

MIGRANTS' REMITTANCE FLOWS AND USE IN NIGERIA

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ABSTRACT

Nigeria is the highest remittance receiving county in the sub-Saharan Africa, posting over US\$22 billion in 2017. The huge sum is used based on the discretions of the receiver and or the instructions of the senders. In any case, the macroeconomic implications of the use could be substantial. Conspicuous use of remittances is usually accompanied with macroeconomic instability. Even when it is productively used, it may distort policy targets of the authorities. Thus, this paper seeks to investigate how the major components of spending, that is, private consumption, investment and imports respond to changes in remittances. Employing Generalized Method of Moments (GMM) situated in the macroeconomic model that articulated the various uses of remittances, we find, between 1980 and 2017 that all these components responded positively and significantly to remittances. Meanwhile, out of these three, imports responded faster while investment had the least response. We could not establish whether spending on imports is productive or otherwise since it is composed of both final and intermediate goods. However, received evidence indicates that remittances are spent mostly on the purchase of import final goods. Thus, the use of remittances need to be tuned towards investment so as not to create economic instability, particularly inflation.

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INTRODUCTION

The rate, size and uses of personal remittances in developing countries is gaining continuous interest among development, international finance and macroeconomic researchers. Development economists are interested in how and to what extent has the inflow improved the welfare of the people. International finance economists are worried about its disequilibrating effects on balance of payments. Macroeconomists are concerned about how the inflow could distort fiscal and monetary policies. The official volume of global remittances has increased systematically from less than a billion dollars in the 1980s to US\$101.3 billion in 2005. It rose to US\$317.9 billion in 2006 and by 2010 (4 years later), it has increased to US\$440.1 billion. In 2014, it posted US\$597.7 billion, representing an average growth of approximately 6 percent between 2010 and 2014. But in 2017, world remittances dipped to US\$595.7 billion.

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The general observation is that despite slight slowdown in the Global remittance inflow, it has been growing faster than world GDP growth. Nigeria is one of the highest remittance receiving countries in the world and as a result was ranked the 10th remittance recipient in the world and 6th in developing countries in 2010. Since 2015, the country has moved to the 6th position in the World and 5th among the developing countries. Nigeria accounted for US\$20.8 billion out of US\$34.8 billion of remittance inflow to sub-Saharan Africa in 2015, up from US\$19.7 billion out US\$29.9 billion to SSA in 2010. Remittances was projected to increase to US\$37.8 billion in SSA in 2017 of which US\$22.3 billion was projected for Nigeria. This implies that Nigeria has been accounting for more than 55 percent of total SSA remittance inflows (see World Bank, 2017). Meanwhile these figures preclude unofficial remittances which were assumed to be almost half of the official figure (Lucas, 2004). In the case of Nigeria, the increase in unofficial remittances is triggered by the current managed exchange rate regime that appears not to favour the senders (World Bank, 2017).

Be that as it may, remittances¹ in Nigeria are the second largest inflow of foreign exchange after oil revenue and its share in GDP is trending upwards, increasing from 3 percent of GDP in the early 2000s to 5.6 percent in 2017. Given the behavior and dynamics of remittances over time in Nigeria, it should be an important source of 'income' and by implication, source of spending². Since remittances are private inflow, receivers are free to spend it as they like. The implication of this is that the spending pattern may likely distort macroeconomic stability, particularly if it is nonproductive. For instance if remittances were spent on imported final goods, it could fuel inflation and currency depreciation. Furthermore, indiscriminate use of remittances could fuel moral hazard thereby heating hard on the demand side particularly if there is no response from the supply side. However, remittances can be spent on wealth creation such as sponsoring basic education, small business startup, healthcare and the purchase of housing/land properties. The use of remittances this way is productive. Generally, the pattern of consumption and investment for which remittances are used will provide information on whether it will enhance productivity and cause macroeconomic stability or not.

The foregoing points to some specific research questions such as if remittances were used for private consumption, investment and imports, how did each of these respond to remittance inflow? Which of these sources most responsive to changes in remittances and why? What information about the use of remittances could be provided for policy makers in a way as to make remittances more effective to economic improvement? There is a plethora of research works on remittances in Nigeria. Some researchers concentrated on the nexus between remittances and development with special reference to poverty and economic growth (see Babatunde and Martinetti, 2010; Ogwumike and Olubiyi, 2009). Some papers only describe the pattern and structure of remittances and use the information to characterize remittance behavior (Adepoju, 2007; Adepoju & Weil, 2010; and Orozo, 2007). Very recent readily available evidence on the growth effect of remittances include Adarkwa (2015), Odionye and Emerole (2015) and Edoun, Ezeanyika and Mbohwa (2015). Our study departs from works in at least two ways. First, most of the studies used field survey which only captures a minute proportion of the remittance receivers in the country. Papers that employed secondary data based their results on trend analyses (averages and percentages) without any quantitative evidence that will direct the policy makers appropriately³. Papers with econometric estimation considers growth effect of remittances without reference to the contribution of each spending component. Besides, the growth effects of remittances are diverse, and this calls for further investigation of remittances effects on each of the expenditure components

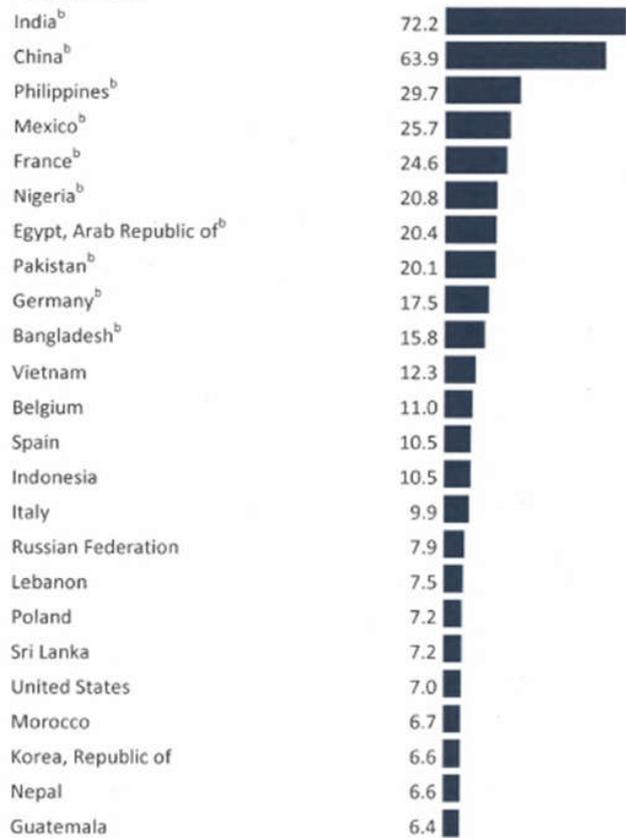
Background information about remittances and its use in Nigeria

