). Although remittances are spent primarily for consumption, especially in the case of poorer households, remittances also provide funds for education, health, and business investments in many poor countries and for asset accumulation (Kangmennaang *et al.,* 2017). In 2016, remittance flows to developing countries reached $442 billion, more than three times the size of official development, significantly exceed foreign direct investment flows assistance except for China (World Bank, 2016b) and amount to one-third of gross national product in Tajikistan, Nepal, and Haiti. It increased in 2017 by 8.5 percent, rising to $466 billion in LMICs.

Nigeria recorded the highest inflows in remittances in Africa followed by Egypt (Ratha *et al.,* 2018) with 0.6 percent as the percentage of total population, 45.1 percent of female migrants, and 18.9 years as the median age of migrants (United Nations, 2017). Exchange rate fluctuation and existence of competitive options in the informal market make migrants to use informal channels to remit money back home. Despite Nigeria position as the top remittance recipient in Africa and fifth in the world, with yearly stated increase in GDP, the country is still making little progress in eliminating poverty and has the largest extreme poverty population (Quartz Africa, 2018).

A plethora of studies have examined the macroeconomic (RGDP, BOT, and inflation) impact of remittances on Nigeria economy (Onyeisi and Odo, 2018; Adeagbo and Ayansola, 2014), savings and investment (Fayomi *et al.,* 2015) while few studies have looked at it at the microeconomic (income, consumption) level (Ewubare and Okpoi, 2018; Salman, 2016). This study attempts to add to literature on the impact of migrants remittances on household's

expenditure in Nigeria using the new impact evaluation method (Endogenous Switching Regression).

Optimistic and pessimistic theory views migration from a positive perspective and argued that international remittance inflows enable household to relieve budget constraints, and stimulate demand of goods and services, which, in turn, stimulate production and employment (Stark, Taylor and Yitzenaki, 1988; Taylor and Wyatt, (1996) while the later argued that remittance flows may generate a level of domestic demand of goods that exceeds the domestic economy's production capacity, and thus may represent a source of higher inflation (Adams, 1991) and recipients of international remittances could afford to work less given the income effect of international remittance flows.

Structural or dependency theory assumed that dependency on global political-economic system have been dominated by the industrialized nations with brain drain is one of the negative outcome of capitalism on less developed societies (Todaro, 1997 and Chami *et al.,* 2003). Neo-classical economic growth theory analyzed by Roel (2006) opined that capital and low skilled labour flows from high-wage earning countries to low-wage earning ones and from high-wage earning countries to low-wage earning ones respectively.

2. Literature Review
Different literatures suggest that migrant remittances improve the welfare of individuals in their home countries. Salman (2016) 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 and employed PSM and ESR models. The results showed that recipient households had 92.3 percent higher per capita expenditures than non-recipients and recommended a public enlightenment campaign on the need to invest remittances, trainings to build households' entrepreneurial skills, and supportive government business promotion policies.

A household survey was conducted by Awan *et al.,* (2015) assessed the transaction costs associated with the transfer of remittances and the sources used to finance overseas migration. Analysis from PSM reveals that overseas migration has substantial benefits as measured by migrants' consumption levels, their expenditures on health, education, and vehicles, and the level of household savings. It has also been suggested that setting up institutions to provide loans for potential migrants, building awareness of the Pakistan Remittance Initiative, reducing money transfer costs through formal channels will facilitate migration and the transfer of remittances.

Waldier *et al.,* (2017) used data from a household survey conducted in Moldova in 2011 to assess the impact of remittances and social assistance transfers on household's expenditure patterns. Using Instrumental Variable (IV) the study revealed that social assistance and

remittances have different impacts on expenditure patterns and the source of income determines how it is spent. The average amount received is almost ten times higher for remittance-receiving households, compared to households that receive social assistance. The PCE per adult equivalent is, on average, for households receiving remittances is 1092 Lei and spends 48% of it on food while PCE for households receiving only social assistance is 973 Lie and spends 54% on food implying that both are complement rather than substitute.

