

## Does the End Use of Remittance Matter? A Macro Simulation of the Nigerian Economy

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### Abstract

International remittance has changed the landscape of international migration from brain drain to brain circulation; and provided the developing countries the opportunity to raise alternative sources of consumption and investment financing. However, the tendency that remittances will be poverty-reducing as well as growth-financing depends on its end use, particularly in import-dependent economies. The importance of focusing attention on the use of remittances is to checkmate early signs of another round of potential Dutch Diseases Syndrome which bedeviled the Nigeria's oil sector from occurring in remittance. Macro-econometric model with six behavioral equations and six identities were used to estimate and simulate the effects of remittances inflow on aggregate demand in Nigeria. The simulation result shows that the much touted poverty-reducing effect of remittances is non-growth-financing for import-dependent country like Nigeria because of its negative impact on current account balance; despite its positive effects on private consumption and investment.

**Keywords:** Nigeria, remittance, consumption, investment, import demand, macroeconometric model

### 1. Introduction

Nigeria like most developing countries has had its fair share of political instability and economic stagnation that consequently resulted in upsurge in the volume of migrants and brain drain to the outside world, which in itself, constituted a drag in the socioeconomic development of Nigeria. In 2010, statistics shows that Nigeria has a pull of stock of emigrants of about 1.0 million with the United States, the United Kingdom, Chad, Cameroon, Italy, Benin, Côte d'Ivoire, Spain, Sudan, Niger being the top ten highest recipients of Nigerian emigrants (World Bank, 2011). In the past, Nigerian migrants were only portrayed in the negative sense either in hard drug related cases, money laundering, child trafficking and financial crimes or "419", but today, remittances from Nigerian migrants have become the single largest source of capital flow and a contributor to household welfare and poverty reduction. Available data shows that remittance is the second largest source of foreign exchange next to oil. The work of (Goldberg and Levi, 2008) recorded that remittances inflow to Nigeria was about US\$3.2 billion in 2005, 14.8 per cent annual increase from 1995-2005, while the CBN statistics shows that it increased to US\$18 billion in 2007, 50 per cent higher than the World Bank estimate in the same period. If the CBN official estimate is correct, then Nigeria is the fifth largest destination in the world behind India, China, Mexico, and Philippine. The current World Bank report in 2011 shows that it hovers around \$10 billion, about 5.3 per cent increase from the 2009 estimate, and more than three-times net FDI inflows; thus, making it the world's top tenth recipient country in 2010.

Globally, the contribution of remittances both as a source of external funding and poverty reduction, especially in the developing economies continues to attract important economic discuss. For example, see studies by (Odimuko and Riddell, 1979); (Ratha, 2004); (Nwajiuba, 2005); (Ghosh, 2006); (Ambrosius, 2006); (Kireyev, 2006); (Orozco, 2007); (Gupta, Pattillo, and Wagh, 2007); (Lindley, 2008); (Ratha, 2009); (Ratha, Sanket, and Vijayalakshmi, 2009); (Purnima Mane, 2011); (Sackey, 2011); and (Gupta and Tyagi, 2012). According to the World Bank report in 2011 there are 215.8 million migrants around the world, representing about 3.2 per cent of the world's population. It further shows that since 1995 the global inward remittances amounted to more than \$2 746.9 billion of which 71 per cent or \$1 950.5 went to the developing economies. The top ten destinations include: India (\$55.0 billion); China (\$51.0 billion); Mexico (\$22.6 billion); Philippines (\$21.3 billion); France

(\$15.9 billion); Germany (\$11.6 billion), Bangladesh (\$11.1 billion); Belgium (\$10.4 billion), Spain (\$10.2 billion); and Nigeria (\$10.0 billion). Of interest also is that Sub-Saharan Africa SSA accounts for about 10 per cent of the world's stock of migrants representing 2.5 per cent of its total population; and remitting more than \$120 billion, equivalent to 4 per cent of the world remittances and 6 per cent of developing country. Of this, Nigeria accounts for about 50 per cent of the total remittances inflow to SSA and 77 per cent of the total remittance inflow to West African Countries.

The questions however, without prejudice to the existing studies which suggest that remittance is growth-enhancing and poverty-reducing, is whether this huge inflow actually translated into poverty reduction and economic growth? Does the story of growth and poverty at the global, Sub-Saharan Africa SSA, and Nigeria in particular support these findings; or is it that remittance has poverty-reducing potential that is yet to be harnessed. Perhaps a brief overview of the trends in poverty vis-à-vis remittance inflow will help clear the air on the poverty-reducing potentials and poverty-reducing impact of remittances in the destination countries. This will further buttress the points made by studies like (Adams Jr., Richard H, Cuecuecha, Alfredo; and Page, John, 2009) which question the uses of remittance as distinct from remittance impact analysis. As was rightly observed by (Ratha, 2004) that there is tremendous potential for using remittances to encourage development in countries. Yet, though much progress has been made toward understanding remittances, their potential impact is significantly reduced. Thus, development policymakers will need much more research on how to use remittances so that they positively contribute to migrants' home communities and countries.