Remittance Behaviours in Nigeria: In the recent time, Nigeria has registered its name on the top remittance receiving

countries in the world. As Figure 2.1 shows, Nigeria took the 6th position among the top remittance receiving countries in the world in 2015 by posting US\$20.8 billion⁴. This amount was more than two-third of the government total final consumption spending in the same year. The Figure shows that Nigeria was the only sub-Saharan Africa that appeared on the chart. Table 2.1 presents the behavior of remittances over three decades in Africa. As the Table shows, the highest remittances receiving country in SSA was Lesotho in the first decade, taking 24.4% of total remittances to the region.

Top Remittance-Receiving Countries, 2015f

US\$ billions



Source: Extracted from Migration and Remittances Factbook (2016), 3rd Edition, the World Bank: letter b represent top 10 remittances receiving countries.

Figure 2.1. Top Remittance Receiving Countries (2015)

In that period, Nigeria was in the 15th position and accounted for less than 1% of total remittances in SSA.⁵ According to the World Bank (2016), top destination countries of Nigeria emigrants were the United States, the United Kingdom, Chad, Cameroon, Italy, Benin, Côte d'Ivoire, Spain, Sudan, Niger. Although only four of these are advanced countries, over 70% of remittances come from these countries and United States alone account for over 60%. In the second decade, 1990-2000, Nigeria had the highest amount of remittances in SSA and accounted for around 28.4% of total. During the 2010-2016 period, the share of Nigeria in SSA remittances was approximately 66%.

¹ Personal remittances is the addition of personal transfer and compensation of employees. This measure is broader than the old workers' remittances (see World Bank, 2015 for a comprehensive conceptual definition of personal remittances)

² The recent action of the CBN also point to the fact that remittances are becoming important source of finance as the Bank introduced Diaspora Bond in 2016 and the bonds were over subscribed.

³ A comprehensive anecdotal analysis of the use of remittances in Nigeria is documented Adepoju and Weil 2010.

⁴ The amount reported by the CBN for the same year was US\$19.8 billion (almost double). This implies that truly, about 50% of remittances did not go through the official channel and the CBN was able to track this.

⁵ The reason for Nigeria taking this position was not unconnected with the porous methods of reporting remittances in the country that time. Also, Nigerians were not many in advanced countries due to high restrictive migration policy against the country, particularly the unskilled ones.

This systematic increase was not unconnected with series of expansionary migration policy of the advanced countries, particularly the US, Canada, Sweden and the UK. Another factor is the stock of highly skilled Nigeria emigrants abroad. The World Bank (2011) reported that in 2000/2001, Nigerian expatriates in the OECD constituted 55.1% of total emigrants (OECD, 2005). These highly skilled emigrants tend to get better paid jobs relative to the low skill counterparts. Since 1991, Nigeria has been the top remittance receiving SSA country with its share surpassing two-third of total remittance to the region.

Table 2.1. Share of each country in total SSA personal remittances

Countries	1980-1990	1990-2000	2000-2010	2010-2016
Lesotho	24.42%	12.88%	3.34%	1.75%
Sudan	17.28%	10.24%	6.39%	1.79%
Burkina Faso	10.78%	1.95%	0.44%	0.39%
Senegal	6.80%	5.37%	5.10%	5.09%
South Africa	5.20%	5.89%	3.70%	3.40%
Swaziland	4.87%	2.83%	0.46%	0.12%
Mali	4.72%	3.33%	1.49%	2.50%
Benin	4.59%	3.22%	0.78%	0.60%
Mozambique	4.58%	1.82%	0.48%	0.61%
Botswana	4.25%	2.02%	0.34%	0.09%
Cabo Verde	2.53%	2.66%	0.72%	0.54%
Cote d'Ivoire	2.51%	3.28%	1.14%	1.20%
Cameroon	1.61%	0.70%	0.61%	0.67%
Niger	0.85%	0.44%	0.38%	0.49%
Nigeria	0.82%	28.39%	63.01%	65.81%
Ethiopia	0.78%	0.72%	1.09%	1.76%
Zimbabwe	0.73%	0.14%	0.00%	0.00%
Kenya	0.66%	5.93%	2.31%	3.62%
Mauritania	0.35%	0.29%	0.00%	0.00%
Comoros	0.34%	0.24%	0.26%	0.35%

Source: computed: underlying data from IMF Balance of Payments database, 2017

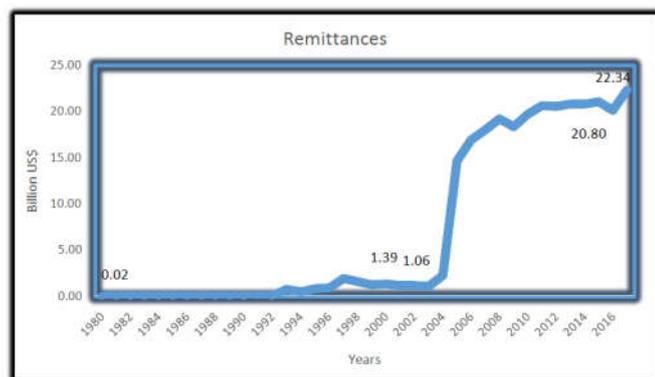


Figure 2.2. Trend of Personal Remittances

Meanwhile, remittance inflow was meagre in the 1980s, posting less than one billion dollars in 1980 but rose steadily to around US\$1.4 billion in 2000 but declined slightly to US\$1.06 billion in 2004 (Figure 2.2). In 10 years later (2014), it climbed to US\$20.8 billion while in 2017, the country was projected to realize more than US\$22 billion. The 2017 projection was informed not only by the historical increase over time but also by changes in some macroeconomic indices. Specifically, the country has been experiencing increase in oil output and also benefits from increase in world oil price that has risen from less than US\$35 in 2016 to more than US\$65 in the recent time. These supply and price shocks tend to raise the confidence in investment-oriented remittances. Besides, the current Central Bank policy of exchange rate stability

policy is also a good reason for increased remittances to the country.