Data from 2010 Bangladesh Household Income and Expenditure Survey and 2012 Vietnam Living Standards Survey was used to examine the wellbeing outcomes of remittance. The results showed that the temporal extent of internal and international migration is positively associated with remittances in both delta region with significant positive effect on household well-being in the source rural areas, including overall income, investments in health, food security and access to sanitation. The study concludes that landscapes of urban and rural deltas are increasingly economically integrated which suggests greater resilience even for environmentally-at-risk tropical delta (Szabo *et al.,* 2018).

Kuschminder *et al.,* (2018) used a world-in-motion project data examine the relationship between migration and multi-dimensional well-being in Ethiopia and revealed the differences in well-being between migrant, non-migrant and return migrant households. Their study found that migrant and return migrant households are better off in terms of well-being than non-migrant households in terms of education, housing and asset owing. Also, households with a migrant in the North are significantly more likely to report higher well-being outcomes than non-migrant households, but not true for households with migrants in other destination regions.

Amega (2018) investigates the effects of remittances on education and health outcomes using a 5-year interval data on 46 Sub-Saharan African (SSA) countries from 1975 to 2014. Employing Generalized Method of Moment's system, remittances were found to significantly improve education and health in SSA. It was also established that improving education impacts positively on health.

Kangmennaang *et al.,* (2017) examines the effect of migration and remittances on the food security and asset wealth in rural northern and central Malawi using structured questionnaire from 1000 sampled rural households. Results indicate that households with migrant members were ($\beta = -0.157$, $p = 0.01$) less likely to be food insecure and has an average treatment effect of ($\beta = 0.151$, $p = 0.01$) on household asset levels, indicating a positive effect on household asset accumulation. However, the effects of migration and remittance receipt on food security were greater than their effects on wealth. The study recommended that policies and programs should be directed at aiding remittance flows through financial intermediation, and reducing the cost of receiving remittance in order to maximize the positive effects of remittance flows.

Investigating the linkage between international migration, remittances and household welfare in Nigeria using 2009 world bank migration survey revealed variables such as age of household head, household size, region of residence, education and rural/urban place of residence analyzed with asset index technique, ordinary least square and probit regression (Ajaero *et al.,* 2017).

3.0   Data and Methodology

3.1   Data
The 2015 General household survey data conducted by the World Bank for Nigeria was used for this study. The study used information on a variety of demographic, social, and economic characteristics, such as age, household size, education, marital status, house rent, agricultural land and geopolitical zone. Per capita household expenditure (PCHE) and household assets (wealth) was used as a proxy for measuring welfare. The data has a national representation with a sample size of 2706 respondents.

Household wealth which is a composite index of a household's ownership of a number of consumer items and assets was constructed using the MIS wealth creation guidelines (MIS, Malaria Indicator Survey, 2015). Principal component analysis, a procedure for extracting from a set of variables, orthogonal linear combinations of the focal variables that capture the common information most successfully, was used to construct an overall index of household wealth (Zeller *et al.,* 2006). Each asset was normalized by its mean and standard deviation and combined to create wealth level of the households.

3.1.1   Some Socio-Economic Characteristics among Recipient and Non-Recipient Households.
The socio-economic characteristics of recipient and non-recipient households are presented in table 1 and 2. The average age of the household head (64.65 years), years of education of household head (6.68 years) and total expenditure of household (₦278148.8) of the recipient household were higher than non-recipient household. This could suggest that recipient household might have a better welfare status than the non-recipients.

Table 1: Socio-Economic Characteristics of Recipient Households.

Variables	Observation	Mean	Std. Dev.	Min	Max
Age	62	64.64516	13.65752	39	100
Age squared	62	4362.516	1793.055	1521	10000
Household size	62	6.064516	3.463491	1	19
Years of education	62	6.677419	6.105021	0	18

Health Expenditure (₦)	62	9656.935	18320.07	0	134900
House Rent (₦)	62	104.8387	466.7387	0	30000
Total Expenditure (₦)	62	278148.8	330999.1	1420	1673920
Per capita Expenditure (₦)	62	58262.33	71161.25	311.4286	324670

Source: Author's computation from General household survey data (2015)

