

ORIGINAL ARTICLE

International migrant remittances and labour force participation in Nigeria

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Abstract

This study examines the effect of remittances inflow to Nigeria on labour force participation in the country using the propensity score matching and Heckman two-step benchmark model. With data sourced from Nigeria's 2015/16 General Household Survey, results reveal that receipt of remittances increased both labour force participation for non-farm economic activities and labour force participation in urban areas, perhaps as a result of investing received remittances in new business ventures. In addition, remittance inflows raised economic activeness of the younger members of the labour force who constituted a greater percentage. The study recommends the proper functioning of institutions aimed at facilitating remittance inflows as well as enhancing the utilization of such remittances in industry-based business start-ups.

KEYWORDS

general household survey, labour force participation, Nigeria, remittance inflow

1 | INTRODUCTION

Remittance inflow is the second-highest source of foreign exchange after petro-dollar and is the highest source of unearned foreign capital inflow in Nigeria. For instance, in 2017, remittance inflow in Nigeria totalled US\$22 billion while foreign portfolio and direct investments stood at US\$12.2 billion (National Bureau of Statistics, 2018; World Bank, 2018). Nigeria is thus the biggest recipient of remittance in sub-Saharan Africa and the sixth highest recipient of remittance inflow in the world (World Bank, 2018). On the other hand, Nigeria labour participation rate lags behind the world and regional rate. For example, World Bank (2018) shows that total labour participation rate was 55.15 per cent in 2017 which is below the world and sub-Saharan African averages of 61.94 per cent and 68.29 per cent respectively.

Globally, remittance inflow is acknowledged as a significant source of capital flows as well as considerable catalysts for economic development, especially in developing countries, because they are less volatile, provide a stable inflow of resources, and are more dependable than other sources of capital flows including development aid, foreign portfolio, and foreign direct investments (Anyanwu & Erhijakpor, 2010; Olubiyi, 2014). Remittance can have both direct and indirect trickle-down effects on both households and national wealth. As noted by Barua, Majumder, and Akhtaruzzaman (2007) and Ajide and Raheem (2016), low-income countries (LICs), Nigeria inclusive, are major destinations for migrant remittance inflows. Characteristically, LICs have abundant labour supply but shortage of capital. Barua et al. (2007) argue that remittance inflows can

The authors are highly indebted to participants at the Afriheritage Conference on the Economics of Sustainable Growth in Africa held in Enugu State, Nigeria in 2018 for their valuable contributions. Also, the suggestions received from the reviewers are acknowledged.

optimize the sub-optimal labour-capital ratio in LICs as well as generate employment in recipient countries through capital accumulation and reinvestment of remittance-induced savings. Remittance can also engineer self-employment and other productive activities (Mabrouk & Mekni, 2018). Remittance is a non-wage income which may substitute for wage. Chami et al. (2008) note that increased remittances can raise the reservation wages, which further lead to a decline in labour force participation rate, especially when the prevailing wage rate is lower than the worker's reservation wage. The neoclassical work/leisure model also predicts that remittance inflow may increase a worker's appetite for leisure by decreasing the costs of leisure through remittance non-wage income (Nwokoye, 2017).

Conversely, remittance inflows can be deleterious to LICs. For instance, Amuedo-Dorantes and Pozo (2004) maintain that remittance inflows can hamper economic growth through Dutch disease syndrome. Exchange rate appreciation can lead to a decline in net exports and as imports become relatively cheaper, demands for domestic commodities decline, causing declines in domestic production and labour demand. Barai (2012) asserts that the net effect of remittance inflow on the labour supply of an economy depends on the utilization of such inflows and economic fundamentals of a country. As emphasized by the neoclassical growth model, economic growth is contingent on technical efficiency and the capital-labour ratio. Thus, in technology and capital-deficient economies, decrease in labour supply is no doubt a growth decelerator. This, therefore, calls for attention directed towards examining the effect of remittances on labour force participation in top remittance-receiving countries such as Nigeria.

Although many empirical studies in Nigeria have shed light on the effects of remittances on economic growth (Iheke, 2012; Oladapo, Alao, & Kayode, 2016; Oyenike, Azuh, & Yartey, 2015) and its effect on poverty (Ajayi et al., 2009; Babatunde & Martinetti, 2011; Odozi, Awoyemia, & Omonona, 2010), there is a dearth of literature on the effect of remittances on labour force participation in Nigeria. As far as we know, the only attempt made to study the implication of remittance inflow for labour supply in Nigeria is Urama, Nwosu, Yuni, and Aguegbogh (2016) which utilized the 2013 Nigerian General Household Survey (GHS). Thus, this study is unique in several ways. Since, the launch of GHS in 2016, no study in Nigeria has reinvestigated the labour participation behaviour of remittance recipient households in Nigeria. Given that there are pronounced changes in unemployment rate, labour force participation rate, sources of start-up capital as well as certain demographics in the 2013 and 2016 reports, there is need to re-examine the labour participation of remittance recipient households in Nigeria. This study, therefore, sought to re-examine the impact of remittance inflow on labour participation of remittance recipient households in Nigeria using the 2016 GHS. Second, we evaluated the impact of remittance inflow on the labour supply of persons with pre-tertiary and post-secondary educational qualifications. Since educational attainment could have implications for labour supply through adjustment of the individual worker's reservation wage benchmark, it could also be worthwhile to examine the impact of remittance inflow on the labour supply of workers with pre-tertiary and post-secondary educational qualification. Urama et al. (2016) did not, however, focus on this additional frontier. Third, we further examined the impact of remittance inflow on the labour supply behaviour of households that engaged in farm and non-farm activities. Given the increasing volume of remittance flow to Nigeria, a study on remittances and labour force participation merits an investigation. Specifically, our study evaluates the impact of remittance inflow on labour force participation of Nigerian households with special focus on the nature of economic engagement, workforce educational attainment, age of the workforce and spatial location of the workforce, using the 2016 Nigerian GHS.