Remittances Private Consumption, Investment and Imports

There are several ways by which remittances are spent but it can be categorized into three, namely private consumption, private investment and imports. Figure 2.3 relates the growth rate of remittances to the growth rate of private consumption. The trend line reveals a positive relationship between the two variables, implying that part of remittances were actually used for private consumption.

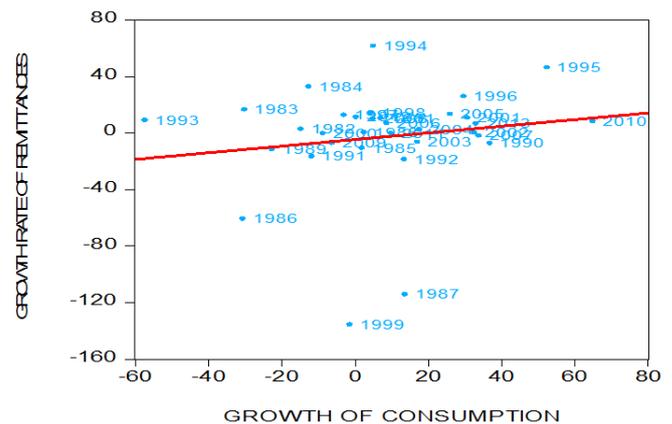
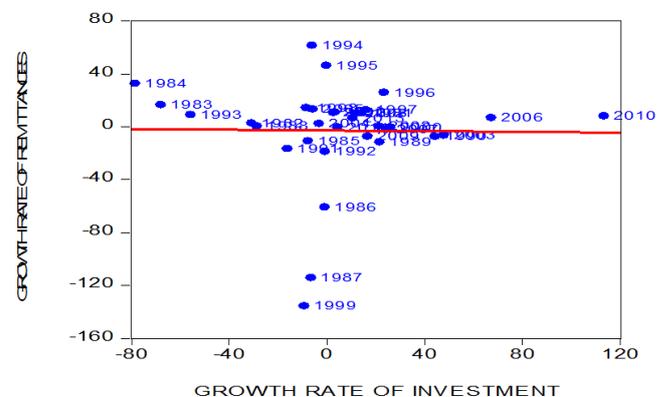


Figure 2.3. Remittances and private consumption

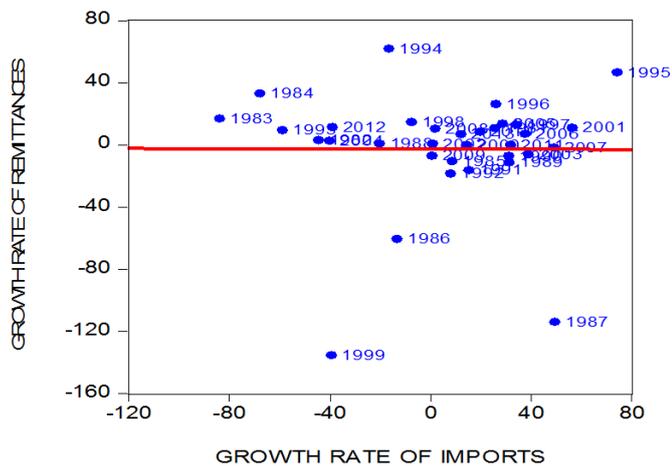


Source: computed: underlying data from IMF Balance of Payments database, 2017

Figure 2.4. Remittances and private investment

While the positive relationship between consumption and remittances is clear, there appear to be slightly positive relationship between private investment and remittances. To the extent that a major proportion of remittances are altruistic, private investment may not change significantly following increase in remittances. Also, another reason why private investment may not benefit so much from remittances is that the pattern of investment, in form of small businesses, where remittance recipients invest the money are mainly in the informal sector where data are elusive. The same relationship exists for remittances and imports if Figure 2.5. This statement is further buttressed by analysis of the purpose for which remittance senders and receivers save part of the money. As Figure 2.6 shows, migrants remit money back home mainly for their children/sibling/relative education. The second major purpose was for burial ceremony, followed by improvement in

the welfare of those left behind. Other purposes include birthday and wedding, funeral ceremony and religious anniversary. In the case of remittance receivers, business start-up, home improvement, and education topped the list of the purpose. Other reasons include purchase of home appliances, birthday and wedding, outings, parties etc., which can be classified as consumption of final goods and services. Meanwhile, the pattern of consumption as presented by the Figure suggests that most of these products are imported. The Figure also indicates that investment is not at the heart of the senders and receivers.