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

Variables	Observation	Mean	Std. Dev.	Min	Max
Age	2644	53.72012	13.96673	20	103
Age squared	2644	3080.847	1580.321	400	10609
Household size	2644	7.594554	3.636499	1	34
Years of education	2644	5.077534	5.060478	0	18
Health Expenditure (₦)	3926	4137.187	14153.37	0	220000
House Rent (₦)	2644	73.61952	937.8961	0	27000
Total Expenditure (₦)	2644	173189.6	285129.4	50	3308780
Per capita Expenditure (₦)	2644	30838.15	67554.1	5.55	1126560

Source: Author's computation from General household survey data (2015)

3.2   Analytical Tools

The analytical tools used for this study are the Propensity Score Matching (PSM) and Endogenous Switching Regression (ESR). The PSM, a non -parametric technique controls for heterogeneity effect due to observable characteristics but will yield unreliable estimate in comparing outcomes of change between the treatment and control household when cross sectional data is used. The ESR is therefore considered to account for endogeneity bias and the effect of unobservable covariates.

3.2.1   PSM

As proposed by (Rosebaum and Rubin 1983: Heckman *et al*., 1998; Smith and Todd, 2005; Wooldridge, 2005) the basic idea of the PSM method is to match observations of recipient household and non-recipient household according to the predicted propensity of receiving remittance. It also helps to evaluate programs that require longitudinal datasets using single cross-sectional dataset and compare the observed outcomes of recipient household with the

outcomes of counterfactual non-recipient (Heckman *et al.*, 1998). The main feature of the matching procedure is the creation of the conditions of randomized experiment in order to evaluate a causal effect as in a controlled experiment. The propensity scores were computed using binary logit regression models, given as:

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

Where, D= {0,1} is the indicator of exposure to treatment characteristics (dependent variable), i.e. D=1, if exposed to treatment and D=0, if not exposed. X is a multidimensional vector of observed characteristics (explanatory variables). These variables are those expected to jointly determine the probability to involve in the treatment and 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). 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 Rosenbaum and Rubin (1983) as follows:

$$ATT = E(Y^1 - Y^0/D = 1) = E(Y^1/D = 1) - E(Y^0/D = 1) \tag{2}$$

Where $E(Y^1/D = 1)$ is the observed outcome of the treatment, i.e. welfare status by household that received remittances and $E(Y^0/D = 1)$ is the counterfactual outcome, or extent of welfare households would have attained had they not received remittances.

3.2.2   Endogenous Switching Model

The endogenous switching probit model, recently developed by Lokshin and Sajaia (2011), was used to measure the impact of remittances on welfare status (PCHE) 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 regressor. The model was therefore utilized to estimate the effect of remittances (binary endogenous regressor) on the PCHE and Asset index (continuous variable) among households. The endogenous switching regression model, on the other hand, implements the full information Maximum Likelihood (ML) method to simultaneously estimate the binary selection and the outcome parts of the model to yield consistent standard errors of the estimates. Following Asfaw, (2010), Akpalu and Normanyo (2014) and, the assumption is that remittance

recipient households would have an additional source of income which will translate into an increase in per capita expenditure and asset accumulation (welfare) when compared to non-recipient households with the same observed socio-economic characteristics. Let w_0 be the welfare of non-jatropha recipient households, and let w_1 be the corresponding welfare of recipient households. Household will choose to be in the treatment if the welfare defined as $Y_i^* = w_1 - w_0$ increases.

However, the increase in welfare status that the household derives from treatment (Y_i^*) is a latent variable determined by observed characteristics (Z_i). This model is comprised of the selection equation or the criterion function and two continuous regressions that describes the behaviour of the household as they face the two regimes of receiving remittance or not. The selection equation is defined as;

$$T_i^* = \beta_0 + \gamma Z_i + \mu_i \ \ with \ \ T_i = \begin{cases} 1 \ if \ Y_i^* > 0 \\ 0 \ if \ Y_i^* \leq 0 \end{cases} \ \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3)$$

where T_i^* is the unobservable variable for receiving remittance and T_i is its observable counterpart which is the dependent variable (PCE and Asset index) and equals one, if household receive remittance and zero otherwise. γ is a vector of parameters while Z_i are non-stochastic vectors of observed household characteristics determining recipient of remittance and μ_i is random disturbances associated with remittance recipient. The two welfare outcome equations are defined as follows:

Regime1: $Y_{1i} = \gamma_1 x_{1i} + \varepsilon_{1i} \ \ if \ \ T_i = 1 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots. (4)$

Regime2: $Y_{2i} = \gamma_2 x_{2i} + \varepsilon_{2i} \ \ if \ \ T_i = 0 \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$

where Y_{ji} are the dependent variables or outcome variables (per capita expenditure/asset index) in the continuous equations; x_{1i} and x_{2i} are vectors of exogenous variables; γ_1 and γ_2 are vectors of parameters; ε_{1i} and ε_{2i} are random disturbance terms.

