Determinants of Migrants' Remittances in Nigeria: An Econometrics Analysis

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Introduction

1.1 Background/ Problem Statement

There has been a growing debate on how the often voluminous migrant remittances are used and to what extent they contribute to the development of the migrant's country of origin (Ratha 2003; Pernia 2006; World Bank 2008; Hanson and Woodruff, 2003; Cox-Edwards and Ureta, 2003; Obaseki 1991; Obadan 2004, Tomori and Adebiyi, 2007; Eke and Ubi, 2008; and Russell 1986; 1992 and 1995). This issue was included in the G8 meeting agenda of 2004 and in the spring meeting of the World Bank in May 2005, emphasizing the growing importance of migration and the associated migrant's remittances (Adenuga, 2008). There are surveys on how remittance recipients spend their income and discussions on how effective government policies are in attracting remittances. In fact, there is quite a literature, often negative, concerning the contribution of remittances to productive consumption and investment (Todaro 1969; Cattaneo 2005; Bridi 2005; Chami et al, 2004; Azam and Gubert 2006; Lucas 2004; Stahl 1982 and de la Fuente, 2000).

The 2006 World Bank Annual Global Economic Prospects Report shows that developing countries received remittances estimated at \$126. In 2007, estimates indicate that such remittances to developing countries totalled US\$240 billion out of the global amount of US\$318 billion though under-reported (Anyanwu and Erhijakpor, 2009). It was reported that official remittances alone were about 20 percent more than overseas development aid (ODA) to some developing countries like Nigeria from 1980-2005, and even more than foreign direct investment (FDI) and ODA in other countries like Morocco; thus serving as a good source of capital inflow. This has been shown to play an important role in the ability of migrants families to educate, provide shelter, healthcare as well as setting up of self-sustaining micro-finance schemes, and in poverty alleviation in Nigeria (Adenuga and Bala-Keffi, 2005).

Currently in Nigeria, as indicated in the National Economic Empowerment and Development Strategy (NEEDS) document, the Western Union Money Transfer Agency estimates that on the average, an important immigrant transfers US\$300 to relatives in Africa and the IMF estimates that the African in Diaspora now constitutes the biggest group of foreign investors in Africa: while in Latin America the immigrants send approximately US\$250 eight to ten annually. Though researchers have undertaken to estimate the magnitude and nature of remittances and investigate their impact on development of countries of origin it is seen that aside from Egypt in Africa little attention to the issue of remittances responds to the state of economic activity in the host countries (Sayan 2004).

Aside from the significance of this magnitude in the countries of origin, remittances are generally a less volatile, hence more dependable, source of funding than private capital inflows and foreign direct investment (FDI) (Ratha, 2003; Buch and Kuckulenz, 2004). Being unilateral transfers, they do not create any future liabilities such as debt servicing or profit transfers. Furthermore, remittances are argued to have a tendency to move counter cyclically with the GDP in recipient countries, as migrant workers are expected to increase their support to family members during down cycles of economic activity back home so as to help them in compensating for the loss family income due to unemployment or other crisis-induced reasons. Whenever true, such a counter cyclicality enables remittances to serve as a stabilizer that helps smooth out large fluctuation in the national income over different phases of business cycle. Yet, as shown by a considerable number studies in the literature, the decision to remit is a complex phenomenon involving other factor than the motivation to help finance current (as opposed to future) consumption spending of family members and relatives back home (see, for example Russell 1986).

Most research has found that the nominal exchange rate is a significant explanatory variable of migrant remittances. Lowell (2005) found this to be the case with remittances sent from the United States to Latin America and the Caribbean as did Lianos (1997) with remittances sent to Greece from immigrants living in Germany, Belgium and Sweden. Lianos found that Greek migrants adjust their remittances to exchange rate changes so that the same value in terms of drachmas is sent back home (Lianos, 1997, p 82). In contrast, Orozco concluded that exchange rate fluctuations do not affect remittance transfers to the Dominican Republic (Orozco, 2004, p 4). El-Sakka and McNabb Suggest that migrants might remit more during periods of inflation to secure the "purchase of real assets, such as land and jewellery, the real value of which may be constant or actually rising in times of inflation" (El-Sakka and McNabb, 1999, p 1499).