Source: computed; underlying data from IMF Balance of Payments database, 2017 and CBN Statistical Bulletin, Special Edition (2017)

Figure 2.5. Remittances and imports

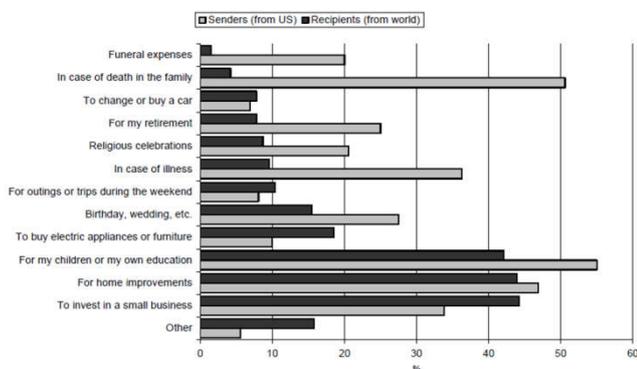


Figure 2.6. Uses of remittances in Nigeria

Literature Review

Empirical evidence on the direction of effect on each of the components identified is diverse. The Inter-American Development Bank's Multilateral Investment Fund (2004) reveals that consumption accounted for between 60 and 80 percent of the remittance use in a sample of five Latin American countries, and the World Bank (2006) also identified this pattern for a larger sample in the same region. Some studies, however, find a smaller propensity to consume out of remittances than out of other income. Adams (2005) obtains this result in a study on households in Guatemala. In another development, Ogwumike and Olubiya (2009) shows that significant portion of remitted funds are spent on consumption in sub-Saharan Africa. Osili (2007) carried out a field survey on Nigeria remittance receivers and argue that impact of remittances on household welfare depends on their use. Orozco (2007) shows that consumption of final goods accounted for approximately 50% of some remittance senders.

while remittance receivers use about 60% on consumption and 35% on investment. Combes and Ebeke (2011) examined the use of remittances in developing countries and reveals that it is used to smoothen consumption. Babatunde and Martinetti (2010) examined the impact of remittances on food securities and nutrition in rural Nigeria. They carried out a survey on farm household in Kwara state and employed 3-stage random sampling technique to choose 220 households. They found that remittance receivers are better-off than non-receivers. In particular increase in remittances leads to improved calorie supply but does not affect dietary, that is, remittances are not spent on quality food. In Ghana, Quartey, (2006) found evidence of increased food consumption among remittance receiving households. Ratha (2003) submits that remittances are spent on acquiring locally produced goods and so, it has strong consumption multiplier effect.

Several researchers emphasize that remittances are spent on investment, particularly on property holdings such as land and housing. Sofranko and Idris (1999) showed in the case of Pakistan that a small proportion of remittances from the Middle East was channeled into business investment. Woodruff and Zenteno (2007) investigated the correlation between migration and small business investment in Mexico. They employed state-level data and found a positive correlation between the amount of remittances and business investment in a state. Yang (2004) examined how migrant families use remittances in Phillipine. He carried out a survey on 1600 remittance receivers in the country and found that only 5.4% of total remittances was spent on education while over 60% was spent on consumption of durable goods. He also demonstrated that increase in remittances lead to increase in the consumption of durable goods. Edward and Ureta (2003) remittances are used to increase school retention rate in Philippines. However, Davies & Brazil (2016) found a counter outcome in Guatemala when the national-level household survey data collected in 2000 show that remittances could not compensate for the absence of the emigrating families because migrant fathers with young children are not able to achieve economic success soon enough to compensate for their absence.

Adams (2005) conducted survey for Guatemala and found that beneficiaries spent less on consumption than those who did not receive the transfer. However, part of the money also goes to investment. In Ghana, Quartey (2006) used the GLSS survey to examine the effect of remittances on welfare and found that increase in remittances leads to improvement in welfare of both the receiver and the non-receiver. Kure and Nwosu (2009) examined the channel through which remittances spur growth in Nigeria. Their findings show that the transmission mechanism through which remittances affect growth is investment, but also exerts a pass-through effect on consumption. Medina and Cardova (2010) examined the case of Colombia with a result showing that receivers spent about 10% more of total expenditure on education. The authors did not notice any effect of remittances on consumption, investment in physical capital and health.

The brief review of empirical evidence suggests that remittances are used in several ways but the effectiveness of the use is unclear. In some countries, consumption accounted for a large chunk of the fund while in some countries investment in human capital takes the lion share. However, there is little evidence on the structure of the effectiveness of

the fund and the macroeconomic implication therein. In particular, although evidence abound that remittances complement consumption spending, aid school enrollment and provide relief during economic downturn, the evidence failed to dig deeper into the structure of the spending pattern. The implication of this gap is that it confides very important information about the macroeconomic effect of remittances. This is the gap the present study seeks to fill.

Theoretical framework: In order to identify possible policy options for increasing the benefits of remittances, it is useful to consider the links between remittance usage at present, and in the future. Figure 2.7 shows that remittances are used for both present and future consumption. This model follows the work of Ellerman (2003) where a remittance-dependent community or state tend to use part of current remittances for present consumption, and use the remaining for investment.

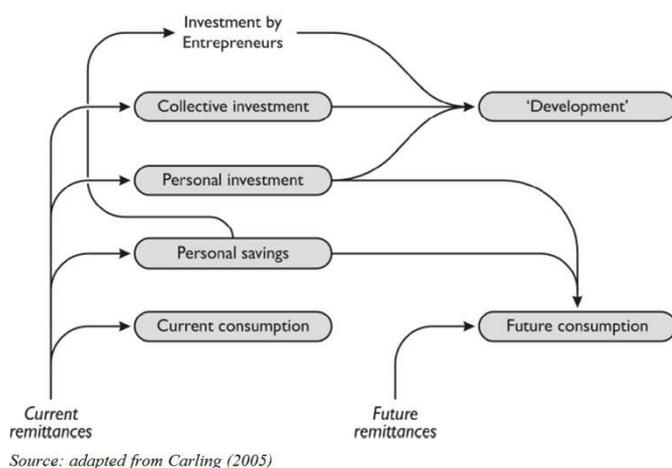


Figure 2.7. A model describing the uses of remittances

If remittances today are only spent on consumption, future consumption has to be financed by future remittances (or other sources of income). If remittances are invested or saved, this could help finance future consumption. When remittances are saved in financial institutions, this increases credit availability and can enable entrepreneurs to realize investments that have a positive impact on development. This could be a more realistic way of stimulating investment of remittances than promotion of entrepreneurship by migrants or remittance receivers themselves. Still, there is always a chance that investors will channel funds into uses with high yields, which might be different from uses with high development impacts.

