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# The development outcomes of remittance inflows to Nigeria: the case of the Southeastern Geo-political zone

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## ABSTRACT

Remittances to Sub-Saharan Africa (SSA) constitute a critical lifeline for millions of individual households. It is on record that these large transfers enable recipient households to raise their living standards beyond vulnerability and subsistence levels. Unfortunately, the development potentials of remittance income are seldom factored into most pro-poor targeting programmes in many SSA countries like Nigeria. This is largely due to the problems of data inconsistency as well as those related to lack of precise information on how remittances are received and spent. Using novel survey dataset involving 450 remittance recipient and non-recipient households collected in the Southeast Geopolitical Zone of Nigeria, the study uncovers significant evidence of the impact of remittances on household expenditure and poverty using propensity score matching (PSM). Specifically, households that receive remittances invest between NGN186,000 (US\$1,240) and NGN205,000 (US\$1,366.7) more in building constructions, land acquisitions and also invest over NGN60,000 (US\$400) more in household business enterprise compared to non-recipient households. Similarly, the estimated impact of remittances on poverty shows that household poverty is lower by between 30.3% and 33.6% considering the results from all the three PSM matching estimators. The differences between the recipients and non-recipients are statistically significant. The implications of the findings are discussed in terms of pro-poor targeting programmes in Nigeria.

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## Introduction

Over the last few decades, the development potentials of remittance, especially within the context of developing countries, have attracted significant policy attention. First, it has been observed that between 1990 and 2010, remittance flows to low-middle-income countries (LMICs) amounted to less than US\$334 billion. However, just 10 years later, remittance income to these countries is estimated to have reached almost US\$574 billion: implying annual growth rates that are well above 40%, and equivalent to about 4.7% of the gross national income of the LMICs (World Bank, 2019). Second, remittance is gradually gaining

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grounds as an important fund-raising strategy in many LMICs through ‘Diaspora Bonds’ issuance (Ketkar & Ratha, 2007; UNECA, 2014). For instance, India launched her second and third diaspora bonds worth \$4.2 billion and \$5.5 billion, respectively. Other case studies are Sri Lanka and Ghana, which have successfully issued bonds worth \$500 million and \$550 million, respectively, to their diaspora populations (Fonta et al., 2015; Udah, 2014).

While the potential for many developing countries to benefit from remittance inflows clearly exists, there is a dearth of micro-level evidence, especially in sub-Saharan Africa (SSA) concerning how these large inflows are typically utilized by many recipient households. That is, in terms of consumption expenditures, investment decisions, health-seeking behaviour and outcomes, educational enrolment and outcomes, migration network as well as entrepreneurship levels and outcome. Most of the academic discussions in SSA have focused mainly on understanding the macroeconomic impacts and determinants of remittance inflows (Adenutsi, 2014; Amega, 2018; Baldé, 2009; Ncube & Brixiova, 2013; Singh et al., 2011; Urama et al., 2016), as well as how these inflows affect household poverty and income inequality at the margin (Adams et al., 2008; Adenutsi, 2011; Anyanwu, 2011; Chukwuone et al., 2012; Ellyne & Mahlalela, 2017; Fonta & Agu, 2013; Makram & Montassar, 2014; Nwosu et al., 2012). This is not surprising since promoting growth and reducing poverty and income disparity are among the most pressing challenges currently facing this region. In fact, results from many of these studies such as those of Lucas and Stark (1985), Stark (1991), and Poirine (1997), Adams (Adams, 1989a, 1989b; Adams & Page, 2005), Adams and Page (2003, 2004), Taylor et al. (2005), Yang and Martinez (2005), Yang, (2004, 2011), Acosta et al. (2007a), (2007b), Adams et al. (2008), and R. Singh et al. (2009), just to mention a selected few of the studies, were very instrumental in shaping development thinking concerning the flow of remittances to the developing countries in general and SSA in particular. For SSA, key lessons learnt from these studies include the need for more reliable remittance statistics, enabling better remittance flow channels, and the need for improved remittance regulatory regimes and their associated environment.

The purpose of this paper is to close this gap in research and investigate the extent to which remittances affect household consumption patterns in SSA. We make use of novel data collected in Nigeria, the largest recipient country in SSA, with estimated official inflows of about USD25.4 billion, and the world’s top 6 destination (World Bank, 2019). The main hypothesis tested in the study is that remittances have no significant impact on the expenditure components of receiving households, controlling for non-recipient households. To test this hypothesis, we employ the propensity score matching (PSM) method. We are not aware of any study in Nigeria that has followed this route, particularly in the Eastern region of the country, which supposedly has the largest number of emigrants in the country.

The rest of the paper is structured as follows. Section two discusses the study area and data, whereas section three presents the analytical framework used. In section four, the empirical results are presented followed by section five, which concludes the paper with potential policy implications of the findings.

## Study area and data

The data used for the analysis was generated from a household survey that was carried out in the Enugu and Anambra states of Nigeria, as part of an IDRC three countries-funded

study, on how remittances are typically utilized by West African households. As part of the research plan, it was agreed that two states (or regions) in each country be selected for the study. The selection was predicated on the volume of remittances as gleaned from migration statistics reported in the most recent National Living Standard Surveys of the involved countries, and other statistical databases. In Nigeria, the two states selected were Enugu and Anambra states. These two states are among the five states that make up the Southeast Geo-political zone of Nigeria. Over 50% of The Enugu state's population reside in rural areas, while in Anambra state an estimated 62% of the population lives in urban and semi-urban areas. The Southeast region in general, has a very highly mobile population owing to land scarcity and high population density. As reported by Bah et al. (2003), between 50 and 80% of households in the region have at least one migrant member. Migration in this region is considered essential to achieving success. Young men who do not migrate or commute to town or abroad are often labelled as idle and lazy hence objects of ridicule.

The questionnaire contained five general sections that gathered information on household socioeconomic and demographic characteristics, including wages and asset ownership, absent migrant household,<sup>1</sup> remittance expenditure and non-migrant households.<sup>2</sup> Specifically, in section four, responses from more in-depth questions concerning remittances and remittance expenditure were collected from recipient households, such as household consumption expenditure<sup>3</sup> on basic food items, education (school supplies/tuition and others), healthcare (medications and hospital bills), investment in assets acquisition (building constructions, land acquisition and cattle ownership etc.), housing (rents) or building repairs, start-up of small businesses, travel, marriage/funerals/donations or for the upkeep of other family relatives and savings.