At the global and regional level, using the 2005 PPP and \$1.25/day poverty line, one observes a negative correlation<sup>1</sup> between poverty headcount in the world and SSA and remittance inflow. Globally, remittance increased from 0.3 per cent in 1984 to about 18 per cent and 61 per cent in the periods 1993 and 2008 respectively; while poverty headcount fell from 52 per cent in 1981 to about 41 per cent and 22 per cent in 1993 and 2008 respectively; for Sub-Saharan Africa poverty headcount rose from 53 per cent in 1981 to 59 per cent in 1993 before declining to 48 per cent in 2008, as remittances increased from -19 per cent in 1984 to 39 per cent and 127 per cent in 1993 and 2008 respectively; while for Nigeria poverty headcount rose from 54 per cent in 1985 to 63 per cent and 68 per cent in 2003 and 2009 respectively. Remittances inflow rose from (-17 per cent) in 1981 to (-12 per cent) and 8 per cent in 2003 and 2008 respectively. What it means is that at the global and regional level remittance may have reduced poverty, but within countries poverty is still pervasive despite the increase in remittance.

In the foregoing context, and given the peculiarity of the developing countries as consuming, and in most cases import-dependent; study on remittance-economy interaction is in the second phase of enquiry which attempts to answer the question about the uses of remittance. Inquiry about the uses of remittances predisposes that its use determines its socioeconomic effect. And it is in this context that the current student attempts to examine how remittance inflow into Nigeria is used as against the numerous impact studies in Nigeria.

### *1.2 Policy gap in perspectives*

The Excitement about the supposed negative a priori relationship between remittance and poverty assumed-away the fact that this straight jacket relationship can only hold in a closed economy; which even when assumed negates the nomenclature of remittance from existing in the first place. Ideally, putting away trade effects, one can, without any contradiction generate the kind of conclusion that remittance is both poverty-reducing and growth-enhancing. Under such strict, but unrealistic assumption, remittance will reduce poverty; impact savings and investment; and consequently enhance economic growth. But in a global economy, the interaction between remittance and the aggregate economy is beyond the rule-of-thumb approach, considering the positive relationship between increase in income and demand for import and the attendant exchange rate and potential Dutch Disease Syndrome DDS effects - Nigerians are living witnesses to the oil-poverty-growth paradox and the resources curse hypothesis.

Notwithstanding the conclusions that remittances inflow to Nigeria is poverty-reducing, its growth-financing potential poses another challenging research question; given the country's non-inclusive growth and import-dependent posture. On the interaction between remittances, poverty and the aggregate economy, it is evident that the country receives about 50 per cent of the total remittance inflow to SSA, yet poverty increased from 54 per cent in 2004 to about 69 per cent and 72 per cent in 2010 and 2011 respectively. Thus, if it is true that remittance reduces poverty, its impact is short-lived and unsustainable and there could be a negative shockwave from the

aggregate economy such that the macroeconomic effects of remittance out-clouded the poverty reducing effects, resulting to welfare loss and increase in poverty in the long run. Consequent upon that is the need to address the question about what recipients do with remittance, particularly given that consumer goods constitute more than 43 per cent of Nigeria's total import demand.

While the current study does not align with the opinion that remittance inflow to Nigeria has attracted little attention from writers; it rather posits that existing studies as tremendous and overwhelming as they are, were either targeted mainly at the household level – poverty and inequality; while the macro components fairly dealt with either the determinants of remittances or the generalization of the impact of remittances on growth. Like most studies in Sub-Saharan Africa SSA, its long-term interaction with macro economy is unclear. Studies by (Lindley, 2008); and (Gupta, Pattillo, and Wagh, 2007) respectively observed that in spite of the fact that SSA constitutes about 8.4 per cent of the world's 190 million stock of migrants in the past 20 years, the long-term development potentials impacts of what remains after consumption is unclear; nonetheless studies relying on household data from different countries yield some insights into core, private intra-family or intra-community income transfers that directly address poverty.

What it shows is that remittance in a wider sense transcend micro impact assessment and may have more serious implications for major macroeconomic variables like private consumption expenditure, domestic price level, exchange rate, interest rate, trade flow, and consequently on the aggregate economy- which would ultimately affect internal and external balances of the recipient country. Moreover, in a small open economy such as Nigeria with a shallow foreign exchange market and insufficient instruments for the conduct of monetary policy resulting from low credibility and autonomy of the central bank, the sheer magnitude of foreign currency inflows and their pronounced seasonal pattern could create significant uncertainties for monetary management, large impulsive transmission mechanism and the attendant overshooting of reserve money targets and higher inflation (Kireyev, 2006). And finally, because remittances will respond to changes in economic conditions in both the receiving and originating countries, such as the current global financial crunch, it tends to act as a source of external shock resulting to balance of payment crisis to the receiving economy (Loser, Lockwood, Minson, and Balcazar, 2006).