MATERIALS AND METHODOLOGY

Model Specification

The theoretical framework discussed above shows that remittances are used basically for consumption and investment. Meanwhile, received evidence shows that the consumption basket is composed of domestic and import product. Thus, it will be reasonable to choose a model that will appropriately show how effective is the use of remittances on consumption of domestic products, imported goods and domestic investment. The model adopted is a modification of Glytsos (2002a, 2002b and 2002c). It is a linear demand oriented equation to determine how effective is the use of workers’ remittances on private consumption (C), investment (I), and imports (M). There are three behavioral equations, the

consumption function, investment function and the import function.

$$C = F(E, R, X) = a + b(E - T) + cR + X \tag{1}$$

$$I = F(Y, R, X) = I_0Y + I_1Y - I_2i + I_3R + X \tag{2}$$

$$M = F(Y, R, H, X) = M_0 + M_1Y + M_2H + M_3R + X \tag{3}$$

Where E, R, and Y represent personal income (compensation of employees), workers’ remittances and gross domestic product respectively. T, i, and H correspondingly represent taxes, interest rate, and exchange rate. Letter X represents other control variables that are found in the literature to affect each of the models. The econometric specification of the above equations are given in equations 4 to 6 as follows:

$$CONS_t = \alpha_0 + \alpha_1INCOME_t + \alpha_2REM_t + \alpha_3TAX + \alpha'X + \varepsilon_t \tag{4}$$

$$INV_t = \beta_0 + \beta_1GDP_t + \beta_2REM_t + \beta_3INT_t + \beta'X + \varepsilon_t \tag{5}$$

$$IMP_t = \lambda_0 + \lambda_1INCOME_t + \lambda_2REM_t + \lambda_3EXCH_t + \lambda'X + \varepsilon_t \tag{6}$$

Where CONS, INV AND IMP are private consumption, private investment and import demand respectively. REM, INT and EXCH stand for workers’ remittances, prime interest rate, and exchange rate respectively. All the parameters stand for estimators in each equation.

Estimation Technique

There is no doubt that equations 4 to 6 are fraught with estimation problem. One of such problems is the dependence of the error distribution on the regressors’ distribution, that is, there is the possibility of heteroscedasticity. This problem can be partially addressed through the use of heteroskedasticity consistent or “robust” standard errors and statistics. The usual approach today when facing heteroskedasticity of unknown form is to use the Generalized Method of Moments (GMM) (Hansen, 1982). Efficient GMM brings with it the advantage of consistency in the presence of arbitrary heteroskedasticity., but at a cost of possibly poor finite sample performance. If heteroskedasticity is in fact not present, then standard instrumental variable (IV) may be preferable. Even when IV or GMM is judged to be the appropriate estimation technique, the necessary condition for validity is that the number of the IV must be greater than or equal to the number of the explanatory variables. Thus, J-statistics act as a test for model misspecification. A large J-statistic indicates a mis-specified model. Thus the GMM version of equations 4-6 after log-linearizing them are specified as follow:

$$\Delta \ln CONS_t = \alpha_1 \Delta \ln CONS_{t-1} + \alpha_2 \Delta \ln INCOME_t + \alpha_3 \Delta \ln REM_t + \alpha_4 \Delta \ln TAX + \alpha' \Delta X + \Delta \varepsilon_t \tag{7}$$

$$\Delta \ln INV_t = \beta_1 \Delta \ln INVE_{t-1} + \beta_2 \Delta \ln GDP_t + \beta_3 \Delta \ln REM_t + \beta_4 \Delta \ln INT_t + \beta' \Delta X + \Delta \varepsilon_t \tag{8}$$

$$\Delta \ln IMP_t = \lambda_1 \Delta \ln IMP_{t-1} + \lambda_2 \Delta \ln INCOME_t + \lambda_3 \Delta \ln REM_t + \lambda_4 \Delta \ln EXCH_t + \lambda' \Delta X + \Delta \varepsilon_t \tag{9}$$

the assumption underlying the specification of equations 7 to 9 is that the error terms should not be serially correlated, that is,

$$E[\varepsilon_{i,t}, \varepsilon_{i,t-1}] = 0 \forall s \geq t$$

With the initial condition being predetermined by at least one period Meanwhile, both static (equation 4-6) and dynamic (equation 7-9) models will be estimated but only the dynamic model result will be discussed extensively.

Data Issues Sources and a priori expectation: Personal remittances are part of migrants' income that is sent back home for the purpose discussed in section 2. Data on the variable was extracted from the IMF Balance of Payments Yearbook (CD-ROM 2017). Other variables were extracted from the Central Bank of Nigeria Statistical Bulletin (online version). The effective use of remittances will be revealed by the model specified above. For example, if remittances are effectively used for consumption, it should positively and significantly affect private consumption. If it is insignificant, then private consumption does not respond to remittance changes. In this situation, remittances are used to purchase non- or underproductive goods. Similar argument can be made in the case of private investment. In the case of imports, effective use of remittances for the purpose of imports implies that remittance receivers use it for the purchase of imported final products. In any case, remittances are expected to positively affect import demand.

The control variables in the consumption equation include credit to the private sector, inflation rate, interest rate and dependency ratio. It is expected that if personal income, and credit to the private sector increase, private consumption should increase, thus we expect positive effect of these variables on consumption. The effect of inflation on consumption is unclear. On the one hand, if inflation increases, purchasing power must fall, and this will necessitate decrease in consumption. However, if consumption is assumed to be unaffected by rising inflation, it means there will be no real effect on consumption as inflation rises. Also, the effect of interest rate on private consumption is not clear. In the Keynesian world, increase in interest rate tend to raise opportunity cost of holding money, and so to reduce such cost, household we want to increase saving. In this case there is a negative effect of interest rate on consumption. However, if households have high stock of wealth, since the reason for saving is to increase future consumption, the high level of current wealth may require very high level of interest rate before the decision to save can be attractive. Based on this argument, interest rate can impact negatively or positively on consumption. In the case of investment, credit to the private sector and inflation are other controlled variables. All variables on the right hand side of the equation except interest rate are expected to positively affect private investment. However, the direction of effect of inflation is not clear. It could be positive or negative depending on the state of the economy. Moreover, interest rate may not affect investment particularly if sales drives investment more than changes in interest rate. Exchange rate is an important control variable in the import equation and it is expected that exchange rate defined as the quantity of naira exchanged for a unit of dollar have a negative effect on imports. All data were collected spanning 1980 to 2017 (27 years).