To achieve our aim, the remainder of our paper is structured thus: Section 2 presents the stylized facts on remittance inflow in Nigeria. Section 3 contains the literature review while Section 4 highlights the method employed by our study. Section 5 presents and discusses the findings of the study, while Section 6 provides policy recommendations and concludes the study.

2 | BRIEF STYLIZED FACTS ON REMITTANCE INFLOW IN NIGERIA

Nigeria is the biggest recipient of remittances in sub-Saharan Africa. In 2017, remittance inflow in sub-Saharan Africa and Nigeria was recorded at US\$42.72 billion and US\$22 billion respectively. In other words, Nigeria received 51.5% of the total remittance to sub-Saharan Africa. Nigeria's share of remittance inflow in 2017 also constituted 4.2% and 3.8% of total remittance to LICs and global remittance respectively (World Bank, 2018). This makes Nigeria the highest migrant remittance recipient in Africa and the sixth highest recipient of remittance in the world.

As shown in Figure 1, Nigeria's remittance inflow stood at US\$2.3 billion in 2004 and was an average of US\$17 billion in 2005–2007. Figure 1 also shows that remittance inflow to Nigeria rose tremendously in 2004 because of the banking sector reforms that improved the reporting system of remittance as well as the formalization of the informal channels. The increase could also be attributed to the advancement in ICT that promotes growth in money transfer as

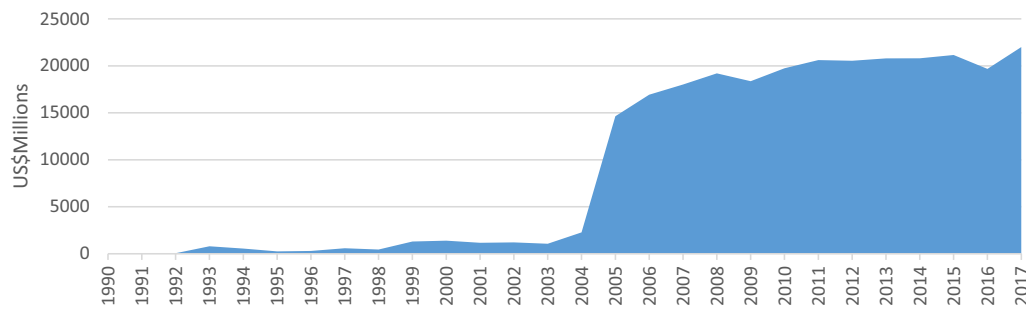


FIGURE 1 Nigeria's remittance inflow. *Source:* World Bank (2018)

well as the enhanced interest of the migrants in remitting more money home. Remittance inflows from Nigerians in Diasporas were US\$19 billion and US\$20 billion in 2008 and 2010 respectively. It advanced to an average of US\$21 billion in 2011–2014 and relatively maintained the same value in 2015. Since 2014, remittances have surpassed official development assistance (ODA) and capital importation (foreign direct investment, foreign portfolio investment and other investments) ranking second only to oil as a major foreign exchange earner for Nigeria. Although migrant remittances declined slightly in 2016, it grew by 11.7 per cent from US\$19.636 billion to US\$21.967 billion in 2017.

Although aggregate remittance inflow to Nigeria trails behind India, Philippine, Mexico, China, and France, the remittance-GDP ratio of Nigeria is higher than that of all these five highest recipients of remittance except the Philippines, which had a remittance–gross domestic production (GDP) ratio of 10.46 as against Nigeria's 5.86 as at 2017 (see Table 1). This substantial inflow of remittance can be a source of capital augmentation for her production activities, which in turn has potentials of enhancing labour demand.