Given this, it is reasonable to suppose that there are two (positive and negative) opposing effects of remittance on the recipient economy whose net outcome depends on the relative strength of the push (factor that push household to poverty) and pull (factors that push them out of poverty) factors. The current study attempts to answer the question bothering on what households receiving remittances do with it; and whether remittance is growth-financing. It used quarterly macro level data from Central Bank of Nigeria's Macro-econometric Model of the Nigerian Economy 1981-2007 to add some insights into Nigeria country-specific role of remittances; their uses and how it impacts on the aggregate economy.

### *1.3 Objective and research problem*

Generally, the purpose of this study is to ascertain the impact of international remittance inflow on aggregate spending in Nigeria. Specifically, it addresses the following objectives: (1) evaluating the impact of remittances on food and non-food consumption; oil and non-oil investment; and consumer and non-consumer import demand; (2) identifying what household do with remittance through a scenario building using macro-econometric model simulation.

## **2. Review of Studies on Remittances in Nigeria**

There are three generic groups of studies on remittances in Nigeria: analytical issues; micro; and macro level studies. Analytically, (Odumuko and Riddell, 1979) dealt with urban-rural cash remittances in the South-Eastern Nigeria; (Nwajiuba, 2005) exemplified the general characteristics of migrants in the southern Nigeria; while (Hernández-Coss and Bun, 2007) studied the analytical issues relating to UK-Nigeria remittances corridor. In another study, (Chukwudi, Olise, and Ewuim, 2011) stressed that migrants' remittal enterprise plays a role in investment and enterprise growth; and sorts Governments support and protection for Nigerian migrants in order to protect and respect their human rights, and to ensure that they are not exploited; and that their earnings in the host countries are safeguarded.

At the micro level (Chukwuone, Amaechina, Iyoko, Enebeli-Uzor, and Okpukpara, 2007); (Ajayi, et al., 2009); (Olowa O. , 2009); (Odozia, Awoyemia, and Omonona, 2010 ); (Fonta, Onyukwu, and Nwosu, 2011); (Babatunde and Martinetti, 2011); and (Olowa and Shittu, 2012) studied the impact of remittances on poverty

and inequality; and concluded that remittance reduces poverty and inequality, hence welfare-improving; but (Olowa O. , 2009) went beyond the welfare implication and concluded that, it is counter-cyclical; which also has implication for economic growth. Apart from the consumption consequence of remittances, (Osili, 2005) investigated migrants' housing investments in their communities of origin, aligning with literature that seeks to understand the economic ties that migrants maintain with their origin communities. Among the conclusions in the study is that migrants to a very large extent have ties with their respective communities by channelling part of the remittance to house investment. The house investment reduces remittances to households at home, but rises as the house is completed. Thus, the importance of remittances is its investment and altruistic use.

The macro counterpart was concerned with the determinants of remittances inflow. That was the primary focus of (Ojapinwa, 2012) which identified real GDP, labour market situation and population growth rate as major determinants of remittances. Other macro level analyses include (Uadiale, Oke, and Okpala, 2011) which found a positive link between remittances and financial through its impact on loanable funds; (Kure and Nwosu, 2008); (Udah, 2011) found a positive impact of remittances on economic macroeconomic, via human and material investment.

One take from the foregoing is that the outright conclusion about the positive impacts of remittances inflow on growth and poverty-reducing seems to have ignored the outright consequences of increased in income and the growing import demand in Nigeria. Summary of Nigeria's trade statistics shows that aside oil it has a consistent unfavourable balance of payment since the late 1970s. To cap it all, bulk (43 per cent) of the total import into the country is consumer goods; while capital and intermediate goods account for about 40 per cent and 17 per cent respectively. If higher proportion of remittance inflow is spent on consumption, particularly on import; where will the growth-financing impact of remittance come from so as to reduce poverty? This has question has pushed the frontier of research away from impact analysis to the uses of remittances.

### 3. Methodology

To simulate the aggregate spending effects of remittance, a four-sector Keynesian dynamic macro econometric model with six behavioural equations and six identities were estimated. The behavioural equations are: consumption (food and non-food); investment (oil and non-oil); and import demand (consumer and non-consumer goods) equations; while the identities are: private consumption and investment; net export, government spending, and aggregate demand. All the variables are real variables.

In answering the question on what households do with remittances, four uses namely, consumption; investment; health; and education spending were identified by (Ratha, 2009). However the NBS data generating process DGP included health and education spending, together with clothing and footwear, rent, fuel/light, household goods, transport, water, entertainment, and other services as constituting the non-food consumption (NBS, 2012). The study follows this classification which appeals to Keynesian DD model.