ESTIMATION RESULT

The statistical characteristics of the variables are presented in Table 5.1. Credit to the private sector grew at an annual average of 2.2% between 1980 and 2014 with the maximum growth being around 26% and the minimum growth rate was 6%. Exchange rate grew at an annual average of around 4.8% with the maximum growth being 6.3% and minimum growth being 3.9%. The highest rate of growth of exchange rate was experienced in the 2000s when the country adopted managed floating exchange rate. Private consumption grew at

an average of 3.7% while remittances grew at an average of approximately 2%. The average growth rate of GDP was 4.1% while that of private income was 2.0%. Inflation rate recorded an average of 19.7% while lending rate averaged 12.7%. Table 5.2 presents the pairwise correlation matrix of the variables. The result shows that there is a strong and positive relationship between GDP and private consumption, implying that increase in one will lead to increase in the other. This result is consistent with the theoretical underpinning of the relationship between GDP and consumption. Also, the relationship between investment and interest rate is negative and significant, even though it is weak. This may suggest that firms use other means to raise investment. Other relevant relationships in the Table is the one between import and investment, import and private consumption, government spending and private consumption, remittances and personal income. In each of these cases, there exists a relatively strong positive relationship. In the case of import and investment, the positive relationship can be explained by the intermediate and capital goods that firms imported from abroad for the purpose of domestic production. In the case of private consumption and import, the Table shows that increase in private consumption reflects increase in import. The same scenario exists in the case of government spending and private consumption. The relationship between remittances and imports was positive and relatively strong. Although, the same relationship was established in the case of investment and consumption, that of remittances-imports was stronger and significant unlike it appears in the case of private consumption and investment. This could be an impression that remittances receivers spend high proportion of this money on imported goods. However, this result failed to show the exact causal relationship, that is, whether it is increase in remittances that leads to increase in imports or vice versa. Not only that, the result failed to establish the exact magnitude of effect on each of the variables of interest.

Effects of remittances on consumption, investment and imports: Tables 5.3 and 5.4 present two different scenarios. Table 5.3 presents result percentage responsiveness of consumption, investment and import to percentage change in any of the explanatory variables. Table 5.4 serves as a robustness check in which the percentage responsiveness was replaced with the change in the share of consumption, investment and import in GDP following a change in the share of each of the explanatory variables in GDP. The OLS results arising from equations 4 to 6 is in the appendix. Most of the statistical properties of the results (OLS) show that there is presence of endogeneity problems which justifies the choice of Generalized Method of Moments. In each of the models presented in Table 5.3, more than 60% of variations in each of the dependent variables, that is, consumption, investment and imports, can be explained by their respective regressors. The value of the J-statistics for each model shows that the instruments, (the lagged independent variables), were valid and they are not over identified. The second column shows how private consumption responded to changes in each of the determinants. Remittances significantly and positively affected private consumption. Specifically, consumption rose by 0.7% for a 10% increase in remittances, suggesting that private consumption responded sluggishly to remittances in Nigeria. This could be an indication that a high proportion of remittances are received by the middle income class whose propensity to consume domestically produced goods would have been reduced.

To the extent that the propensity to consume out of remittances is small, it is not unexpected to find sluggish response of consumption to changes in remittances.

other various investment purposes such as human capital development. Interestingly, investment responded more to remittances than consumption.

Table 5.1. Descriptive Statistics of the variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Lending rate	37	12.741	4.248	6.000	26.000
Gdp	37	4.130	1.044	2.759	6.257
Investment	37	1.981	1.174	0.704	4.341
Private consumption	37	3.731	1.051	2.407	5.931
Imports	37	2.504	1.120	0.768	4.482
Govt. Spending	37	1.731	1.085	0.033	3.742
Credit to the private sector	37	2.171	1.166	0.665	4.252
Real effective exchange rate	37	4.825	0.667	3.907	6.303
Dependency ratio	37	4.484	0.023	4.454	4.521
Remittances	37	2.083	0.667	3.001	0.605
Disposable income	37	2.039	1.291	0.385	4.109
Corporate income	37	4.181	0.697	3.080	5.258
Inflation rate	37	19.742	17.920	5.382	72.836

Table 5.2. Pairwise Correlation Matrix of the variables

	Lncredit	Independ	lnexh	lnimp	lncons	Lninv	lngdp	lnincome	lnrem	interest	inflation	lngovt
lncredit	1.00											
Independ	0.09	1.00										
lnexh	0.15	0.02	1.00									
lnimp	-0.17	-0.35	-0.13	1.00								
lncons	0.15	-0.20	0.01	0.59*	1.00							
Lninv	0.00	-0.49*	-0.24	0.69*	0.34	1.00						
lngdp	0.31	-0.29	0.27	0.53*	0.72*	0.48*	1.00					
lnincome	0.17	-0.24	0.05	-0.04	0.08	0.24	0.24	1.00				
lnrem	0.09	0.29	0.31	0.51*	0.22	0.21	0.64	0.51	1.00			
interest	0.16	-0.71*	0.18	0.38*	0.30	-0.54*	0.38*	0.26	0.33	1.00		
inflation	0.26	-0.17	-0.10	0.26	0.39*	-0.20	0.42*	0.14	0.21	0.31	1.00	
lngovt	0.11	-0.31	-0.39*	0.47*	0.59*	0.13	0.35*	0.53*	-0.25*	0.30	0.59*	1.00