The data were collected using two complementary approaches: focus group discussions (FGDs) and quantitative surveys with household-level questionnaires. The FGDs were mainly used to further fine-tune the survey instrument, identify and draw up a household list of non-migrant households and lastly collect other important information on remittances and migration that are located more at the community level. In all, two FGDs were held in Enugu and Anambra states. In Enugu, the FGD comprised 17 members drawn from all the 17 Local Government Areas (LGAs) that make-up Enugu state, while that of Anambra state comprised 21 members corresponding to the 21 LGAs in the state. Given that the target of the study was to identify at least 225 non-recipient households<sup>4</sup> during the FGDs, it was agreed that for each of the 38 LGAs, not more than six non-migrant households should be listed for more in-depth household interviews. For the recipient households, banks that operate with the Western Union or Money Gram transfer services were first identified. Since it was difficult to establish a sampling frame of respondents for this purpose, the interviewers selected the respondents randomly from among those that came to the banks to receive their remittances. Overall, a total of 697 remittance recipients that were randomly sampled from 24 banks, which operate money transfers through Money Gram and Western Union from the two states. Out of the 697 remittance recipients identified, about 230 recipients (125 in Anambra and 105 in Enugu) agreed to further participate in more in-depth household interviews. This amounted to 230 recipient households and 225 non-recipient households or about 455 migrants and non-migrant households.



## Analytical framework

In order to test our hypothesis, the propensity score matching (PSM) method was employed. PSM estimates the probability of treatment assignment conditional on observed baseline characteristics. This requires the assignment of the observations into two groups: the treated group that received the treatment (in this case, recipients of remittances) and the control group that did not (non-recipients of remittances). Treatment  $D$  is a binary variable that determines if the observation has the treatment or not, so that  $D=1$  for treated observations and  $D=0$  for control observations. A probit/logit model was used to estimate the PSM model with  $D$  as dependent variable as shown in the following equation:

$$p(x) = \text{prob}(D = 1/x) = E(D/x) \quad (1)$$

Where  $x$  is the vector of variables or household characteristics that determine the probability of remittance receipts. More especially, to ensure a balancing score one can transform Equation (1) and represent the treatment  $D$  as a function of a set of explanatory variables. This leads to

$$\text{Remittance} = \beta_0 + \beta_1 \text{age} + \beta_2 \text{hhsiz} + \beta_3 \text{sex} + \beta_4 \text{wksit} + \beta_5 \text{edatt} + \beta_6 \text{marstat} + \mu \quad (2)$$

where remittance is a dummy variable that takes the value 1 if the household receives remittance and 0 otherwise.

Age = Age category of a respondent

Hhsiz = household size,

Sex is gender of the household head which takes the value 1 if male and 0 otherwise,

Wksit = the work situation of the household head,

Edatt = educational attendance of the household head,

Marstat = the marital status of the household head

The propensity score is the conditional (predicted) probability of receiving a treatment given pre-treatment characteristics  $x$ . In matching observations from treated and control groups based on their propensity scores, we employed kernel, nearest neighbour, and stratification matching methods. Additionally, the outcomes  $y$  between the treated and control observations are compared in order to calculate the treatment effects. This leads to:

$$y = \begin{cases} y_1 & \text{if } D=1 \\ y_0 & \text{if } D=0 \end{cases} \quad (3)$$

In order to estimate the PSM, one needs to construct a counterfactual. This allows us to compare the outcome of the treated observations with the outcome of the same observations if they were not treated. Once we determine the counterfactual, we then estimate the average treatment effect on the treated (ATET). This is given by :

$$ATET = E(\Delta|D = 1) = E(y_1|x, D = 1) - E(y_0|x, D = 1) \quad (4)$$

The second term is a counterfactual: it is not observable and it needs to be estimated. The ATET is the average effect of treatment on those subjects who ultimately received the treatment; in this case remittance-receiving households. After matching the propensity scores, we can compare the outcomes of treated and control observations using equation :

$$ATET = E(\Delta|p(x), D = 1) = E(y_1|p(x), D = 1) - E(y_0|p(x), D = 1) \quad (5)$$

The identifying assumptions are unconfoundedness which means conditional independence of the control group outcome and treatment, and the overlapping assumption which implies that for each treated observation, there is a matched control observation with similar  $x$ . The propensity score is also a balancing score. This means that conditional on the propensity score, the distribution of observed baseline covariates will be similar between treated and untreated subjects. These are issues with propensity score we tried to ensure that the estimated ATT did not violate as it were. Since the unconfoundedness assumption is not tested directly, we computed the Rosenbaum sensitivity analysis in order to ascertain if there was any evidence of hidden bias

## Empirical results

### *Sample statistics*

Out of the total of 450 households identified, 441 were actually interviewed, either during the first visit or during the recall visits, for a total of 1,965 individuals. The mean age of the interviewees was 29 years, and average household size was 5 members. The mean monthly income of the household was estimated to be about NGN31,342 or US\$212 while, the average monthly salary for wage earners was reported as NGN28,765 or US\$192. Males constituted about 48% of the sample. Anambra state represented about 53.7% of the sample while, Enugu state was about 46.2%. Furthermore, of the 441 respondents that were actually interviewed about 48.8% of the households had migrant members while, about 51.8% reported absent migrant households. Full-time students constituted the bulk of household members (47.8%) followed by the self-employed that made up to 28% of the sample. In terms of educational attainment of the household members, those with primary education dominated (32.3%) followed closely by those with senior secondary education (29.2%). Those with tertiary education were less than 11%.

Several other facts about the sample are worth reporting. For example, the percentage of those who did not receive remittance is higher for heads of household in the age groups 21–30 (about 81.8%) and 31–40 (about 91.1%) than any other age group. This is expected because these groups fall within the active labour force and are less likely to depend on transfers for survival. Moreover, up to 52.2% of those aged above 71 years received remittances. These household heads are highly dependent and rely on remittances and other forms of assistance from their children and others for survival.