3 | LITERATURE REVIEW

3.1 | Theoretical literature

The neoclassical work/leisure trade-off model explains the decision of individuals to participate in the labour force, as well as the number of hours they are willing to work at the prevailing wage rate. In order to maximize utility, an individual has to make a rational decision on how to allocate time between leisure and work (Elu & Price, 2017; Nwokoye, 2017). For instance, every individual has 24 hr limited time in a day and this has to be allocated between leisure and work, meaning that the individual must trade off certain other activities (leisure) in order to increase the time he/she spends on work and vice versa. Thus, the decision of the individual to give more time to leisure than work depends not only on his/her real wage but also on his/her preference between leisure and work. These two effects on an

TABLE 1 Remittance-GDP ratio

	Remittance inflow US\$	World rank	Remittance (% of GDP)
World	580.49		0.73
Sub-Saharan Africa	42.72		2.61
India	68.97	1	2.65
Philippines	32.81	2	10.46
Mexico	32.27	3	2.80
China	28.67	4	0.23
France	24.89	5	0.96
Nigeria	22.00	6	5.86

Source: World Bank (2018).

individual's behaviour are categorized as *income and substitution effects*. If an *income effect* dominates individual preferences, then an increase in the wage rate makes an individual demand more leisure and there is a decrease in hours of work. On the other hand, if a *substitution effect* dominates individual preferences, then the individual increases their work hours and decreases leisure hours (Borjas, 2008; Nwokoje, 2017). The literature pinpoints various channels through which labour participation is influenced by remittances. First, remittances characterize a source of non-labour income for the left-behind and economic theory has noted that the income effect could engender a decrease in labour participation in the situation of improvement of non-labour income and vice versa (Airola, 2008). Hence, additional income from remittances can decrease the amount of labour the left-behind members would be willing to supply. Second, left-behind members of the households, particularly the youth, could decrease their labour participation by enrolling in higher education.

3.2 | Empirical literature

We classify empirical studies which have investigated remittances and the labour force dynamics into two: studies that find evidence that remittances may decrease the labour supply of recipients and studies that maintain a contrary view. For instance, employing household-level data for the Philippines and a probit regression technique, Rodriguez and Tiongson (2001) found that international migration reduced labour participation in migrant households. Maurizio and Denis (2007), Kim (2007), Narazani (2009), Hanson (2007) and Acosta, Lartey, and Mandelman (2009) also found that receiving remittances reduced recipients' labour market participation in Jamaica, Albania, Mexico and El-Salvador using computable general equilibrium, fixed effect regression, micro econometric two-sector labour supply model and the probit and Tobit model respectively. Similar results were obtained by Emilsson (2011) in Jordan using the probit regression technique, Justino and Shemyakan (2012) for Tajikistan using ordinary least squares and Tobit model, and Khan and Valatheeswaran (2016) for India using the instrumental variable approach. In addition, Chami, Ernst, Fullenkamp, and Oeking (2018) applied the generalized method of moments and obtained similar evidence in selected fragile states as well as low and middle-income countries.

In El Salvador, Acosta (2007) employed a probit model and two-stage least squares and found that labour force participation reduces for remittance-receiving women but not for men. Similarly, Binzel and Assaad (2012), exploring the nexus between migrant Egyptian men and their wives' labour supply back home, reported a significant decrease in labour supplied by their wives at home, while Urama et al. (2016) utilized propensity score matching and found that receiving remittances negatively affected the labour supply of the elderly, teenagers and self-employed in agriculture in Nigeria.

Contrary to the views above, Amuedo-Dorantes and Pozo (2005) showed that remittance sometimes decreases hours worked, but at other times it increases hours worked depending on household location, kind of work and recipient's gender. Employing panel data from 66 developing countries across Latin America, the Caribbean, Asia and the Pacific, Middle East, and Africa (Nigeria inclusive) over the period 1985–2005, Posso (2012) employed instrumental variable regression and found a positive significant relationship between remittances and aggregate labour supply. Karymshakov, Sulaimanova, and Sultakeev (2016) on the other hand did not find any strong support for the remittance-dependency behaviour of household members in the home country using a multinomial probit model and an instrumental variable approach.

Moreover, despite the position of Nigeria as the largest remittance-receiving country in Africa and the sixth largest at the global level, there is a paucity of studies on the impact of remittances on Nigeria's labour force participation. Studies such as Posso (2012) included Nigeria in its panel but country-specific results for Nigeria were not reported. Besides Urama et al. (2016), little evidence is available in the Nigeria context. To this end, our study extends the frontier of knowledge by examining the impact of remittance inflow on the labour force participation in Nigeria.

4 | RESEARCH METHOD

4.1 | Estimation technique

Apart from foreign remittance, there are other factors that can influence household labour force participation. To net out the impact of remittance on household labour supply, we recognize the need to perform counterfactual analyses in

order to ascertain what would have happened had remittance-receiving households not received remittances. To achieve this, a control group (the non-remittance receiving households) is compared with the treatment group (the remittance-receiving households). As noted by Caliendo and Kopeinig (2005), ensuring unbiased estimation requires that our control group should have every attribute of the treatment group except that it does not receive remittances.

Randomization guarantees unbiased estimation of treatment effects by ensuring that for each covariate, treatment-control groups will be balanced on average by the law of large numbers (Nwosu & Orji, 2017). But since receipt of remittance is not randomized, those who receive remittances may have dissimilar attributes from the non-recipients. Ensuring that treatment and control groups compared have similar attributes requires the use of propensity score matching (PSM) with an appropriate matching procedure (Díaz & Handa, 2005). The PSM can estimate the impacts of remittances on labour force participation of recipient households by pairing treatment and control units with similar attributes on the propensity score and other likely covariates and by discarding all unmatched units.