#### 3.1 The Model

##### 3.1.1 Household (consumption block)

Private consumption (CO) is disaggregated into food consumption (CF) and non-food consumption (CN). The predictors of consumption in Nigeria (combining economic theory and Nigeria country-specific peculiarities- both from research and intuitive reasoning) include income (Yi), prices<sup>ii</sup> of core (non-food) and non-core items (food items), exchange rate (REER), remittances (RMT), and deposit rate (SVR)- controlling for savings. The predictors of food and non-food consumption are specified in equations (1) and (2), while case (3) is the consumption (CO) identity that closes the private consumption block.

$$CF = \alpha_0 + \alpha_1 REER + \alpha_2 Y_i + \alpha_3 RMT + \alpha_4 SVR + \alpha_5 G + \mu_1 \quad (1)$$

$$CN = \alpha_6 + \alpha_7 REER + \alpha_8 Y_i + \alpha_9 RMT + \alpha_{10} SVR + \alpha_{11} G + \mu_2 \quad (2)$$

$$CO = CF + CN \quad (3)$$

##### 3.1.2 Firm (investment block)

The model of private investment (INV) relied, in addition to the traditional Keynesian approach, on irreversibility theory of investment which incorporate business environment. We found this theory specifically

appealing in the case of Nigeria, given that interest rate in Nigeria is over identified; and coupled with the weak link between interest rate and the real sector which prompted the use of quantitative easing by the monetary Authorities to stimulate the economy. Determinants of private investment is modelled to include average lending rate (RD), domestic output (YO), real exchange rate (REER), gross domestic savings (GDS); financial deepening (FD) to account for mobilization of funds; remittance inflow (RMT), and business environment (macroeconomic volatility). Cases 4 and 5 are the behavioural equations; the identity is defined in case (6). The sector is disaggregated into oil (INVO) and non-oil (INVN) investment.

$$INVN = \beta_0 + \beta_1 RD + \beta_2 REER + \beta_3 FD + \beta_4 RMT + \beta_5 YO + \beta_6 BUS + \beta_7 GDS + \mu_3 \quad (4)$$

$$INVO = \beta_8 + \beta_9 RD + \beta_{10} REER + \beta_{11} FD + \beta_{12} RMT + \beta_{13} BUS + \beta_{14} GDS + \mu_4 \quad (5)$$

$$INV = INVO + INVN \quad (6)$$

### 3.1.3 External sector (External block)

Import (M) is disaggregated into consumer (MC) and non-consumer (MN) goods. Non-consumer goods are intermediate and capital goods. Import demand is modelled to depend on real effective exchange rate (REER), income (Yi), remittances (RMT), and international trade restrictions captured with implicit tariff rate (TAR). In addition, net export (NX) is specified as the difference between export (X) and import demand (M). Accordingly, equations 7 (import of consumer goods) and 8 (import of non-consumer goods) are the predictors of import demand. Cases 8 and 9 are import and net export identities.

$$MC = \chi_0 + \chi_2 REER + \chi_3 Yi + \chi_4 RMT + \chi_5 TAR + \mu_5 \quad (7)$$

$$MN = \chi_6 + \chi_7 REER + \chi_8 Yi + \chi_9 RMT + \chi_{10} TAR + \mu_6 \quad (8)$$

$$M = MC + MN \quad (9)$$

$$NX = X - M \quad (10)$$

### 3.1.4 Government sector (Government block)

Government consumption expenditure is model strictly as exogenous variable; it is specified as an identity. Government is the largest consumer in the economy and has been identified as the source and effect of changing aggregate consumption, partly because of the increasing size and the attendant corruption in the economy.

$$G = G_0 \quad (11)$$

### 3.1.5 Aggregate economy (Aggregate demand)

Following the traditional Keynesian aggregate demand (DD) identity, we close the model as the sum of private demand (private consumption and investment); exogenous government consumption (G); and net export.

$$DD = CO + INV + G_0 + NX \quad (12)$$

## 4. Presentation and Analysis of results

### 4.1 Data handling and regression results

All the variables were tested for unit root and co-integration, but for brevity the results are not presented. Apart from remittance that is integrated of order-two, others are integrated of order-one. Explanatory variables with the same order of integration with their respective endogenous variables are found to be co-integrated except

consumption of food and non-food. Consequently, error correction models were used for investment and import demand equations. The error correction (ECM) variables used in the equations are: ECM\_INVN (investment-non-oil); ECM\_INVO (investment-oil); ECM\_MC (import of consumer goods); and ECM\_MN (import non-consumer goods).

Table 1 (appendix A) depicts the determinants of consumption; investment; and import demand. It also contains the long run (LR) co-integrating equations of investment and import. Determinants of consumption include: remittance, income, real exchange rate, and government consumption expenditure; investment: financial deepening, remittances, business environment, real exchange rate, gross domestic savings, and domestic average lending; while import restriction, remittances, income, and real exchange rate are determinants of import demand.