The endogenous switching regression model estimates a simultaneous equation with endogenous switching by the full information Maximum Likelihood (FIML) with the various covariates /variables that influences recipient and non-recipient. The method simultaneously estimates the

binary selection (determinants) and the binary outcome (impact) parts of the model to yield consistent standard errors:

$$\Omega = \begin{bmatrix} \sigma_\mu^2 & \sigma_{1\mu} & \sigma_{2\mu} \\ \sigma_{1\mu} & \sigma_1^2 & . \\ \sigma_{2\mu} & . & \sigma_2^2 \end{bmatrix}$$

where $\sigma_\mu^2 = var(\mu_i)$, $\sigma_1^2 = var(\varepsilon_1)$, $\sigma_2^2 = var(\varepsilon_1)$, $\sigma_{1\mu} = cov(\mu_i, \ \varepsilon_1)$, $\sigma_{2\mu} = cov(\mu_i, \ \varepsilon_2)$. Furthermore, σ_μ^2 is estimated up to a scalar factor and can be estimated to be equal to 1 (Maddala, 1983) and $cov(\varepsilon_i, \ \varepsilon_2)$ is not defined as Y_1 and Y_2 cannot be observed simultaneously, hence the dots in the covariance matrix. Moreover, the correlation between the error term of the selection equation and the outcome equation is not zero $i.e., (corr(\mu_i, \ \varepsilon_1) \neq 0)$ & $corr(\mu_i, \ \varepsilon_2) \neq 0$ which creates selection bias. ESR addresses this selection bias by estimating the inverse mills ratios $(\lambda_{1i} \ and \ \lambda_{2i})$ and the covariance terms $(\sigma_{1\mu} \ and \ \sigma_{2\mu})$ and including them as auxiliary regressors in equations (4) and (5). If $\sigma_{1\mu}$ and $\sigma_{2\mu}$ are significant, the absence of selection bias will be rejected. In addition, $\sigma_{1\mu} < 0$ represents positive selection bias (i.e., households with above-average welfare are more likely to choose to be in the treatment).

The logarithmic likelihood function given the previous assumptions regarding the distribution of the error terms is

$$\ln L_i = \sum_{i=1}^{N} \left\{ T_i \left[\ln \phi \left(\frac{\varepsilon_{1i}}{\sigma_1} \right) \ln \sigma_1 + \ln \Phi(\theta_{1i}) \right] + (1 - T_i) \left[\ln \phi \left(\frac{\varepsilon_{2i}}{\sigma_2} \right) - \ln \sigma_2 + \ln \left(1 - \Phi(\theta_{2i}) \right) \right] \right\}$$

Where ϕ and Φ are the standard normal probability density function and normal cumulative density function respectively and

$$\theta_{ji} = \frac{\gamma Z_i + \rho_j \varepsilon_{ji} / \sigma_j}{\sqrt{1 - \rho_j^2}}$$

With $j = 1,2$ and ρ_j denoting the correlation coefficient between the error term μ_i in the selection equation (3) and the error term ε_{ji} of the outcome equations (4) and (5).

$$\rho_1 = \frac{\sigma_{21}^2}{\sigma_u \sigma_1}$$

$$\rho_2 = \frac{\sigma_{21}^2}{\sigma_u \sigma_2}$$

To make sure that ρ_1 and ρ_2 are bounded between -1 and 1, and estimated σ_1 and σ_2 are always positive, the maximum likelihood directly estimates $\ln \sigma_1$, $\ln \sigma_2$, atanh ρ:

$$\text{atanh} \, \rho_j = \frac{1}{2} \ln \left(\frac{1 + \rho_j}{1 - \rho_j} \right)$$

A negative and significant rho(ρ) i.e. correlation coefficient indicates that adoption has an impact on treated group than any random sampled individual would have from the sample (Lokshin and Sajaia, 2004).