Given the foregoing, the questions are what are the macroeconomics determinants of remittances in Nigeria? What are the relationships between remittances and its determinants? Should there be deliberate policies to encourage or discourage the issue of remittances? In view of the unfolding reality coupled with the protracted debates, this paper attempts to critically examining the determinants of remittances in Nigeria using econometric modelling and finally to suggesting appropriate policy strategies to improve on its inflow. To this end, the rest of the paper is organized thus. Following this introduction is part II, which examine theory of migrants' remittances; Part III discusses the method and the results and the final part contains the summary, conclusion and policy implications.

2.1 Theory of Remittances

Migrants whether local or international send remittances back to their families for different reasons. Some may remit for selfish reasons (in favour of themselves) while others will remit in favour of their family and friends they left behind. This leads to the two main approaches for analyzing remittances. The first is the "portfolio" approach while the second is the altruism approach (IMF, 2005, p.78). The portfolio approach sees remittances as a self interest controlled capital transfer to diversify the migrant's savings. Portfolio motives come out of investment opportunities and saving differentiation while the altruistic approach sees remittances as a transaction that benefits the receivers who were "left behind' by the migrant without any demand on the receiver from the remitter. Another theory of remittances has to do with informal loan repayment. Households support their own members especially the young and those in school. When the young grow up and when those in school complete their schooling they are expected to support others in order to repay the "debt". The "loans" are informal and society values and perceptions about those who do not honour their debts act to reinforce debtors honour their debts. Remittances in this case are perceived as an informal and implicit repayment to the family at large for costs taken before departure whether to a domestic or international destination (Poirine 1997).

The chain of family loan arrangement works in three steps: The first step is the preparation and costs for migration. These costs include the costs of bringing up and educating the migrant; the second step is when the migrant has migrated, then starts to repay the debt and saves for the future through remittances. The migrant's savings are used to prepare a new generation for migration; the third step concerns the new generation repaying their debt with remittances to the former migrant worker, currently retired at original residence. The loan taken before migration is informal or implicit so the interest rate and amount is not precisely agreed upon which makes the enforcement of repayment hard. Enforcement is done through social control, cultural values of family solidarity and loyalty, and threats of a loss of the family support at a later stage in life. If the sizes of remittances stay stable for a longer period of time, it indicates that there is a good enforcement of repayment (Poirine, 1997).

Altruistic motives have therefore been explained as either repayment of an old loan or some kind of aid to the receiver. Remittances are likely to affect the economy regardless of whether they are sent with the intentions of a portfolio investment or altruistic helpfulness. Capital for portfolio investment may increase the economic activity since investments are done with the intentions to generate profits and productivity, in the same manner as foreign direct investment does. Capital sent in the mind of altruistic helpfulness does not bring any demand for profits or productivity. Households are free to use the remittances as they deem fit. If altruism dominates remittances, it may be the case that the inflow will have smaller effect on the economic activity. The effect could even become negative depending on whether the capital makes the receiver less productive than the productivity the capital generates from being used. Another theory of remittances has to do with compensation capital for economic growth. The idea that remittances work as compensation capital for poor economic performance was supported by Chami et al (2005) who found negative correlation between the size of remittances and the home country's GDP for the period 1970-1998.

According to the authors, the negative relationship between remittances and economic growth is due to two main factors: moral hazard coupled with information asymmetry. The model assumes that recipients received remittances as an altruistic gesture. The recipient maximizes utility by selecting an optimal mix of his labour-leisure choice. Since remittances will accrue regardless of the recipients' labour efforts, they may choose more leisure and less work in order to maximize their utility. This decision could be a source of dependency syndrome associated with social transfer programmes. Recipients may not desire to work hard since they have remittances as a source of income to depend on. The model also assumes the presence of asymmetric information; the remitter cannot observe the receivers' work effort. As such the remitter continues to supply more and more income regardless of whether the recipients are put more efforts to work or not. As such there may be decreased productivity, and as such remittances may not necessarily spur development and economic growth. This argument could be generalized to other social transfer programmes which may induce perverse incentives by the recipients. The model however does not condemn remittances and social transfer programmes rather it cautions that these types of programmes are good for cushioning vulnerable households; who may or may not become more productive.