#### *4.2 Simulation experiment*

Table 2 shows one-period percentage change (annual) of the baseline simulation (in-sample) scenario of 5 per cent and 15 per cent<sup>iii</sup> increase in migrant remittances inflow on total consumption (CO), consumption of food (CF) and non-food (CN); total private investment (INV), investment-oil (INVO) and investment non-oil (INVN); total import demand (M), import of consumer (MC) and non-consumer (MN) goods; net export (NX); and finally on aggregate demand (DD).

On the average, increase in remittances inflow increases consumption by about 1.7 per cent; with 1.6 per cent allocated to food while 1.7 per cent is allocated to non-food – consumers attach equal weights to both food and non-food, though non-food is marginally higher. Investment in the non-oil sector increases by 19 per cent, while oil-sector increases by 19.4 per cent giving an average of 18 per cent increase in total private investment. On the other hand, total import demand will rise by 23 per cent out of which demand for consumer goods accounts for 29 per cent while non-consumer goods accounts 20 per cent. On the average, aggregate demand will decrease by about 0.8 per cent resulting from the decline in current account balance by average of 17 per cent; that is 12.7 per cent (5 per cent simulation) and 21.7 per cent (15 per cent simulation) respectively. Figure 1 is a summary of percentage distribution of aggregate spending effect of remittances extracted from simulation experiment in table 2.

Thus, if remittance is poverty-reducing, there must be an unknown transmission mechanism; because obviously from the simulation result in table 2 it might not be through economic growth because of the negative growth effect associated with the balance of payment deficit. Although there are improvements in domestic investment (oil and non-oil); and smoothing consumption (food and non-food); they were not strong enough to offset the negative consequences of current account deficit associated with high import demand. Considering that economic growth has inverse relationship with poverty; the observed negative effect of remittances on macro economy is expected to have adverse effect on poverty. Thus, the conclusion that remittances decreases poverty and inequality may be a short run phenomenon or that the impact of remittances as increasing function of consumption is misunderstood to be poverty-reducing.

#### **5. Conclusion**

The paper examines the macroeconomic effects of migrant remittances inflow to Nigeria using a small macro-econometric model. The selected macroeconomic variables are consumption; private investment; import demand; and net export.

The simulation result revealed two important findings. It confirms the importance of migrant remittances as both sources of direct and deferred consumption through its impact on private consumption and investment. Recipients of remittances spend more on investment than on consumption. However, the investment component of remittance spending is not strong enough to off-set the negative impact of import demand; thus, raising the fear that growth-financing of remittances inflow is neutralised by high-import dependence of the country.

Instructively the benefits of remittances can only be growth-financing if the destination country has a policy of import substitution particularly for consumer goods. Further study is however, required to ascertain whether the multiplier effect of the increase in investment and the attendant employment by-product could off-set the balance of payment deficit effect.

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**Appendix A:** Regression results and baseline simulation experiment

Table 1: Regression results

<u>CONSUMPTION FOOD</u> Variable	<i>Dep. Var:</i> Coefficient	DLOG(CF) Std. Error	t-Statistic	Prob.
DLOG(CF(-1))	0.5547	0.0717	7.7331	0.0000
DLOG(RMT(-4),2)	0.0733	0.0155	4.7204	0.0000
DLOG(YI(-4))	0.0753	0.0289	2.6049	0.0107
DLOG(G(-4))	-0.1407	0.0438	-3.2148	0.0018
D(SVR(-8))	-0.0007	0.0004	-2.0010	0.0483
DLOG(REER(-5))	-0.0834	0.0282	-2.9620	0.0039
<u>CONSUMPTION NON-FOOD</u> Variable	<i>Dep. Var:</i> Coefficient	DLOG(CN) Std. Error	t-Statistic	Prob.
DLOG(CN(-1))	0.5529	0.0748	7.3929	0.0000
DLOG(RMT(-4),2)	0.0524	0.0151	3.4786	0.0008
DLOG(YI(-4))	0.0663	0.0283	2.3460	0.0210
DLOG(G(-4))	-0.1302	0.0427	-3.0482	0.0030
DLOG(REER(-5))	-0.1033	0.0280	-3.6966	0.0004
<u>EQ01 LRINVN</u> Variable	<i>Dep. Var:</i> Coefficient	LOG(INVN) Std. Error	t-Statistic	Prob.
LOG(YO(-1))	0.2425	0.0293	8.2634	0.0000
LOG(REER(-1))	0.0423	0.0585	0.7230	0.4713
LOG(FD(-1))	-0.1546	0.1446	-1.0692	0.2875
RD(-1)	-0.0018	0.0017	-1.0560	0.2935
LOG(GDS(-1))	0.8441	0.0370	22.8086	0.0000
<u>EQ02 LRINVO</u> Variable	<i>Dep. Var:</i> Coefficient	LOG(INVO) Std. Error	t-Statistic	Prob.
LOG(YO(-1))	-0.1615	0.1278	-1.2641	0.2091
LOG(REER(-1))	0.0573	0.0689	0.8323	0.4072
LOG(FD(-1))	-0.4186	0.1656	-2.5279	0.0130
RD(-1)	-0.0029	0.0019	-1.5438	0.1258
LOG(GDS(-1))	0.8501	0.0397	21.4062	0.0000
C	4.2554	1.6807	2.5319	0.0129
<u>EQ03 LRMC</u> Variable	<i>Dep. Var:</i> Coefficient	LOG(MC) Std. Error	t-Statistic	Prob.
LOG(YI(-1))	0.8259	0.0219	37.7957	0.0000
LOG(REER(-1))	-0.2510	0.0612	-4.1037	0.0001
LOG(TAR(-1))	-0.3795	0.0767	-4.9474	0.0000