4.   Results and Discussion

4.1   Household Expenditure Pattern

The average budget of recipient and non-recipient households shows great marginal differences shown in table 3. For instance, recipient households tend to spend more on consumption of food, non-food and health care. However, there is no significant difference in the proportion of expenditure on house rent. These results suggest that remittance recipient seems to be spent more on essential household needs to ensure that they are food secured or reduce fear of starvation. This explains the important role remittance play on food security and development in developing countries (Crush and Caesar, 2017; Thapa and Acharya, 2017).

4.2   Wealth status of recipient and non-recipient households

Table 4 shows the wealth status of recipient and non-recipient households. The mean asset index for all households is -0.3361. Out of 2706 households, 1759 i.e. 65.48% are below the mean and 932 households i.e. 43.44% are above the mean (non-poor). Non-recipient household have the mean asset index of -0.3715 with 65.43% and 34.53% living below and above the mean asset index respectively. The mean asset index for recipient household is 1.1746 with 53.23% and 45.16% living below and above the mean respectively. There is a significant difference in the mean of asset index between the recipient and non-recipient households and great difference in the number of poor and non-poor in recipient and non-recipient households.

4.3   Factor that influences household's remittance

The probability of receiving remittances is shown in table6. The sex of household head was found to have a positive and significant influence on remittance. This could be associated with the importance of remittance in reducing inequality, strengthening their insurance effects and mitigating some of the negative impact of shocks on the poorest (Koczam and Loyola, 2018). The number of years of education, having a civil job, agricultural land holding was found to influence remittance flow. This could imply that households that receive remittance were more educated, has civil jobs which could meet their domestic need, therefore spend more in acquisition of land (Crush and Caesar, 2017).

4.4   Impact of remittance on household per capita expenditure (PCE) and asset level from propensity score.

The impact of remittance of remittance on household per capita expenditure is shown in table 5. Remittance has a positive effect on the whole population though not significant, but has a negative impact on the treated group. This suggests that remittance recipients spend more on other expenditure such as land holdings and health services rather than on food and non-food items. It was also found to have a positive impact on the whole population and treated group based on asset accumulation or durable goods (Randazzo and Piracha, 2014).

4.5   Effect of remittance on PCE and Asset accumulation using Endogenous Switching Regression

The effect of remittance on welfare using endogenous switching regression is shown on table 6. The result shows that sex, household size, years of education, having civil jobs and sector (being in rural or urban) influences or motivates remittance. Remittance showed a positive and effect on per capita expenditure of ₦116063.7. A negative and significant rho coefficient (-0.81265) suggests that self-selection occurred and remittance have an impact on recipient household per capita expenditure than a random household would have from the sample. Its effect on wealth was found to be positive and significantly different from zero. A significant and negative rho coefficient (-0.12192) suggests that self-selection occurred and remittance have an impact on recipient households asset accumulation than a random household would have from the sample. This is in line with the findings of Kangmennaang *et al.,* (2017) in the important role that remittances play on wealth accumulation.

Conclusion

Remittances play an important role in developing countries and household welfare. The way remittances are spent on consumption and investment goods is strictly determined by the context of the analysis with some countries making productive use of remittances better than others (Randazzo and Piracha, 2014). This paper investigates the impact of remittances on household per capita expenditure, and wealth using asset accumulation as proxy. Nigeria general household survey (GHS) data was used. The analysis was conducted using two way test of significance (t test statistics), kernel based propensity score matching and endogenous switching regression.

Result from ttest shows that recipient households make productive use of remittance in provision of consumable goods, durable goods and acquiring health services. The logit regression shows that sex, number of years of education, having civil jobs and agricultural land influences remittances. Kernel based propensity score shows that remittances has a negative impact on recipient households but has a positive impact on wealth. This could be due to the fact that recipient household are civil job holders and spends their income in meeting the food requirement of the household and uses the remittances in acquiring durable assets in their homes. The importance of overcoming self-selection and endogeneity problems is shown from the endogenous switching regression. The significance of the rho coefficients shows that remittance has an impact on the recipient household.