Implementation of the PSM requires that we first estimate the propensity score. According to Rosenbaum and Rubin (1983), the estimated propensity score $p(X)$, for subjects ($j = 1, \dots, K$) is the conditional probability of receiving a particular treatment given a vector of observed covariates x_i :

$$p(\mathbf{X}_j) = \Pr(D_j = 1/\mathbf{X}_j) = E(D/\mathbf{X}) \tag{1}$$

and

$$\Pr(D_j, \dots, \mathbf{X}_1, \mathbf{X}_2, \dots, \mathbf{X}_k) = \sum_{j=1}^K e(\mathbf{X}_j)^{d_j} \{1 - e(\mathbf{X}_j)\}^{1-d_j} \tag{2}$$

where $d_j = 1$ for treatment (that is “household receives remittance”), $d_j = 0$ for control (that is “household does not receive remittance”), and \mathbf{X}_j is the vector of observed covariates for the j th subject. Probability score, defined as the probability of a household receiving remittance conditional on a set of observed covariates, ranges from zero (0) to one (1). We estimated the propensity score using binary logistic regression procedure. The logistic regression model is defined as:

$$\ln \frac{e(x_j)}{1 - e(x_j)} = \ln \frac{\Pr(d_j = 1/x_j)}{1 - \Pr(d_j = 1/x_j)} = \alpha + \beta^T x_j \tag{3}$$

where:

$$e(x_j) = \Pr(d_j = 1/x_j)$$

$$e(X_j) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_j X_j$$

Suppose Y_1 represents the potential outcome conditional on receiving remittance, and Y_0 denotes the potential outcome conditional on not receiving remittance. Given that the propensity score, $p(X_j)$ is known, the average effect of treatment on the treated (ATT) can be estimated as follows:

$$ATT = E(Y_{1j} - Y_{0j}/D_j = 1) = E[E\{Y_{1j} - Y_{0j}/D_j = 1, p(X_j)\}] = E[E\{Y_{1j}/D_j = 1, p(X_j)\} - E\{Y_{0j}/D_j = 0, p(X_j)\}/D_j = 1] \tag{4}$$

However, to estimate ATT, it is required that the conditional independence assumption (CIA) and the confoundedness conditions should be satisfied. If the CIA holds, then

$$Y_0, Y_1 \perp D/X \tag{5}$$

where \perp denotes statistical independence.

Similarly, if confoundedness holds, then

$$Y_0, Y_1 \perp D/p(X) \tag{6}$$

The estimate of the propensity score is not enough to estimate ATT of interest. Given that the probability of observing two individuals with exactly the same value of propensity score is in principle zero (Becker & Ichino, 2002), obtaining the estimate of the propensity is therefore not sufficient to estimate the ATT. As a way of overcoming this problem, Becker and Ichino (2002) suggested the use of an appropriate matching method.

The commonest types of matching methods are the nearest-neighbour matching, radius matching, kernel matching and stratification matching. For this study, we applied the nearest-neighbour matching approach. The nearest-neighbour method involves matching each remittance-receiving household with a non-remittance-receiving household that has the closest propensity score. As noted by Ogunniyi, Oluseyi, Adeyemi, Kabir, and Philips (2017), one major advantage of nearest-neighbour matching is the lower variance which is achieved because more information is used.

The propensity score is estimated using covariates which define the various socio-demographic characteristics of remittance recipient households such as gender, household size, head of household, age, years of education, spatial location (rural and urban), marital status and nature of the economic activity.

Notice that the ATT equation is predicated on the assumption that the CIA holds. Greene (2006), however, argues that the CIA does not always hold. In the event that the CIA is violated, the PSM estimate of ATT might be subject to unobserved selection bias. Thus, to test for CIA assumption, we employed the Rosenbaum bounds (RB). This approach enables us to test for the validity of the CIA. According to Rosenbaum (2005), the RB method provides an estimate that indicates the extent to which the unobserved confounding variable makes ATT treatment effects statistically insignificant. Given that \mathbf{X} is a vector of covariates that determine the treatment outcome and there are individual k and j such that $\mathbf{X}_k = \mathbf{X}_j$, the ratio of their odds ratios is:

$$\frac{1}{\Psi} \leq \frac{\text{odds}(X_k)}{\text{odds}(X_j)} \leq \Psi \quad (7)$$

For $k = j$, $\mathbf{X}_k = \mathbf{X}_j$

If $\Psi \neq 1$, then individuals with similar characteristics do not have the same probabilities or odds of being selected into the treatment group and the CIA does not hold. However, if $\Psi = 1$, then the CIA holds.