<u>EQ04_LRMN</u> Variable	Dep. Var: Coefficient	LOG(MN) Std. Error	t-Statistic	Prob.
LOG(YI(-1))	0.8902	0.0219	40.6096	0.0000
LOG(REER(-1))	-0.1698	0.0614	-2.7680	0.0067
LOG(TAR(-1))	-0.4299	0.0770	-5.5867	0.0000

<u>IMPORT CONSUMER GOODS</u> Variable	Dep. Var: Coefficient	DLOG(MC) Std. Error	t-Statistic	Prob.
DLOG(MC(-2))	0.1661	0.0616	2.6988	0.0083
DLOG(RMT(-7),2)	0.1941	0.0762	2.5477	0.0125
DLOG(YI)	0.4480	0.1502	2.9816	0.0037
DLOG(REER)	-0.4661	0.1416	-3.2926	0.0014
DLOG(TAR)	-0.6870	0.0854	-8.0447	0.0000
ECM_MC(-1)	-0.3082	0.0584	-5.2728	0.0000

<u>IMPORT NON-CONSUMER GOODS</u> Variable	Dep. Var: Coefficient	DLOG(MN) Std. Error	t-Statistic	Prob.
DLOG(RMT(-6),2)	0.2498	0.0728	3.4314	0.0009
DLOG(YI(-7))	0.5422	0.1420	3.8192	0.0002
DLOG(REER(-1))	-0.3286	0.1328	-2.4745	0.0151
DLOG(TAR)	-0.9560	0.0807	-11.8427	0.0000
ECM_MN(-1)	-0.1890	0.0599	-3.1549	0.0022

<u>INVESTMENT NON-OIL</u> Variable	Dep. Var: Coefficient	DLOG(INVN) Std. Error	t-Statistic	Prob.
DLOG(INVN(-5))	0.3676	0.0894	4.1139	0.0001
DLOG(FD(-4))	1.2229	0.2812	4.3496	0.0000
DLOG(RMT,2)	0.4370	0.1163	3.7568	0.0003
DLOG(YO)	1.1833	0.4365	2.7108	0.0081
DLOG(BUS(-4),2)	-1.0336	0.2989	-3.4577	0.0008
D(RD(-8))	-0.0078	0.0026	-3.0529	0.0030
DLOG(REER(-9))	0.4031	0.1892	2.1302	0.0359
DLOG(GDS(-1))	0.9435	0.2159	4.3711	0.0000
ECM_INVN(-1)	-0.6834	0.2189	-3.1220	0.0024