### *Household spending patterns with and without remittances*

In (Table 1), the differences in household expenditure composition between remittance recipients and non-recipients are presented. The raw statistics basically reveal the pattern of household spending with and without remittances for the two groups of respondents, not controlling for possible selection bias.<sup>5</sup> As expected, households that received remittances, on average, spend more in all expenditure categories compared to those that did not receive. For example, remittance recipients spent about 52.4% more on healthcare than non-recipient households. They equally spent about 86.9% more on the acquisition of assets (building constructions and land acquisition), than their non-recipient counterparts. The same could be said for expenditure on housing and building repairs. On

**Table 1.** Household spending patterns with and without remittances.

Expenditure Category	Received	Not Received	Total
Expenditure_Shares	456,364 (−846,703)	60,000 (−70,711)	396,364 (−787,397)
Expenditure_Building	404,352 (−514,599)	186,787 (−208,736)	280,406 (−386,538)
Expenditure_Donations	172,518 (−517,764)	39,341 (−6,759)	55,806 (−295,939)
Expenditure_Consumption	137,313 (−97,448)	104,184 (−71,241)	114,770 (−81,905)
Expenditure_Wedding	133,235 (−133,099)	63,694 (−259,724)	87,338 (−225,710)
Expenditure_Business	124,786 (−134,682)	57,139 (−62,304)	81,319 (−99,889)
Expenditure_Funerals	116,560 (−157,679)	50,425 (−171,937)	70,837 (−169,493)
Expenditure_Education	83,926 (−80,036)	50,234 (−72,715)	61,465 (−76,790)
Expenditure_Maintenance	61,197 (−127,746)	32,851 (−47,338)	42,904 (−85,746)
Expenditure_Hirepurchase	50,000 (−28,284)	39,406 (−52,967)	40,583 (−50,341)
Expenditure_Savings	48,022 (−57,539)	24,128 (−31,116)	33,169 (−44,509)
Expenditure_Health	37,612 (−43,412)	17,892 (−27,984)	24,251 (−34,926)

Source: The authors.

Note that the figures in parentheses are the standard deviations

average, households that received remittances spent at least 53.8% more on housing and building repairs than the non-recipient households. To verify whether the comparative analyses were statistically plausible, a significance test of expenditure differential between recipients and non-recipient households was carried out (Table 2). The results suggest that except for expenditures on weddings, share purchases, hire purchases and funerals, the non-recipients have lower expenditure levels than recipients.

However, it could be the case that those who receive remittances always have higher expenditure even without treatment. In this case, test of mean difference alone (Table 2) is not sufficient to attribute higher expenditures to remittances. To overcome this selection bias problem, the PSM technique was employed. (Tables A1 and A2) in the Appendix show the descriptive statistics of the covariates used in the estimation of the propensity score. We reported the pre-treatment summary statistics and this test of mean difference shows no statistical significance between remittance recipients (treated) and non-recipients (control) except the age category variable that is significantly higher for recipients. But the summary statistics of the covariates after matching reported in (Table A2) show that the percentage of biases in the covariates between treatment and the control group are not extremely high. This ranges between 6.7% and 16.6%. The t-statistics (or the p-values) show no statistical significance. This suggests that these covariates were helpful in building a good control group for the estimation of impact of remittances on welfare or development outcomes. With these covariates, the balancing property was achieved as shown in the pscore graphs and the area of common support as reported in (Figures A1 and A2) of the Appendix. It was possible in this study to find sufficient overlap (good number of observations) to estimate the propensity score as recommended by Rosenbaum and Rubin (1983)

**Table 2.** Significance tests of spending differential with and without remittances.

Expenditure Category	Mean	T-value
Expenditure_Shares	-396,363.6	(-0.64)
Expenditure_Building	-217,564.9***	(-3.72)
Expenditure_Donations	-168,583.7***	(-3.67)
Expenditure_Consumption	-33,128.8***	(-4.00)
Expenditure_Wedding	-69,541.4	(-1.03)
Expenditure_Business	-67,646.6***	(-5.25)
Expenditure_Funerals	-66,135	(-1.64)
Expenditure_Education	-33,692.6***	(-4.04)
Expenditure_Maintenance	-28,345.4*	(-2.09)
Expenditure_Hirepurchase	-10,593.8	(-0.27)
Expenditure_Savings	-23,894.0***	(-4.63)
Expenditure_Health	-19,719.9***	(-5.65)
Observation	441	

**Source:** The authors. *t* – Statistics in parentheses \**p* < 0.05, \*\**p* < 0.01, \*\*\**p* < 0.001

In (Table A3) of the Appendix, sensitivity analysis on the matching estimates based on Rosenbaum (2002) approach is presented. The essence of this analysis is to show that there is no hidden bias due to unobservable factors in the estimation of the impact of remittances on welfare outcomes. This is a strong identifying assumption on which impact evaluation using treatment effect has come to depend (Becker & Caliendo, 2007). If hidden bias is present, two households with similar characteristics have differing chances of receiving remittances. The table reports different values of gamma and two matched households have the same probability of receiving treatment (in this case remittances) if gamma is one. This is the base scenario which shows no hidden bias. The p-values show that gamma value of 1 is statistically significant showing that there is significant treatment effect and that the results are less sensitive to the influence of unobserved characteristics (Cox-Edwards & Rodriguez-Oreggia, 2006). This is strong evidence that remittances have significant positive impact on development outcomes especially on household welfare. Based on the sensitivity analysis, it is not the case that the households that received remittances in this dataset are those that *apriori* had higher welfare outcomes.

(Table 3) presents the PSM results from the three matching estimators used. As observed, the results are pretty very close in all the outcome variables and between matching methods except in one or two cases. The estimated impact of remittances on poverty shows that household poverty is lower by between 30.3% and 33.6% considering the results from all the three matching estimators. This difference in poverty between the recipients and non-recipients of remittances is statistically significant. This means that households that receive remittances in Nigeria are associated with lower poverty. This finding is consistent with most of the postulates in the literature that remittance receipts have significant impact on poverty reduction among households in developing countries. For instance, in eleven Latin American countries, Acosta et al. (2007a), observed that regardless of the counterfactual-used remittances appear to lower poverty levels in most recipient countries. Similar findings were observed in Fiji and Tonga by Brown et al. (2014). The authors found that both the extent and depth of poverty is considerably



**Table 3.** Propensity score matching results of the impact of remittances on development outcomes at migrants home areas.