Note: * denotes significant at 5% level

Table 5.3. Dynamic Structural Model Result

	CONSUMPTION	INVESTMENT	IMPORTS
CONSUMPTION(-1)	0.660*** (3.28)		
INVESTMENT(-1)		0.110*** (5.10)	
IMPORTS(-1)			0.183*** (4.11)
REMITTANCES	0.0790*** (4.44)	0.334* (2.29)	0.347*** (6.98)
CREDIT_TO_PRIVATE	0.107*** (5.74)	0.340* (2.42)	0.188 (1.72)
DEPENDENCY_RATIO	-1.398*** (-6.22)		
LENDING_RATE	-0.0123*** (-4.97)	-0.0551* (-1.99)	-0.00589 (-0.90)
INFLATION	-0.0000888 (-0.29)	0.00444 (1.23)	-0.00221 (-1.34)
GOVT_SPENDING	0.0139 (0.45)		
DISPO_INCOME	0.847*** (7.88)		
LNGDP		1.774*** (4.88)	0.748*** (5.03)
CORPORATE_INCOME		0.682*** (6.03)	
CONSTANT	6.333*** (6.22)	-0.461 (-1.16)	-1.611*** (-4.03)
Observations	36	36	36
r2	0.991	0.936	0.893
r2_a	0.989	0.922	0.874
Hansen P-value	0.515	0.193	0.854

t statistics in parentheses

*p < 0.05, **p < 0.01, ***p < 0.001

The model for private investment reveals that remittances are also used for either self- insurance (purchase of properties) or

For 10% increase in remittances, private investment increased by 3.3%. This suggests that over time, the purpose for which

remittances is used shifts from altruism to investment in physical and human capital. Hence, either the remitters or the recipients emphasize investment as a major purpose for sending/receiving remittances. Imports' response to remittances is sizable, with its coefficient greater than that of consumption or investment. Specifically, imports increased by 3.5% when remittances rose by 10%. Meanwhile, it is important to be convinced that import response to remittances are productive or otherwise. This becomes more important in the case of Nigeria where industries rely mostly on import intermediate goods. Insofar as remittances are used to purchase these goods, the high response of imports to remittances cannot be considered as evidence of conspicuous or nonproductive spending. However, information on the use of remittances presented in section 2 shows that a good proportion of remittances were used to purchase home appliances, birthday, burial ceremony and religions. Most of the goods bought for these purposes are final goods imported from the advanced countries where more than 90% of remittances come from. Thus it is not surprising that remittances respond faster to imports than to domestic consumption or private investment. The implication of this is that large spending on imports from remittances will create adverse effect for balance of payments, mount pressure on domestic price level of imported goods, reduce the purchasing power of the non-remittance receivers. Consequently, it will increase the rate of foreign dependency. That is there is an exchange of foreign currency (remittances) for foreign goods with emigrants' effort acting as the medium of exchange.

All these variables are rightly signed. Increase in dependency ratio or lending rate reduces consumption. Meanwhile, consumption was mostly sensitive to dependency ratio but lending rate exerted mild effect. The sensitivity of consumption to dependency ratio is an evidence of high fertility rate subsisting in the country. The marginal propensity to consume is also on the high side, with a 0.8% increase in consumption for every 1% increase in disposable income. This is an indication that most Nigerians are still poor, trying to meet up with basic needs instead of saving, as income increases. In the case of investment, credit to the private sector, lending rate, economic size and corporate profit are drivers. Improvement in the economic size has helped private investment to grow. Also, firms raised investment by 6% for every 10% increase in profit. Investment responds sluggishly to changes in lending rate due perhaps to high lending rate or some other conditions attached to credit facilities. Consequently, firms tend to look inwards to source for fund by ploughing back profit. This could be the reason why corporate income serves as a major source of investment in Nigeria. Even while the result indicated that the financial institution in Nigeria facilitated investment projects in the year under review, its influence on investment was halfway compared to corporate profit. Thus, corporate profit still serve as the major source of private investment in Nigeria and this is closely followed by financial deepening while lending rate was the least.

Imports are driven mainly by remittances and economic size. The propensity to import is also very strong since 10% increase in income will raise import demand by 7 percentage point. This suggests that Nigerians still have flair for imported products. The reason for this could be that they perceive imported goods to be of high quality or absence of import substituting products. It could also be the case that even when it is available and of equal quality, the price of imported good was relatively lower than the import substituting products. In order to check the robustness of our models, we replaced the models of elasticity with average change. The result of the robustness check presented in Table 5.4 shows how much consumption, investment and imports as a share of GDP are affected by changes in the share of remittances in GDP. Consumption share in GDP was affected by 0.4% when remittances share in GDP rose by 1 percentage point. Generally, the result reveals that imports share in GDP was more responsive to either consumption share or investment share in GDP. Again, consistent with the direction of effect in the elasticity model, the average change model shows that consumption's response to remittances is the least. Furthermore, credit to the private sector and lending rate are important to consumption, investment and imports.

**Table 5.3: Dynamic Structural Model Result
(share of each in GDP)**

	Consumption	Investment	Imports
Consumption(-1)	0.113** (2.01)		
Investment(-1)		0.22*** (4.48)	
Imports(-1)			0.513*** (3.03)
Remittances	0.0790*** (2.09)	0.334* (8.59)	0.347*** (14.76)
Credit_to_private	0.455** (8.80)	-0.0747** (-2.87)	2.400*** (14.39)
Dependency_ratio	-0.0228** (-11.55)		
Inflation	0.000214 (1.00)	0.000779*** (8.24)	-0.00294*** (-4.55)
Lending_rate	0.00354*** (4.34)	0.000655 (0.71)	0.0369*** (6.08)
Dispo_income	-0.662 (-1.48)		
Govt_spending	-1.048*** (-6.57)		
Lngdp		-0.0453*** (-9.97)	0.670*** (21.75)
Real_effective_exrate		0.186*** (11.38)	0.795*** (8.51)
Corporeate_income		-0.0682*** (-21.30)	
Constant	3.297*** (5.64)	-0.438*** (-7.22)	-4.195*** (-9.70)
Observations	35	35	35
R2	0.341	0.680	0.948
R2_a	0.163	0.594	0.936
Hansen p-value	0.933	0.741	0.060

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Other variables that significantly affected consumption include the lagged value of consumption, credit to the private sector, dependency ratio, lending rate and disposable income.