The use of the Heckit two-stage model is also popular among researchers. The Heckit model does not require the CIA assumption and may not suffer from selection bias. However, it also suffers the limitation of the standard Heckman model. As noted by Puhani (2000), the Heckit two-stage model is estimated using limited information likelihood. In finite sample and asymptotic theory, full information maximum likelihood is believed to exhibit better statistical properties. Puhani (2000) also argued that the ordinary least squares (OLS) generated covariance matrix for the second-stage estimation is inconsistent. Furthermore, in the estimation of the canonical model, it is assumed that the errors are jointly normally distributed. If this assumption fails, the standard errors and t -statistics generated by the Heckit model could be inconsistent and hence not fit for inference.

Thus, we further utilize the Heckit model in addition to the PSM in the estimation of treatment effect. Suppose our model is:

$$y_i^* = \mathbf{X}_i \Omega_1 + \mu_{1i} \quad I = 1, \dots, n \quad (8)$$

where \mathbf{X} is a vector of covariates. Equation (8) estimates the effects of observed covariates on the decision to supply labour. However, there are individuals who naturally choose not to supply labour. Thus, the decision to supply labour is specified as:

$$d_i^* = \mathbf{Z}_i \phi_1 + \mu_{2i} \quad I = 1, \dots, n \quad (9)$$

Equation (8) represents the selection equation while Equation (9) is the outcome equation. \mathbf{Z} , which may include exactly the same covariates in \mathbf{X} , is a vector of attributes of labour suppliers who received remittance in the last 12 months. Essentially, if $d_i^* > 0$ then we observe $y_i = y_i^*$. Since OLS will most likely generate a biased estimate given that in some cases $E[\mu_1/z_i, d_i = 1] \neq 0$, the selection bias can be overcome by using the Heckit two-step procedure.

The Heckit procedure requires that we first estimate ϕ using maximum likelihood estimation probit which employs exclusion restriction. Then an inverse Mill Ratio is estimated as follows:

$$\hat{\Pi} = \frac{\eta(z_i \phi_i)}{\varpi(z_i \vartheta_i)} \quad (10)$$

where $\hat{\Pi}$ is used as a way of controlling endogeneity.

The second step involves the use of $\hat{\Pi}$ in estimating y :

$$y_i = \mathbf{X}_i\Omega + \gamma\hat{\Pi}_i + \nu_i \quad (11)$$

where $\gamma = \frac{\sigma_{\mu_1\mu_2}}{\sigma_{\mu_2}^2}$

4.2 | Source of data and sample size

Our empirical investigation requires obtaining data from the target population, hence data used for this study was sourced from the 2015/16 Nigerian GHS. The GHS has a sample of 22,200 individuals drawn from all the 36 states of the federation including the Federal Capital Territory, Abuja. The sample design for the GHS is the multi-stage stratified sampling design. The variables used are mostly categorical and nominal variables, for example, whether a respondent received remittance (success) or not (failure). Where continuous variables are used, they are converted to their log form (for example, size of household).

5 | RESULTS

Descriptive statistics of the GHS indicates that the mean remittance in cash received in the past 12 months following the survey was \$323.44. On the other hand, average remittance received as an in-kind gift within the past 12 months was \$962.68, with a maximum in-kind gift worth \$788,978.86.

On the other hand, Table 2 shows that the average number of hours of labour force participation was 41.10 hr per week. Farm activities receive about 43.9 hr of labour supply while non-farm activities receive about 38.3 hr of labour per week. Also, weekly labour hours range from 37.7 hr and 33 hr (for rural workers) to 45.2 hr and 43.1 hr (for urban hours) for farm and non-farm activities respectively. On average, male labour force participants offer about 39.1 labour hours (39.6 for farm and 38.6 for non-farm) while female labour force offers an average of about 27.2 labour hours (23.1 hr for farm activities and 31.2 hr for non-farm activities).

In addition, the receipt of remittance by households varies across demographic characteristics. On average about 5.6% of the households received remittance in the past 12 months. Table 2 also shows that the receipt of remittance was highest in the urban areas with about 8.7% of the households receiving remittance in the past 12 months.

TABLE 2 Descriptive statistics of receipt of remittance and labour hours

	Percentage of Nigerian household receiving remittance in 2016 (%)	Weekly labour hours (hours)	
		Farm activities	Non-farm activities
Male	6.7	39.6	38.6
Female	5.6	23.1	31.2
≤24 years	3.2	27.1	24.8
≥25 years	7.3	46.9	42.3
Secondary education and below	8.1	26.6	23.4
Post-secondary education	3.4	32.9	41.2
Urban	8.7	45.2	43.1
Rural	3.5	37.7	33.0
National average	5.6	43.9	38.3

Source: Authors' computation.

The result of the propensity score estimation is shown in both Table 3 and Figure 2. The conditional probability of receiving remittances was estimated using logistic regression and the model presented in Table 3 with a log-likelihood ratio of 89.016 (which is significant at 0.01 significance level) is adjudged to have a good fit. This implies that the covariates are capable of predicting the likelihood of receiving remittance. The logistic estimation result shows that being male increases the probability of receiving remittance by 10.5%. Similarly, the likelihood of receiving remittance increases for male-headed households by 1.8%. Also, the likelihood of receiving remittance increases for adults (persons of 25 years and above), persons of all levels of educational attainments, persons engaged in both categories of economic engagement (whether farm or non-farm activities) and households with smaller size. The mean probability score is 0.277 and this indicates that the probability that every Nigerian household receives remittance is 27.7%.