Variable	Stratification Matching				Kernel-Based Matching				Nearest Neighbor Matching			
	Treated	Control	ATT*	T-Stat	Treated	Control	ATT	T-Stat	Treated	Control	ATT	T-Stat
Poverty	138	291	-0.303**	-6.805	139	290	-0.315**	-7.692	139	156	-0.336**	-5.442
Educational_Expenditure	138	291	30,591.21*	3.832	139	290	29,148.42*	3.266	139	130	19,155.89*	2.464
Healthcare_Expenditure	138	291	18,588.36**	4.425	139	290	17,884.1**	4.169	139	153	13,736.18*	2.924
Consumption_Expenditure	138	291	27,510.57*	2.664	139	290	26,057.71*	2.967	139	154	7282.12	0.591
Business_Expenditure	138	291	66,321.96**	5.065	139	290	63,571.52*	3.454	139	75	59,203.92**	4.017
Investment (Shares, land & building)	138	291	186,000.0**	4.098	139	290	202,000.0*	2.949	139	51	205,000.0*	3.85
Wedding_Expenditure	138	291	18,745.16	0.628	139	290	27,718.55	0.276	139	15	52,649.29	0.661
Funeral_Expenditure	138	291	52,643.65*	2.407	139	290	39,874.39	0.735	139	27	31,974.95	0.773
Funeral_Expenditure	138	291	34,776.72*	3.164	139	290	33,585.62*	2.044	139	60	33,641.7*	2.68
Donations	138	291	179,000.0*	3.823	139	290	168,000.0*	2.526	139	72	168,000.0*	3.824
Savings	138	291	22,368.89**	4.034	139	290	22,609.1**	3.915	139	98	18,943.11*	2.996

\*ATT = average treatment on the treated

lower with migration and remittances in comparison with the two: 'without migration and remittances' scenarios.

We extended the analysis by looking at the remittances' impact on specific types of household expenditure that are central to measuring household welfare in addition to poverty. Monetary measure of poverty is a summary of average household welfare and aggregation may mask how remittances affect household expenditure components say, in the last 12 months. These expenditure components captured in the survey are household education expenditure (Educational\_Expenditure), health expenditure (Health\_Expenditure), household consumption expenditure (Consumption\_Expenditure), household expenditure in business enterprise (Business\_Expenditure), and household investment (Investment: such as building construction, land acquisitions, purchase of shares, etc). Other expenditure categories captured include wedding/dowry (Wedding\_Expenditure), funerals (Funeral\_Expenditure), upkeep of other relations (Expenditure\_Maintenance), donations (Donations), and savings (Savings).

The results show that there is a statistically significant positive impact of remittances on the components of household expenditure except expenditures on wedding and funerals, which are not significant when the matching was computed with kernel and nearest neighbour algorithm. More specifically, households that receive remittances spent about NGN30,000 (\$150) higher, on average, on education per annum compared to households that did not receive. This means that such households are more disposed to provide quality education to their children even to train them at higher levels of education. Acosta et al. (2007b), observed a similar pattern of remittance spending on education in eleven Latin American countries.

The results further reveal that households that receive remittances spend between NGN14,000 (US\$70) and NGN19,000 (US\$95) more on health per annum compared to households that do not receive remittances. This does not imply that households that receive remittances have better health outcomes compared to non-recipients. Rather higher expenditure may increase their capacity to pay for healthcare when needed, especially from professional providers. The impact of remittances on consumption expenditure is marginally significant and the estimated impact closer with stratification and kernel matching but not statistically significant (with wide departure) when nearest neighbour matching was used. Hence, this impact is not robust to different matching estimators and should be interpreted with caution. Two related expenditure components that are impacted positively and significantly by remittances receipts are household business expenditure and household investment.

Furthermore, the results show that households that receive remittances invest between NGN186,000 (US\$1,240) and NGN205,000 (US\$1,367) more in building constructions, land acquisitions and also invest over NGN60,000 (US\$400) more in household business enterprise compared to non-recipient households. These differences are also statistically significant. This finding that remittance recipient households spend more on building constructions and land acquisitions is supported by the 'exchange' motive for remitting extensively discussed in Brown et al. (2014).

Finally, the results indicate that remittance-receiving households spend about NGN34,000 (US\$227) more on the upkeep of relatives, spend about NGN170,000 (US\$ 1,133) more on donations to community development projects, and have average annual saving that is between NGN19,000 (US\$127) and NGN22,000 (US\$147) higher compared

to the households that did not receive remittances. In Nigeria, the upkeep of other relations is of one the key objectives for which migrants send money home, regardless of where they are currently residing.

## Discussion

Overall, there are three main concluding remarks from the empirical findings. The first remark is that migration within the Nigeria context can be seen as part of a broader household livelihood strategy aimed at spreading risks, diversify income and overcome social, economic and institutional development constraints in places of origin. This is consistent with the New Economics of Labour Migration (NELM) literature pioneered by Stark (1978, 1991), Stark and Levhari (1982), Stark and Bloom (1985), and Taylor (1992) among others. Second, the pattern of spending between remittance recipient and non-recipient suggests that remittance inflows to Nigerian households are consistent with the 'altruistic' and 'self-interested' motives. As explained in Brown et al. (2014), in the case of altruism, the welfare of the recipient households comes first, and the migrant expects nothing in return. Altruism can take several forms such as to subsidize household consumption expenditure, upkeep of other family relatives, finance business start-up for those left behind, and cater for the educational and healthcare needs of those left behind. On the other hand, in the case of 'self-interest' or what Brown et al. (2014), termed 'exchange', the migrant expects to receive something in return for the remittances. For instance, they may expect the recipient households to invest in assets acquisition in anticipation of their eventual return to their home town or village as evident from the findings. It could also take form of donations and support for funerals on migrants behalf to largely enhance prestige or influence in the society or more still, to facilitate their reintegration into their support networks.

## Conclusion and policy implications

Nigeria is currently ranked as Africa's top remittance destination country and the world's fifth-highest recipient nation with estimated official inflows of about US\$22 billion. However, very little is known about the development outcomes of this large foreign inflow especially in the migrants' originating areas. Using a new dataset involving 450 remittance recipient and non-recipient households collected in two states in Nigeria, the study finds that remittance income has significant impact on household poverty reduction and in general, there is significant expenditure differential between remittance-receiving households and non-remittance receiving households using three PSM algorithm (i.e., stratification, kernel and nearest neighbour). These findings were tested for robustness using Rosenbaum sensitivity analysis and found that there is no evidence of hidden bias in the matching methods employed to estimate the impact. Overall, there is strong evidence to suggest that it is not the case that households that received remittances in study are those that *a priori* had higher welfare outcomes. Based on this, it is reasonable to conclude that any observed difference in household expenditures between remittance recipient and non-recipient households is solely attributed to remittances.