Poverty and disparities in income per capita among developing countries helps explain why household use remittance for different purpose. This suggests that remittance can play an important role in the development process if there is a common effort to ensure some minimum standard of living among the whole population. Better quality of information and education, provision of sustainable jobs by the government which stimulates investment can result in better use of transfers.

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Table3. T-test of difference in mean of recipient and non-recipient households

	Household with remittance	Household without remittance	Difference	Two way t-test (t-statistics)
PCE	58262.33	30838.15	-27424.17***	-3.16
Food	272129.80	170772	-101375.80***	-2.77
Non food	6019.03	2417.52	-3601.52***	-4.85
Health	9656.94	4137.19	-5519.78***	-3.01
House rent	101.84	73.62	-31.22	-0.26

Significant at '***'1% level

Table4. Wealth status of recipient and non-recipient households

Asset index	Recipients	Non-recipients	All	Difference	t-test
Mean asset index	1.1746	-0.3715	-0.3361	-1.546***	-8.373
Poor	33(53.23%)	1730(65.43%)	1759(65.48%)		
Non-poor	28(45.16%)	913(34.53%)	932(34.44%)		

Table5 Average effects of remittances on per capita expenditure and asset levels using kernel based propensity score matching.

Per capita expenditure	Coefficients	Standard error	Confidence interval	
ATE	16772.76	11181.57	-5142.718	38688.24
ATT	-2311.522	14935.91	-31585.36	26962.32
Asset levels				
ATE	1.12***	0.23	0.66	1.57
ATT	0.79**	0.38	0.04	1.53

Significant at '**'5% level; '***'1% level

Table6. Average effect of remittance on Per capita expenditure and Asset accumulation using Endogenous Switching Regression

Personal characteristics	Per capita Expenditure		Remittance		Asset Accumulation		Remittance	
	coefficients	Std Errors	Coefficients	Std Errors	coefficients	Std Errors	coefficients	Std Errors
Sex	2743.58	6529.75	0.41*	0.25	-0.40***	0.12	0.79***	0.299
Age	414.08	598.41	0.05	0.03	0.02*	0.01	0.02	0.036
Age squared	-4.24	5.27	-.00029	0.003	-.000091	0.001	-0.00002	0.003
Household size	-4380.55***	371.23	.0049	0.012	0.04***	0.007	0.0026	0.021
Marital status	7770.97	5668.27	0.10	0.24	-0.04	0.11	0.28	0.288
Years of education	1393.48***	289.53	0.04***	0.01	0.08***	0.006	0.08***	0.015
North central	7184.74	5570.98	-0.08	0.23	-0.07	0.106	-0.03	0.284
North east	-2175.46	5799.23	-0.37	0.38	-0.33***	0.110	-0.49	0.427
North west	-7889.73	5477.89	-0.06	0.25	-0.30***	0.103	-0.16	0.308
South east	-4408.17	5514.19	0.38**	0.18	0.37***	0.105	0.56**	0.219
South south	25926.8***	5821.90	-0.15	0.20	0.43***	0.110	-0.13	0.268
House rent	-1.69	1.36	-0.000036	0.009	0.00008***	0.0002	0.000011	0.0005
Civil job	-12908.0***	4272.74	0.68***	0.25	-0.51***	0.081	0.72**	0.292
Agric land	-3968.15	2963.79	-0.15	0.11	-0.19***	0.056	-0.28**	0.137
Sector	-8699.67**	3841.56	-0.19	0.12	-0.75***	0.073	-0.41***	0.146
Banks in state			0.00031	0.003			0.001***	0.0003
Remittance	116063.7***	7245.96			1.32***	0.280		
Constant	82244.79***	23382.91	-4.86***	1.23	1.26***	0.444	-5.48***	1.472

Observation	2706				2706			
Loglikelihood	-33956				-4626.083			
Waldchi2(16)	626.28				1050.03			
Prob > chi2	0.0000				0.0000			
Rho	-0.81265***				-0.12192			
Sigma	64997.6***				1.2330***			
Lambda	-52819.93				-0.1503412			
LR test of indep. eqns. (rho=0): chi2(1) = 45.06 prob > chi2 = 0.0000					LR test of indep. eqns. (rho=0): chi2(1) = 1.90 prob > chi2 = 0.1678			

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

Source: Author's computation from World Bank data (2015/2016)