The common support graph in Figure 2 shows the visual presentation of overlap in propensity scores between remittance-receiving households and the control group. The overlap depicted in Figure 2 suggests that the match is good and balanced.

To ascertain the netted-out impact of remittance-receipt by households on labour force participation, the average effect of receiving remittance on the recipient households was estimated using the PSM which is adjudged useful for handling such potential non-randomness associated with receiving remittance. The PSM involves matching persons from remittance-recipient households with those from non-remittance-recipient households. It ensures that the matched households have similar observable attributes to the effect that any observed difference in labour force participation arises from receipt or non-receipt of remittance. This difference is averaged out to obtain the average treatment effect on the treated (ATT). Results of the ATT estimations using nearest-5-neighbourhood (NN5) matching techniques are presented in Table 4. We also estimated the Rosenbaum bounds (RB) to test the validity of the conditional independence assumption. In addition, Heckman two-step estimation was implemented to offer benchmark estimation.

TABLE 3 Logistic regression function for receiving remittance by the households

Covariates	Estimates	Standard error
Gender: Male, GEN_MAL (male=1, otherwise 0)	0.105***	0.035
Gender: Female, GEN_FEM (female=1, otherwise 0)	-0.024***	-0.008
Log of household size, LogHOS	-0.211*	-0.125
Head of household, HOH(male=1, female=0)	0.018***	0.004
Pre-adult ^a , AGE_24(24 years and below=1, otherwise 0)	-0.304**	0.127
Adult, AGE_25(25 years and above = 1, otherwise 0)	0.295*	0.166
Pre-tertiary education, EDU_SEC(secondary education and below = 1, otherwise 0)	0.033**	0.014
Post-secondary education, EDU_PSEC(post-secondary education = 1, otherwise 0)	0.069***	0.013
Spatial location: Rural, LOC_RUR (rural residents=1, otherwise 0)	0.089	0.079
Spatial location: Urban, LOC_URB (urban residents=1, otherwise 0)	-0.023	-0.017
Marital status, MARS (single = 1, otherwise 0)	0.049	0.053
Economic engagement, FARM (farm = 1, otherwise 0)	0.027***	0.004
Economic engagement, NONFARM (nonfarm = 1, otherwise 0)	0.292***	0.027
Obs	19183	
LR(χ^2)	89.016	
Prob(LR(χ^2))	0.001	
Pseudo R^2	0.281	
Propensity score (mean)	0.277	

Notes: *, ** and *** indicate significant at 10%, 5%, and 1% respectively.

^aAccording to the African Institute for Development Policy (2018), the United Nations classifies persons aged 0–14 years as children, 15–24 years as youths and 25 years and above as adults. Thus, we classify persons below 25 years as pre-adult.

Source: Authors' computation.