3.1 Methodology and Results

This section describes the data on remittances, financial development, and unemployment, as well as the control variables used in the regressions. The data series for remittances constructed in this study covers the 1977-2008 periods. The data represent an improvement over existing remittance series in several dimensions. The recent literature on financial development includes several indicators to proxy for the ability of financial intermediaries to identify profitable projects, monitor and control managers, ease risk management, and facilitate resource mobilization. Usually, scholars concentrate on credit to private firms and household from banks and nonbank financial intermediaries (Greenwood and Jovanovic, 1990) or access to loans (as in Banerjee and Newmann, 1993; Galor and Zeira, 1993). More generally, proxies for financial development can be classified into two broad categories: those relating to the banking sector and those relating to the stock market (see Levine, Loayza, and Beck, 2000; and King and Levine, 1993). In this study we use domestic credit provided by the banking sector to private sector GDP (CREDIT/GDP), which measures how much intermediation is performed by the banking system, including credit to the private sectors. The data for the definitions of the variables are obtained from the International Financial Statistics (IFS) of the International Monetary Fund, the World Development Indicators (WDI) of the World Bank and the central bank of Nigeria statistical bulletin.

For the regressions, the dependent variable is the migrants' remittance in constant dollars from the WDI. Our set of controls includes *Inflation*, measured as the annual percentage change in the consumption price index. *Openness* to international trade, defined as the ratio of the sum of exports plus imports of goods to total output. Unemployment and population growths are used as proxy of labour market situation. Debt-income ratio representing debt overhangs effect and nominal exchange rate. All variables are specified in natural logs. All variables except consumer price index and exchange rate are taken from the WDI dataset. The main purpose of this study is to examine the determinants of migrants' remittances in Nigeria for the period 1977 - 2009. Thus there is the need to specify a mathematical equation. Following Adenuga (2008), Mitrovic and Jovicic (2006) and Poola and Ruiz (2005), we present the following basic mathematical specifications of the migrants' remittances inflow function:

REM = f (RGDP, UN, PPG, OPN, CPI, FD, DYR, RIR, EXR)

Where REM migrants' remittances = RGDP =Real Gross Domestic Product (a proxy variable for economic growth), unemployment rate (proxy for labour market situation) UN =PPG = population growth openness (measured as ratio of exports plus imports to GDP) a proxy for globalization. OPN = real interest rate RIR = consumer price index (proxy inflation) CPI = financial deepening LFD =

 $LREM = \beta_0 + \beta_1 LRGDP + \beta_2 LUN + \beta_3 LPPG + \beta_4 LOPN + \beta_5 LCPI + \beta_6 LFD + \beta_7 LDYR + \beta_8 LEXR + U$

(1)

 $\beta_1 \geq \ 0, \ \beta_2 > < 0 \ , \ \ \beta_3 > \ 0, \ \beta_4 \geq 0, \ \beta_5 > < 0, \ \beta_6 \geq 0, \ \beta_7 < 0, \ \ \beta_8 > < 0,$ Where : Natural logarithm Where L

From preliminary ordinary least squares (OLS) regression calculations using the Eview 4.0 for windows econometrics software to PCs and annual data for the 1977-2009 periods, it was found that the partial regression coefficients of real interest rate (RIR) and inflation rate were not statistically significant and fluctuation in direction. These variables were therefore dropped from the equation. Although, while proxy by (CPI) the coefficient was surprisingly statistically significant with expected negative sign. The final econometric results are reported below, together with the standard diagnostic test results.

LREM = -211.61 + 16.48 LRGDP - 0.02 LUN + 0.062 LPPG - 0.01 LOPN										
	(-1.82)		(51.44)		(-1.08)	(1.02)	(-0.14)			
	- 0.14I	CP1 (-2.06)	+ 55.03	5 LFD (1.57		OYR + 0.06 LEX (-3.29)	$\mathbf{R} + \mathbf{E}$ (1.70)			
R-s	squared	=	0.99		Adjusted	R-squared	= 0.99			
See	e	=	0.05		F –stat	istics	= 5136.86			
Eq	Equation of Log-Likelihood				58.27					
Me	Mean of dependent variable				17.60					
Ak	Akaike information criterion				-3.08					
Scl	Schwarz Bayesian Criterion				-2.67					
D. '	D.W-Statistics			=	1.9					