More specifically, households that receive remittances spend about NGN30,000 or about US\$150 higher, on average, on education per annum compared to households that did not receive. Similarly, households that receive remittances spend between NGN14,000 (US\$70) and NGN19,000 (US\$95) higher on healthcare per annum compared to households that do not receive remittances. The same applies to investment spending. Households that receive remittances invest between NGN186,000 (US\$1,240) and NGN205,000 (US\$ 1,366.7) more in building constructions and land acquisitions and also invest over NGN60,000 (US\$400) more in household business enterprise compared to non-recipient households. These differences are also statistically significant when the matching was computed with all three algorithms used in the estimation. These findings therefore support the two major assumptions often advanced in favour of remittances that is, 'altruism' and 'exchange'. However, the empirical findings suggest that 'exchange' is the most dominant motive for migrants' remittances to Nigerian households.

A number of key policy implications can be drawn from these findings. (1) Given the importance of remittance income for communal and national developments in Nigeria, implementing pro-poor policies based on inaccurate remittance statistics as the case with Nigeria, may result in policy outcomes that do not harmonize actual remittance potentials in the country. Efforts are therefore needed to harmonize actual remittance statistics in Nigeria. This may include, for example, enacting into law the draft 2007 draft national policy on migration that will formally operationalised the Agency for Migration, Refugees and Internally Displaced Persons. This agency will be responsible for coordinating migration and remittance statistics in Nigeria. (2) The pro-investment nature of remittance expenditures especially in the migrants' originating areas calls for policy programs geared towards attracting migrants' investment in home areas. This may include, for example, schemes similar to the Mexican '*trepuruno*' (three for one) program, introducing tax rebate packages for migrants, or even encouraging export promotion zones especially for migrant investors as obtained in Pakistan. Also, exploring the idea of 'diaspora bonds' financing will not only foster national, regional and community development in Nigeria, but will equally mobilize and integrate Nigerians in the diaspora into the political development of the nation.

### Limitations of the study

There are several limitations to the study. First, as we mentioned earlier, given the restricted geographical coverage of the survey, observed trends in the data may not be considered as evidence of wider national trends in remittance spending. Nonetheless, the data provide a unique opportunity to better understand how remittances are typically utilized by recipient households in the Southeast Geo-political zone of Nigeria: a region known for large inflow of remittances. Second, the absence of data on household alternative income sources other than remittance income, limits the extent to which standard regression tools could be used in the analysis. For instance, if we had this information, controlling for income from alternative income sources would have revealed whether NGN1 of remittances is utilized differently from NGN1 of other income. Though the PSM technique attributes observed differences in household expenditure solely to remittance income, exploratory regression analysis would have greatly enriched the findings. Third, and lastly, our failure to uncover significant impact of remittances on household consumption expenditure is contrary to many previous findings using standard econometrics estimation. This seems to



suggest that, in addition, to using randomized controlled trial models for this kind of data, standard regression tools are also needed to complement and validate the analysis.

## Notes

1. Defined in the study as a household with a migrant currently away and/or who receive international remittances (i.e., within Africa and outside Africa).
2. Defined in the study as a household with no migrant of either kind, or who do not receive remittances.
3. We used the 'Recall Approach' in which case, respondents were asked to report how much they spent on different categories of consumption goods and services in a certain period.
4. This was the actual sample size agreed at the onset of the study for each country that the budget could sustain.
5. It might be possible that households with migrants have certain advantages over non-migrant households in terms of incomes, education, access to information, social networks etc., that influences the likelihood of having a migrant, and in turn, determine the size of migrant earnings at the destination country. If this is so, then a potential selection bias is apparent which means that we cannot directly compare spending between recipients and non-recipients and attribute the differences to remittance income alone. To correct this potential source of bias in the dataset, it is therefore necessary to use the propensity score matching (PSM) technique. The idea behind PSM is to pair individuals that receive remittances with other individuals that are like them in every other aspect except for remittances so that any observed difference is solely attributed to remittances (Cox-Edwards & Rodriguez-Oreggia, 2006; Rosenbaum & Rubin, 1983).

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The authors declare that they have no conflict of interests.

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## Ethical approval

Ethical approval for the study was sort and obtained from the Research Ethics Committee of the University of Nigeria, Nsukka. All procedures performed in the study involving human participants were in accordance with the ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments.

## Informed consent

All participants provided informed written consent.