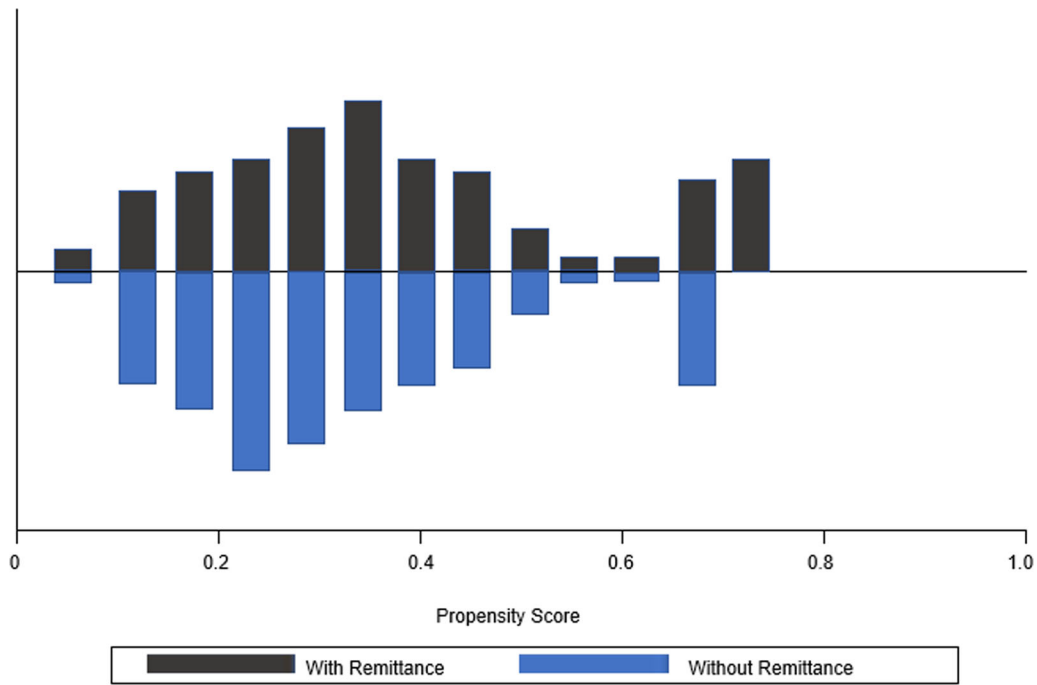


FIGURE 2 Common support graph. Source: Authors' estimation

TABLE 4 Summary of ATT from PSM and Heckman model

	PSM	First step Heckit	Second step Heckit
Spatial location: Rural	-0.239*** (0.027)	-0.050** (0.020)	-0.578*** (0.202)
Urban	0.081*** (0.017)	0.004** (0.002)	0.010*** (0.004)
Gender: Male	0.035* (0.018)	0.008 (0.005)	-0.009*** (0.004)
Female	-0.067*** (0.022)	-0.017*** (0.002)	-0.052*** (0.006)
Age:<24 years and below	0.038*** (0.011)	0.013*** (0.003)	0.002 (0.003)
25 years and above	-0.029* (0.015)	0.009*** (0.001)	-0.001** (0.001)
Economic engagement: Farm	-0.093*** (0.022)	-0.034*** (0.006)	-0.018*** (0.004)
Non-farm	0.059*** (0.016)	0.028*** (0.007)	0.021 (0.004)
Education: Secondary education and below	0.023*** (0.002)	0.053*** (0.003)	0.039*** (0.002)
Post-secondary education	-0.192 (0.152)	-0.031 (0.071)	-0.089 (0.291)
Household size		0.089 (0.901)	0.069 (0.290)
Marital status		0.067*** (0.012)	0.025** (0.011)
Rural × household size		0.007 (0.075)	0.018 (0.026)
Urban × household size		0.010*** (0.003)	0.022** (0.010)
Ψ (RB)	1.062		
$\hat{\Pi}$ (inverse mill ratio)			-1.116 (0.992)
Sigma			2.048
Rho			-0.545

Notes: *, ** and *** indicate significant at 10%, 5%, and 1% respectively. ATT, average effect of treatment on the treated; PSM, propensity score matching. Source: Authors' computation.

TABLE 5 Post-estimation evaluation

	Remittance recipient household	Non-remittance recipient household	Difference	Standard error
GEN_MAL: Unmatched	0.254	0.243	0.011***	0.0027
Matched	0.254	0.256	-0.002	0.0018
GEN_FEM: Unmatched	0.242	0.211	0.031**	0.0139
Matched	0.242	0.239	0.003	0.0165
HOS: Unmatched	0.756	0.689	0.067***	0.0159
Matched	0.756	0.758	-0.002	0.0015
HOH: Unmatched	0.786	0.749	0.037***	0.0118
Matched	0.786	0.792	-0.006	0.0061
AGE_24: Unmatched	0.374	0.395	-0.021***	0.0042
Matched	0.374	0.378	-0.004	0.0028
AGE_25: Unmatched	0.621	0.654	-0.033***	0.0113
Matched	0.621	0.618	0.003	0.0039
LOC_RUR: Unmatched	0.212	0.238	-0.026***	0.0089
Matched	0.212	0.216	-0.004	0.0178
LOC_URB: Unmatched	0.362	0.468	-0.106***	0.0132
Matched	0.362	0.358	0.004	0.0057
EDU_SEC: Unmatched	0.792	0.777	0.015**	0.0066
Matched	0.792	0.791	0.001	0.0009
EDU_PSEC: Unmatched	0.207	0.422	-0.215***	0.0714
Matched	0.207	0.205	0.002	0.0015
FARM: Unmatched	0.652	0.604	0.048***	0.0117
Matched	0.652	0.655	-0.003	0.0033
NONFARM: Unmatched	0.347	0.363	-0.016***	0.0031
Matched	0.437	0.436	0.001	0.0025
MARS: Unmatched	0.619	0.712	-0.093***	0.0366
Matched	0.619	0.625	-0.006	0.0068

Notes: *, ** and *** indicate significant at 10%, 5%, and 1% respectively.

Source: Authors' computation.

The ATT for rural household labour force participation is -0.239 while that of urban household labour force participation is 0.081 . All estimates for spatial locations (urban/rural) are significant at 1%. This means that receipt of foreign remittance may reduce the labour force participation of rural dwellers while increasing that of urban dwellers. This result may be attributed to rural-urban drift or the relative lower cost of living in rural areas. When rural households receive substantial remittances, the likelihood that some members of the household may migrate to the urban areas to start business ventures with the remittance received is increased. This view was earlier advanced by Gong, Kong, Li, and Meng (2008) and Akay, Giulietti, and Robalino (2012) who obtained evidence that receipt of remittance increases rural-urban drift in China. Gong et al. (2008) argue that remittance is a form of non-wage income which could augment for capital. In Gong et al.'s (2008) view, the capital that rural residents raised from remittances received could further fuel internal migration as they move to cities to start businesses. However, Akay et al. (2012) explained that remittance could have a snowball effect: as migrant remittances increases, more rural residents would migrate away in a bid to also exploit the opportunities that migration offers. The results also suggest that remittance-receiving females in the labour force are more likely to reduce their participation rate than their male counterpart.