Conclusion and policy recommendations

Investigating the use of remittances is very important in order to see whether the use is productive or not. If a large proportion of remittances were used for domestic consumption and investment, or used to purchase imported intermediate goods, it can be considered as productive. Furthermore, if a sizable amount could be put in interest yielding asset, remittances can be considered productive. Otherwise it will be nonproductive and consequently frustrates the success of macroeconomic policies. We carried out an investigation on how Nigerian remittance receivers use the money at the macro level. We decomposed the use of remittances into three, namely consumption of private goods and services, private

investment and imports. Imports are used to capture nonproductive use while private investment and consumption are used to capture productive use. With the aid of dynamic structural specification, it was found that remittances play a significant role in all the three uses. Meanwhile, remittances more responsive to imports than consumption and investment. However, imported products is composed of final goods and intermediate goods which can be classified as productive. But going by the work of Orozco (2007), remittances were used mostly for acquiring home appliances, to celebrate birth day, funeral ceremony and for outing on weekends. The materials used for these purposes are imported final goods. Thus as remittances flows inwards, receivers use a large share of it to purchase imported products, thereby sending the money back to where it comes from but enjoys imported goods. This result is in line with some studies carried out at the micro level such as that of Combes and Ebeke (2011), Medina and Cardova (2010) and Quartey (2006). Our study also supports the findings of Ratha (2003) where it was argued that remittance are used to acquire locally produced goods. As shown in our result, purchase of locally produced goods will increase if remittances increase. Our result shows that remittances are used to raise the demand side of the economy but not the supply side. This way of using remittances have important implication on the economy. First, overheating the demand side without a corresponding supply response may lead to demand pull inflation. Second, because a large part of this inflow is used to consume imported products, it can contribute to exchange rate depreciation. Three, since the money is used for improving the conditions of the recipients, it makes it possible for government to divert development spending to another use, thereby making remittances a fungible resource. However, there are some policy issues that emerge from our study which should be resolved in order to have a clear picture about the use of remittances in Nigeria at the macro level. The first issue has to do with imported goods. Aggregation of imported goods does not allow us to conveniently claim that imported goods are nonproductive. The second issue has to do with the use of remittances on the development of human capital, in this case, education and health. Evidence shows that a proportion of remittances are spent on education and healthcare. This type of use can be classified as productive provided the factor inputs are sourced from domestic origin. Hence, more information is needed about the structure and pattern of private health and education expenditure. Unfortunately data on private health expenditure is elusive while data on private schooling is not easily accessible⁶. In spite of these set back, the additional knowledge that this work provides is that remittances are more effective for imported (somehow non-productive) goods in Nigeria. Thus, the study warns that if government and the monetary authorities did not find a way of making the fund attractive for domestic investment, such conspicuous spending may make nonsense of the authorities' policies.

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⁶ The NBS started computing data on private enrollment. However, private spending on education is yet to be made available for public use

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Appendix

Results of OLS

Variables	Consumption	Investment	Imports
Credit_to_private	0.108 (1.28)	-0.129 (-0.66)	0.913*** (9.07)
Dependency_ratio	-0.613 (-0.53)		
Dispo_income	0.748*** (8.19)		
Lending_rate	0.0159 (1.68)	-0.0131 (-0.57)	0.0358 (1.10)
Inflation	-0.000867 (-0.59)	0.00592 (1.66)	-0.00208 (-0.41)
Govt_spending	0.119 (1.34)		
Lngdp		1.709*** (7.61)	0.551** (2.39)
Real_effective_exrate		0.527*** (3.69)	-0.193 (-1.10)
Corporate_income		-0.830*** (-4.90)	
Constant	2.827 (0.54)	-3.820*** (-3.89)	0.965 (0.72)
Observations	37	37	37
F	382.3	78.97	36.24
R2	0.988	0.944	0.862
R2_a	0.985	0.932	0.83
Reset: chi value (f-stat)	1.98(0.143)	11.84(0.00)	5.88(0.003)
B-g/c-w hetero: chi-value(f-stat)	2.04(0.044)	1.31(0.052)	2.75(0.098)
Arch effect: chi-value(f-stat)	0.003(0.959)	0.006(0.931)	6.123(0.013)
B-g/lm auto: chi-value(f-stat)	3.533(0.062)	13.612(0.00)	15.098(0.001)
Durbin-watson:	1.457	2)	0.721

t statistics in parentheses

*p < 0.05, **p < 0.01, ***p < 0.001

OLS result share of the variables in GDP

	Consumption	Investment	IMPORTS
Credit_to_private	0.200* (2.15)	-0.129 (-0.66)	0.200 (0.80)
Dependency_ratio	-1.451 (-1.24)		
Dispo_income	0.881*** (8.00)		
Lending_rate	0.0186 (2.05)	-0.0131 (-0.57)	0.00873 (0.31)
Inflation	0.000901 (0.54)	0.00592 (1.66)	-0.00177 (-0.40)
Govt_spending	-0.101 (-0.72)		
Remittances	0.152 (1.97)	0.527*** (3.69)	-0.211 (-1.40)
Lngdp		1.709*** (7.61)	0.772** (3.02)
Corporate_income		-0.830*** (-4.90)	
Constant	6.469 (1.23)	-0.176 (-0.32)	-1.637* (-2.76)
Observations	37	37	37
F	362.0	78.97	49.16
R2	0.989	0.944	0.894
R2_a	0.985	0.932	0.83
Reset: chi value (f-stat)	1.61(0.214)	3.14(0.043)	5.88(0.023)
B-g/c-w hetero: chi-value(f-stat)	1.401(0.063)	4.022(0.019)	2.751(0.097)
Arch effect: chi-value(f-stat)	0.049(0.824)	8.462(0.003)	6.123(0.013)
B-g/lm auto: chi-value(f-stat)	4.051(0.044)	14.058(0.002)	15.098(0.001)
Durbin-watson:	1.445	0.755	0.721

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