## References

- Acosta, P., Calderon, C., Fajnzylber, P., & Lopez, J. (2007a). *What is the impact of international remittances on poverty and inequality in Latin America?* (World Bank Research Working Paper No. 4249). The World Bank.
- Acosta, P., Fajnzylber, P., & Lopez, J. (2007b). *The impact of remittances on poverty and human capital: Evidence from Latin American household surveys* (World Bank Research Working Paper No. 4247). The World Bank.
- Adams, R. (1989a). Remittances, investment and rural accumulation in Pakistan. *Economic Development and Cultural Change*, 41(1), 155–173. <https://www.jstor.org/stable/10.1086/452390>
- Adams, R. (1989b). Workers' remittances and inequality in rural Egypt. *Economic Development and Cultural Change*, 38(1), 45–71. <https://doi.org/10.1086/451775>
- Adams, R., & Page, J. (2005). Do internal migration and remittances reduce poverty in developing countries? *World Development*, 33, 1645–1669. doi:10.1016/j.worlddev.2005.05.004.
- Adams, R., Cuecuecha, A., & Page, J. (2008). *The impact of remittances on poverty and inequality in ghana* (World Bank Policy Research Working Paper No. 4732). The World Bank.
- Adams, R., & Page, J. (2003). Poverty, inequality and growth in selected middle east and North Africa countries, 1980–2000. *World Development*, 31(12), 2027–2048. <https://doi.org/doi.org/10.1016/j.worlddev.2003.04.004>
- Adams, R., & Page, J. (2004). Do international migration and remittances reduce poverty in developing countries? *World Development*, 33(10), 1645–1669. <https://doi.org/10.1016/j.worlddev.2005.05.004>.
- Adenutsi, D. (2011). *Do remittances alleviate poverty and income inequality in poor countries?* (Empirical evidence from sub-Saharan Africa. MPRA Paper No. 37130). Munich University Library. <http://mpra.ub.uni-muenchen.de/37130/>
- Adenutsi, E. D. (2014). Macroeconomic determinants of workers' remittances and compensation of employees in sub-Saharan Africa. *The Journal of Developing Areas*, 48(1), 337–360. <https://doi.org/10.1353/jda.2014.0015>
- Amega, K. (2018). Remittances, education and health in sub-Saharan Africa. *Cogent Economics & Finance*, 6(1), 1516488. <https://doi.org/10.1080/23322039.2018.1516488>
- Anyanwu, J. (2011). *International remittances and income inequality in Africa* (AfDB Working Paper Series N° 135). African Development Bank.
- Bah, M., Cisse, S., Diyamett, B., Diallo, G., Lerise, F., Okali, D., Okpara, E., Olawoye, J., & Tacoli, C. (2003). Changing rural-urban linkages in Mali, Nigeria and Tanzania. *Environment and Urbanization*, 15(1), 13–23. <https://doi.org/10.1177/095624780301500104>
- Baldé, Y. (2009). *Migrants' remittances and economic growth in sub-Saharan Africa*. Université de Limoges. [http://www.umdcipe.org/conferences/Maastricht/conf\\_papers/Papers/Remittances\\_and\\_Growth\\_in\\_SSA.pdf](http://www.umdcipe.org/conferences/Maastricht/conf_papers/Papers/Remittances_and_Growth_in_SSA.pdf)
- Becker, O. S., & Caliendo, M. (2007). Sensitivity analysis for average treatment effects. *The Stata Journal*, 7(1): 71–83. <https://doi.org/10.1177/1536867X0700700104>

- Brown, R., Connell, J., & Jimenez-Soto, E. (2014). Migrants' remittances, poverty and social protection in the South Pacific: Fiji and Tonga. *Population, Space and Place*, 20(5), 434–454. <https://doi.org/10.1002/psp.1765>
- Chukwuone, N., Amaechina, A., Enebeli-Uzor, S., Iyoko, E., & Okpukpara, B. (2012). *Analysis of impact of remittance on poverty in Nigeria* (PMMA Working Paper No. 2012–09). PEP Research Network.
- Cox-Edwards, A., & Rodriguez-Oreggia, E. (2006). *The effect of remittances on labour force participation: An analysis based on Mexico' 2002 ENET*. [http://conference.iza.org/conference\\_files/worldb2006/rodriguez-oreggia\\_e2730.pdf](http://conference.iza.org/conference_files/worldb2006/rodriguez-oreggia_e2730.pdf)
- Ellyne, M., & Mahlalela, N. (2017, July). *The impact of remittances on poverty in Africa: A cross-country empirical analysis* [Paper presentation]. The 14th African Finance Journal Conference, Victoria Fall, Zimbabwe.
- Fonta, M. W., & Agu, C. C. (2013). *International remittances, poverty and inequality: The West African case* (IDRC Research Report No.: IDL-52315). International Development Research Centre (IDRC), Ottawa, Canada. <http://hdl.handle.net/10625/52315>
- Fonta, M. W., Ayuk, E. T., Chukwu, O. J., Onyukwu, E. O., Agu, C. C., & Umenwa, O. I. (2015). Dynamics of remittances utilization by Nigerian households. *Progress in Development Studies*, 15(4), 343–357. <https://doi.org/10.1177/1464993415592742>
- Ketkar, S. L., & Ratha, D. (2007, May 23). *Development finance via diaspora bonds: Track record and potential* [Paper presentation]. The World Bank Migration and Development Conference, Washington, DC.
- Lucas, R., & Stark, O. (1985). Motivations to remit: Evidence from Botswana. *Journal of Political Economy*, 93(5), 901–918. <https://www.journals.uchicago.edu/doi/10.1086/261341>
- Makram, G., & Montassar, Z. (2014). *The causal relationship between remittances and poverty reduction in developing country: Using a non-stationary dynamic panel data*. *Atlantic Review of Economics* (Vol. 1). Colegio de Economistas de A Coruña, A Coruña.
- Mughal, M. Y. (2012). Remittances as development strategy: Stepping stones or slippery slope? *Journal of International Development*, 25(4), 583–595. <https://doi.org/10.1002/jid.2891>
- Ncube, M., & Brixiova, Z. (2013). *Remittances and their macroeconomic impact: Evidence from Africa* (AfDB Working Paper Series N° 188). African Development Bank. [https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Working\\_Paper\\_188\\_-\\_Remittances\\_and\\_their\\_Macroeconomic\\_Impact\\_Evidence\\_from\\_Africa.pdf](https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Working_Paper_188_-_Remittances_and_their_Macroeconomic_Impact_Evidence_from_Africa.pdf)
- Nwosu, E., Fonta, W., Aneke, G., & Yuni, D. (2012). Microeconomic determinants of migrant remittances to Nigerian households. *Economics Bulletin*, 32(4), 3425–3438. <https://econpapers.repec.org/RePEc:ebl:ecbull:eb-12-00711>
- Poirine, B. (1997). Theory of remittances as an implicit family loan arrangement. *World Development*, 25(4), 589–612. [https://doi.org/10.1016/S0305-750X\(97\)00121-6](https://doi.org/10.1016/S0305-750X(97)00121-6)
- Rosenbaum, P. R. (2002). Covariance adjustment in randomized experiments and observational studies. *Statistical Science*, 17(3), 286–327. <http://dx.doi.org/10.1214/ss/1042727942>
- Rosenbaum, P., & Rubin, D. B. (1983). The central role of propensity score in observational studies for causal effects. *Biometrika*, 70(1), 41–45. <https://doi.org/10.1093/biomet/70.1.41>
- Singh, R., Lee, K.-W., & Markus Haacker, M. (2009). *Determinants and macroeconomic impact of remittances in sub-Saharan Africa* (IMF Working Paper No. 09/216). International Monetary Fund. <https://doi.org/10.5089/9781451873634.001>
- Singh, R. J., Haacker, M., Lee, K.-W., & Maëlan Le Goff, M. (2011). Determinants and macroeconomic impact of remittances in sub-Saharan Africa. *Journal of African Economies*, 20(2), 312–340. <https://doi.org/10.1093/jae/ejq039>
- Stark, O. (1978). *Economic-demographic interactions in agricultural development: The case of rural-to-urban migration*. Rome: U.N. Food and Agriculture Organization.
- Stark, O. (1991). *The migration of labour*. Blackwell Publishers.
- Stark, O., & Bloom, D. (1985). The new economics of labor migration. *The American Economic Review*, 75(2), 173–178. <http://www.jstor.org/stable/1805591>
- Stark, O., & Levhari, D. (1982). On migration and risk in LDCs. *Economic Development and Cultural Change*, 31, 191–196. <https://www.journals.uchicago.edu/doi/10.1086/451312>