Table 4 also shows that remittance-receiving persons with post-secondary education reduce their labour force participation unlike their counterparts with just secondary education or less. According to human capital theory, individuals with higher education may have higher reservation wage due to associated higher productivity. However, educated individuals are likely to reduce their reservation wage if there are no alternative sources of income (such as wealth, spousal income or other forms of family supports such as remittances). Thus, the receipt of remittances is likely to raise the reservation wage of the highly educated, especially when transfer income from remittances is higher than the prevailing wage level. The result also shows that receipt of remittances increases the participation of younger members of the labour force more than that of the older ones because the former are more likely to invest remittances into productive ventures rather than for sustenance. The results also predict that receipts of remittances from abroad increase labour force participation of non-farm occupations but decrease labour force participation on farm occupations. This finding corroborates the evidence obtained by Vadean, Randazzo, and Piracha (2017) which holds that remittance inflow boosts the growth of small-scale businesses. In credit-constrained economies, remittance inflow could serve as business capital for start-ups and business expansions. In other words, as more farmers receive remittance, they could diversify into agro-based engagements or diversify away into merchandise or small-scale manufacturing activities. Although there is a possibility of deepening investment into commercial and mechanized farming (Gonzalez-Velosa, 2011), there is a high tendency that increase in remittance inflow could fuel the expansion of non-farm activities. The estimate for post-secondary education appears to be insignificant. This suggests that while labour supply of persons with pre-tertiary educational qualifications is expected to increase, the effect of remittance on the labour supply of persons with post-secondary education is insignificant.

The RB (Ψ) parameter for labour participation is 1.062. This implies that an unobserved covariate could raise the odds of selection into labour participation by 6.2% so as to cause the estimated ATT to be statistically insignificant at the 5% significance level. Also, given that the Ψ is approximately 1, one can conclude that the PSM estimated ATT is not sensitive to a confounding covariate. Put differently, it suggests that the CIA holds for the PSM estimation. This is further corroborated by the estimates obtained from the Heckman two-step procedure, which are not significantly different from the PSM results.

To ascertain the success of the matching of treatment and control groups based on the covariates, a test of difference of mean was conducted on the hypothesis that the mean value of each variable is the same in the treatment group and the control group. The test was done before and after matching. Our results shown in Table 5 indicate that before matching, there are significant differences in the covariates of the treatment and control groups. However, PSM reduces bias by matching treatment groups with control groups that have similar characteristics. Thus, the evidence provided in Table 5 grants additional assurances that, through the PSM, it was possible to generate a control group which is similar enough to the treatment group that was used for the ATT estimation.

6 | CONCLUSION AND POLICY RECOMMENDATIONS

In developing countries, migrant remittances are major sources of incomes to households. The worry among researchers is whether foreign remittances have non-trivial implications for the domestic economy, either at the micro or macro level. This study contributes to the discussions on the implications of remittances for the Nigerian economy from the standpoint of the labour force participation rate. Utilizing the 2015/2016 Nigerian GHS, the results of propensity score matching and the Heckman two-step benchmark model reveal that receipts of remittances increase labour force participation for non-farm economic activities. Remittance inflows are also found to increase labour force participation in urban areas. The results also suggest that although remittance inflow could increase the labour supply of persons with pre-tertiary education, its impact on persons with post-secondary education remains insignificant. We also found that remittance inflows raise economic activeness of the younger members of the labour force who constitute a greater percentage of the Nigerian population.

Given the positive impact of remittances on Nigeria's active population and its non-farm engagements (which extends to Nigeria's industrialization path), we recommend that effort should be made to strengthen the banking system in order to facilitate the transfer of remittance to households using new technologies. In addition, the Central Bank of Nigeria can redesign its financial institution regulatory framework such that non-bank credit unions and microfinance institutions could play a critical role in money transfers. This will ensure that hassles involved in remittance transfer in rural areas are mitigated. Also, the use of remittance flow stream as collateral could be encouraged as a veritable corridor for investment financing. This is very much plausible since remittance being a relatively

stable source of income could mimic employment income. In other words, loan product can be designed to encourage acceptance of remittance as collateral security for loans targeted at financing productive investments. Finally, an enabling and industrialization-friendly climate should also be created to enhance the utilization of remittance inflows for new industry-based business start-ups. The decline in labour participation in the rural and concomitant increase in labour supply in urban areas suggests that there is a need for even development of both the rural and urban centres. This will help to reduce rural-urban drift as recipients of remittance can invest the income so received on viable businesses in the rural areas.

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How to cite this article: Nwokoye ES, Igbunugo CI, Dimnwobi SK. International migrant remittances and labour force participation in Nigeria. *Afr Dev Rev*. 2020;32:125–137. <https://doi.org/10.1111/1467-8268.12421>