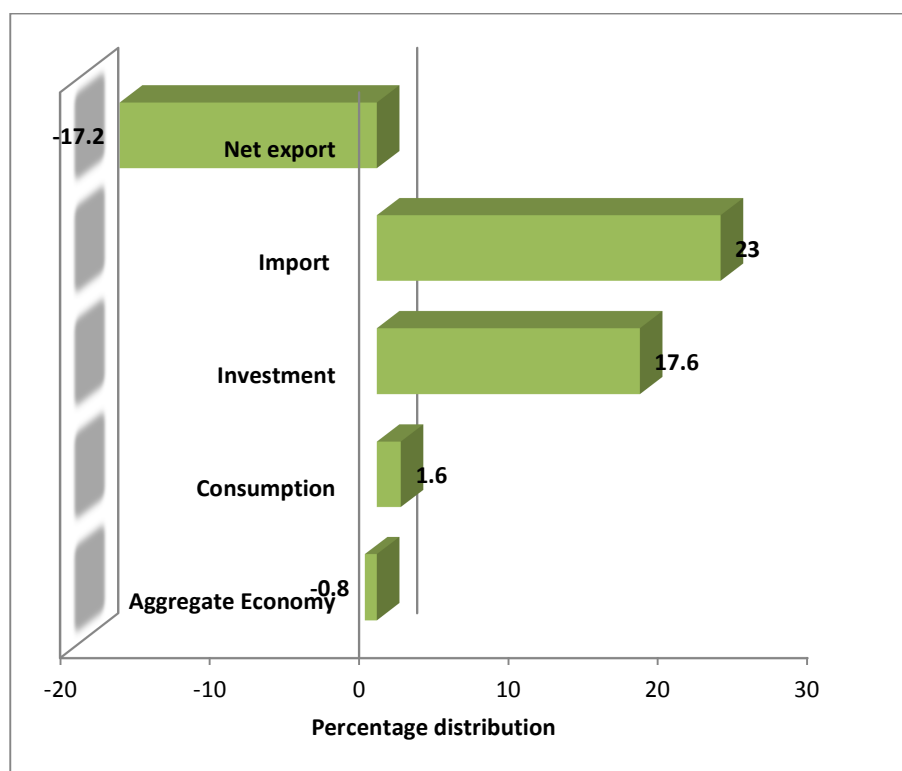
<u>INVESTMENT OIL</u> Variable	Dep. Var: Coefficient	DLOG(INVO) Std. Error	t-Statistic	Prob.
DLOG(INVO(-5))	0.4609	0.0820	5.6191	0.0000
DLOG(FD(-4))	1.2047	0.2863	4.2083	0.0001
DLOG(RMT,2)	0.2890	0.1082	2.6715	0.0089
DLOG(BUS(-7),2)	-0.7300	0.2565	-2.8456	0.0055
D(RD(-8))	-0.0066	0.0027	-2.4217	0.0174
DLOG(REER(-8))	0.3822	0.1904	2.0076	0.0476
DLOG(GDS(-1))	1.1606	0.1645	7.0547	0.0000
ECM_INVO(-1)	-0.8759	0.1508	-5.8074	0.0000

Source: Regression results

Table 2: Baseline simulation experiment of macroeconomic effects of Migrants' remittances