- Taylor, J. (1992). Remittances and inequality reconsidered: Direct, indirect and intertemporal effects. *Journal of Policy Modelling*, 14(2), 187–208. [https://doi.org/10.1016/0161-8938\(92\)90008-Z](https://doi.org/10.1016/0161-8938(92)90008-Z)
- Taylor, J., Mora, J., & Adams, R. (2005). *Remittances, inequality and poverty: Evidence from rural Mexico* [Unpublished manuscript]. Department of Agricultural Economics, University of California.
- Udah, H. (2014). The African diaspora in Australia and African renaissance: Harnessing diaspora resources and encouraging diaspora investments and linkages with Africa. *AFSAAP36th Annual Conference Proceedings, 2014*(36), 1–15. [https://afsaap.org.au/assets/hyacinth\\_udah.pdf](https://afsaap.org.au/assets/hyacinth_udah.pdf)
- UNECA. (2014). *Domestic resource mobilization* (UNECA Issues Paper No. ECA/ADF/9/2). The United Nations Economic Commission for Africa.
- Urama, N., Nwosu, E., Yuni, D., & Aguegbah, E. (2016). International migrant remittances and labour supply in Nigeria. *International Migration*, 55(1), 37–50. <https://doi.org/10.1111/imig.12289>
- World Bank. (2018). *World bank migration and remittances data*.
- World Bank. (2019). *Data release: Remittances to low- and middle-income countries on track to reach \$551 billion in 2019 and \$597 billion by 2021*. <https://blogs.worldbank.org/peoplemove/data-release-remittances-low-and-middle-income-countries-track-reach-551-billion-2019>
- Yang, D. (2004). *International migration, human capital, and entrepreneurship: Evidence from Philippine migrants* (University of Michigan Discussion Paper No. 531). Retrieved January 5, 2014, from <http://fordschool.umich.edu/rsie/workingpapers/Papers526-550/r531.pdf>
- Yang, D. (2011). Migrant remittances. *Journal of Economic Perspectives*, 25 (3): 129–52. doi:10.1257/jep.25.3.129
- Yang, D., & Martinez, C. A. (2005). *Remittances and poverty in migrants' home areas: Evidence from the Philippines* [Unpublished Manuscript]. Department of Economics, University of Michigan.

## Appendix

**Table A1.** Summary statistics and mean difference of the match (pre-treatment) variables.

Variable	Mean	Mean	Mean	T-Statistic
	Control	Treated	Difference	
hhsiz	4.30897	4.489209	−0.18	(−0.78)
sex	1.292359	1.208633	0.0837	−1.85
agecat	3.578073	4.129496	−0.551***	(−4.90)
wksit	2.51495	2.582734	−0.0678	(−0.61)
edatt	2.498339	2.539568	−0.0412	(−0.27)
marstat	2.481728	2.42446	0.0573	−0.59

t statistics in parentheses \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

**Table A2.** Summary statistics of the covariates after matching.

Variable	Mean		T-Test	
	Treated	Control	% Bias	p > t
hhsiz	4.8926	5.0308	−6.7	0.601
sex	1.1818	1.1336	12	0.306
agecat	4.157	4.0839	7.1	0.558
wksit	2.6529	2.4565	16.6	0.209
edatt	2.4959	2.6498	−10.5	0.422
marstat	2.405	2.2919	13.1	0.271