Element	5 percent													15 percent												
	CF	CN	CO	DD	INV	INWN	INVO	M	MC	MN	NX	CF	CN	CO	DD	INV	INWN	INVO	M	MC	MN	NX				
1994	3.1	2.2	2.7	-9.8	-36.5	-37.5	-34.5	-8.8	4.5	-13.0	-12.9	3.7	2.63	3.2	-9.7	-36.3	-37.3	-34.3	-8.8	4.5	-13	-13				
1995	12.3	6.0	9.6	4.0	-21.4	-11.3	-40.6	23.0	68.4	5.8	2.5	13.6	6.87	10.8	4.6	-20.2	-10	-39.9	25.9	71.2	8.7	2				
1996	-1.8	-1.8	-1.8	-10.8	-42.8	-36.9	-59.5	74.7	133.1	39.5	-18.8	-1.7	-1.73	-1.7	-10.8	-42.3	-36.5	-59.2	75.2	135.2	39.5	-19				
1997	0.1	5.0	2.1	-6.0	-26.7	-20.9	-52.0	145.2	178.2	111.9	-21.1	0.1	4.96	2.1	-6.1	-26.4	-20.8	-51.9	145.2	178.3	111.9	-22				
1998	19.1	24.5	21.3	-1.4	-11.0	-7.2	-39.3	9.0	14.8	1.4	-50.0	19.1	24.45	21.3	-1.2	-10.9	-7.1	-39.2	9	14.8	1.4	-51				
1999	8.1	10.7	9.2	-6.7	-49.7	-49.6	-50.0	77.7	67.9	92.2	-85.7	8.1	10.66	9.2	-6.9	-49.6	-49.6	-50	77.7	67.9	92.2	-89				
1990	11.2	5.1	8.5	-1.5	-3.2	0.1	-40.2	43.3	63.6	16.7	-55.5	11.2	5.13	8.5	-1.6	-3.2	0.1	-40.1	43.3	63.6	16.7	-71.2				
1991	-6.3	-5.2	-5.8	-24.2	-35.7	-34.0	-67.6	54.8	43.8	74.9	194.4	-6.3	-5.16	-5.8	-24.5	-35.7	-34	-67.6	54.8	43.8	74.9	183				
1992	-4.7	1.7	-2.0	-14.3	-17.6	-16.7	-52.6	-4.2	-12.8	8.9	29.5	-4.7	1.65	-2	-14.3	-17.6	-16.7	-52.5	-4.2	-12.8	8.9	28				
1993	10.4	9.6	10.1	4.3	13.6	14.2	-28.7	12.7	8.4	17.8	23.6	10.4	9.63	10.1	4.3	13.6	14.2	-28.7	12.7	8.4	17.8	23				
1994	-2.9	-5.3	-4.0	4.5	53.6	54.4	-24.0	-23.0	-14.6	-32.4	-21.0	-2.9	-5.25	-4	5	53.6	54.4	-24	-23	-14.6	-32.4	-21				
1995	3.0	-0.9	1.3	-38.8	-35.3	-35.2	-58.4	64.8	74.3	51.5	81.4	3	-0.91	1.3	-39.4	-35.3	-35.2	-58.4	64.8	74.3	51.5	81				
1996	9.6	3.7	7.1	75.7	13.9	13.9	6.1	-41.3	-40.8	-42.1	-41.8	9.6	3.71	7.1	77.7	13.9	13.9	6.1	-41.3	-40.8	-42.1	-42				
1997	2.4	3.7	2.9	2.1	6.8	6.9	-14.0	7.0	-2.3	22.4	5.5	2.4	3.7	2.9	2.1	6.8	6.9	-14	7	-2.3	22.4	6				
1998	-10.0	-5.9	-8.3	-10.9	-3.8	-3.8	-27.3	-1.4	-13.0	13.9	-1.0	-10	-5.87	-8.3	-1.1	-3.8	-3.8	-27.3	-1.4	-13	13.9	-1				
1999	-8.4	-7.3	-8.0	8.4	-15.6	-15.5	-51.5	-31.8	-34.3	-29.3	-32.8	-8.4	-7.31	-8	8.6	-15.6	-15.5	-51.5	-31.8	-34.3	-29.3	-33				
2000	-5.1	-3.0	-4.2	1.9	24.5	24.5	-27.4	-18.1	-16.0	-20.1	-19.9	-5.1	-2.99	-4.2	2	24.5	24.5	-27.4	-18.1	-16	-20.1	-20				
2001	4.8	8.1	6.3	9.1	-45.5	-45.5	-72.1	-5.4	-14.1	3.1	-2.4	4.8	8.14	6.3	9.1	-45.5	-45.5	-72.1	-5.4	-14.1	3.1	-3				
2002	-5.6	-6.7	-6.1	2.8	139.3	139.3	226.9	-35.5	-45.2	-27.4	-37.8	-5.6	-6.67	-6.1	3	139.3	139.3	226.9	-35.4	-45.2	-27.4	-38				
2003	1.3	-0.2	0.6	-4.9	147.5	147.5	185.7	65.2	49.3	75.0	70.6	1.3	-0.2	0.6	-4.9	147.5	147.5	185.7	65.2	49.3	75	70				
2004	-2.0	-0.6	-1.4	10.8	238.7	238.7	340.7	0.7	9.0	-3.6	1.7	-2	-0.57	-1.4	11.6	238.7	238.7	340.7	0.7	9	-3.6	2				
2005	1.1	-0.4	0.4	13.0	70.5	70.5	131.0	-4.2	-1.1	-6.0	-4.2	1.1	-0.38	0.4	13.6	70.5	70.5	131	-4.2	-1.1	-6	-4				
2006	-2.5	-1.8	-2.2	-8.2	30.3	30.2	120.8	65.7	75.0	59.8	66.8	-2.5	-1.84	-2.2	-7.9	30.3	30.2	120.8	65.7	75	59.8	67				
2007	0.1	-0.8	-0.3	-20.0	27.9	27.7	193.5	80.1	99.8	66.5	85.3	0.1	-0.76	-0.3	-19.4	27.9	27.7	193.5	80	99.8	66.5	85				
Average	1.6	1.7	1.6	-0.9	11.6	18.9	19.4	22.9	29.0	20.3	-12.7	1.6	1.7	1.7	-0.7	17.7	19.0	19.4	23.1	29.2	20.4	-21.7				

Source: Simulation of macroeconomic model of Migrant remittances inflow to Nigeria.



**Figure 1: Summary of percentage distribution of aggregate spending effect of remittance**

Source: Authors' estimate based on simulation result

**Notes**

<sup>i</sup>419” is an acronym given to kind of fraudulent financial practices in Nigeria whereby unsuspecting business men and women, particularly foreigners, are dispossessed of their money and other financial assets with the ill intention of helping the victims secure contracts or even facilitate money transfer or claims under the disguise that the benefactor is or was a minister or any other well connected government official in Nigeria. It is derived from section 4(19) of the Nigerian Constitution which makes advance fee fraud an offence in the Nigeria criminal code. Most foreigners and even locals have fallen victims of this crime. It is one of the factors that present Nigerian emigrants and citizens in a negative sense.

<sup>ii</sup> A quick correlation using remittances in flow and poverty headcount shows that there is a negative correlation of 0.89 (world) and 0.8 (Sub-Saharan Africa); and for Nigeria there is a positive correlation of about 0.54 from the period 1985 -2009.

<sup>iii</sup> Prices of food and non-food items are excluded from the equations because the variables are real variables.

<sup>iv</sup> Studies by (Goldberg and Levi, 2008); and (World Bank, 2011) recorded that the average annual growth rate of remittances inflow to Nigeria from the period 1995-2005; and from 2009-2010 were approximately 15 per cent, and 5 per cent respectively. These figures were used for simulation.