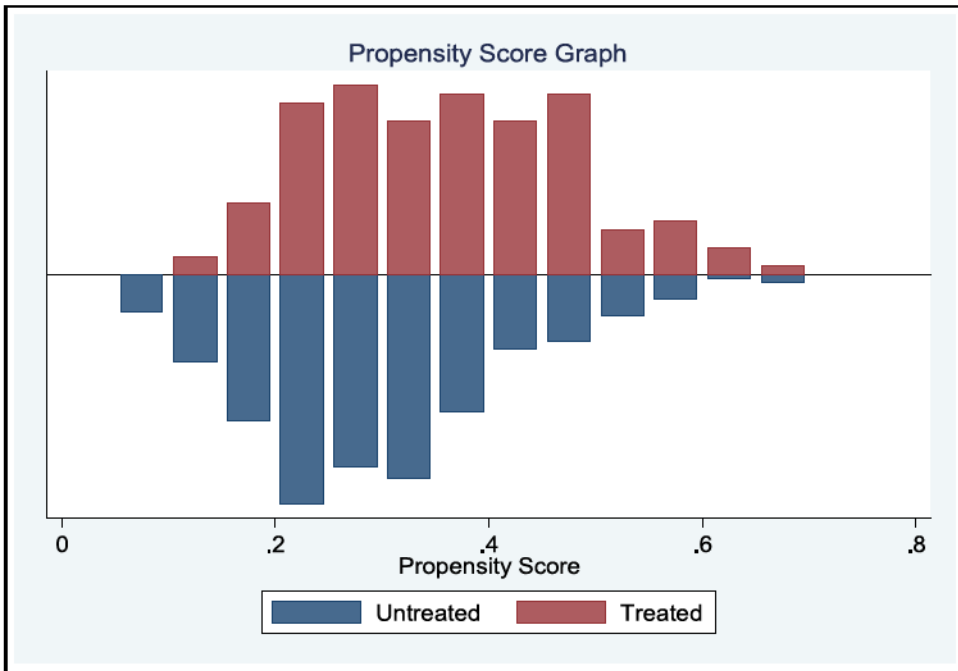


**Table A3.** Rosenbaum bounds sensitivity analysis. Treatment = remittance recipients.

Outcomes	Gamma	P-values		Hodges-Lehmann Point Estimates		95% Confidence Intervals	
		Upper	Lower	Upper	Lower	Upper	Lower
hhexped	1	0.000193	0.000193	18377.4	18377.4	7821.9	29887.3
	1.2	0.003536	0.00	13883.4	23421.1	3488.98	35699.3
	1.4	0.023465	0.00	9824.42	27421.8	135.939	40698.6
	1.6	0.083088	0.00	6240.41	31599.4	-3058.5	44733.1
hhexpht	1	0.00	0.00	9841.7	9841.7	5742.1	14375.4
	1.2	0.000095	0.00	7942.18	11987.2	3597.47	16705.3
	1.4	0.001399	0.00	6420.76	13837.2	1858.99	19108.1
	1.6	0.009138	0.00	4851.82	15255.1	739.701	21439.8
hhexpcon	2	0.091619	0	2405.11	18368.7	-1220.27	26088.6
	1	0.002837	0.002837	16295.9	16295.9	4381.61	28916.6
	1.2	0.03236	0.000104	10573.8	21887.8	-769.125	35526.3
	1.4	0.139499	3.00E-06	5606.06	27094.9	-4930.91	41609.6
hhexpbus	1.6	0.335202	7.20E-08	2243.4	31735.5	-8605.51	46432.3
	1	1.40E-07	1.40E-07	39551.4	39551.4	23076.4	59726.1
	1.2	4.50E-06	2.20E-09	32665.6	46522.4	18559.7	67810.5
	2.6	0.031962	0	12956.2	80970.4	-781.425	112952
hhexpinv	2.8	0.052088	0	11161.5	84592.1	-2440.26	120047
	1	0.00272	0.00272	121577	121577	29230.5	218933
	1.2	0.016104	0.00029	88949.3	154274	6123.45	253630
	1.4	0.052987	0.000029	63842.6	177237	-14314.8	284425
hhexpwd	1.6	0.121117	2.80E-06	43577	201746	-29772.2	314126
	1	0.284747	0.284747	-66221.1	-66221.1	-271513	60301.7
	1.2	0.186158	0.401225	-111806	-25185.1	-285815	75428
	1.8	0.050309	0.675369	-221320	30476	-375352	113604
hhexpfun	2	0.032413	0.738869	-229242	33049	-509887	129691
	1	0.011899	0.011899	31920.8	31920.8	3603.94	96615
	1.2	0.030615	0.003818	24785.9	40505.5	-1533.34	131474
	1.4	0.059903	0.001226	18302.8	47810.4	-5982.02	190997
hhexpmor	1.8	0.144797	0.000127	11619.4	66031.9	-15378.5	230776
	1	0.124486	0.124486	3955.9	3955.9	-3105.94	12499.3
	1.2	0.2954	0.037734	1712.67	6343.67	-5128.76	15934.3
	1.4	0.491524	0.010248	32.8018	8550.72	-7328.79	19975.9
hhexpdon	1.6	0.664907	0.002591	-1796.25	10854.1	-8798.54	23854.7
	1	0.012977	0.012977	6122.52	6122.52	703.136	18020.6
	1.2	0.050302	0.002325	3682.99	8653.87	-949.113	26045.1
	1.4	0.123392	0.000391	2018.45	11242.1	-1658.92	35700
hhexpsav	1	5.40E-07	5.40E-07	13212.6	13212.6	8358.98	19998.9
	1.2	0.000024	4.90E-09	11050.3	15516.1	6310.28	24294.7
	1.4	0.000335	4.20E-11	9445.59	18067.3	4160.69	27951.3
	2	0.026123	0	5464.78	25598.6	-57.4919	35810.8
Poverty	2.2	0.05901	0	4266.86	27868.7	-1030.31	38191.7
	Gamma			Q_mh+	Q_mh-	p_mh+	p_mh-
	1			6.47455	6.47455	4.80E-11	4.80E-11
	1.2			7.2912	5.69409	1.50E-13	6.20E-09
	1.4			7.99323	5.04357	6.70E-16	2.30E-07

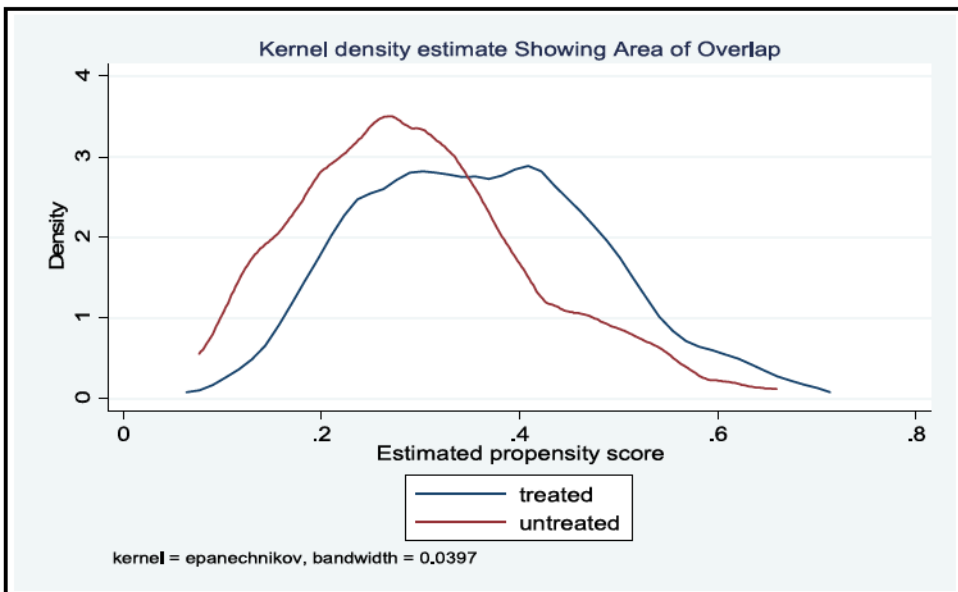
Source: Authors' computations.

\*Mantel-Haenszel (1959) bounds are reported for poverty (a dichotomous variable) using mhbound command in Stata. The estimates are assumed to encompass zero at tau value of 1 using the 95% confidence interval since zero is lying on the critical value. This shows no hidden bias in the estimation of the effect of remittances on poverty.



**A: Pscore Graph**

Figure A1. Pscore graph.



**B: The region of common support is [.10350339, .67393489]**

Figure A2. The region of common support is [.10350339, .67393489].