where t ratios are reported in parenthesis below the coefficients. A plot of the actual and fitted series of LREM is given in fig 1. From the value of \mathbb{R}^2 , it can be concluded that the 8 stimuli in the equation explain 99% of the systematic variations in migrants' remittances inflows and 1% unexplained during the 1977 – 2008 period. The F value of 5136.85 is highly significant, easily passing the significant test at the 1% level. Thus, there is no doubt that there exists a significant linear relationship between migrants' remittances and the regresses used. However, except for Real Gross Domestic Product which passes the positive a priori test and significant test at the 5% level which shows over whelming evidence that the improvement in the gross domestic product is a positive factor in attracting migrants' remittances into Nigeria, inflation which has an expected negative sign and is significantly different from zero at the 5% level which thus, shows some evidence that uncertainty and instability proxy by consumer price index (CP1) also act to discourage migrant remittances and also the debt-income ratio which is significantly different zero at the 5% level with the expected negative signs. Thus it can be said that macro economic instability, as proxy by the occurrence of high debt-income ratio, has played a significant role in discouraging remittances inflows. Other variables like openness (OPN) which is a proxy for globalization is both a priori and statistically insignificant. This which supports the literature that the Nigeria economy is losing out as it experiences a worsening of existing imbalances and distortions in the global economy (Loto, 2006).

The unemployment variable though has the expected negative sign but statistically not different from zero at the 5% level. Thus, from the sign, it can be concluded that domestic labour market situation (especially unemployment level) is an important determinant of migrants' remittance in Nigeria. This supports Ravenstein's (1885 & 1889), Lee (1966) and Todaro (1969 & 1976) laws of migration which states that, migrants' move from areas of low opportunity to areas of high opportunity. This leads to the conclusion that more jobs in Nigeria would significantly affect remittances and therefore cause migration pressures, to decline. The positive sign of population growth is clear evidence that increases in the population growth rate is a positive factor in attracting migrants' remittances into Nigeria. However, statistical result shows that the population growth is not different from zero. The debt-income ratio is significantly different zero at the 5% level. The variable has the expected negative signs. Thus it can be said that macro economic instability, as proxy by the occurrence of high debtincome ratio, has played a significant role in disclosing remittances inflows.

Although financial deepening (FD) has the expected positive sign but is not statistically different from zero at 5% level. Thus, this shows that financial development does not promote migrant remittances during the period under study. The economic result of exchange rate is also constant with the production of economic theory, and it suggests that as exchange rate depreciates, remittances also rise. With one percent point depreciation in the normal exchange rate, it culminates in 6 percent basis point increase in remittances. This is in line with the view of Aydas, Neyapti and Metin-Ozean (2002).

In sum, a 1% rise in real GDP is expected to generate at least a 16.48% increase in migrants' remittances. The variables measuring macro economic instability have negative signs, confirming that an unstable macroeconomic policy environment will act to discourage migrants' remittances inflows into Nigeria.

4.1 Conclusion, Recommendation and Implication

Remittances have become a decisive element in the determination of the balance of payments, expenditure and economic growth for the countries of origin of emigrants to the USA, the EU, Japan and other countries, including within Latin America. This study therefore presented the results of an econometric study of the determinants of migrants' remittances in Nigeria using time-series data for the 1977-2009 periods. It was found that the main empirical determinants of migrants' remittances were real GDP, labour market situation proxied by unemployment rate and population growth. Inflation rate proxied by consumer price index, financial deepening, debt-income ratio and exchange rate. Real GDP, population growth, financial deepening and exchange rate exert a positive effect on migrants' remittances. The openness, which was used as a proxy for globalization surprisingly come out with a negative instead of a positive sign. Since the variable used as proxy for macroeconomic instability and uncertainty were shown to exert a negative influence in migrants' remittances, the empirical results validates the hypothesis that an unfavourable and unstable policy environment in Nigeria largely explains the low levels of migrants' remittances inflows in the past three decades.

Empirical finding in this study also imply that, improving financial market deepening, intermediation and preventing exchange rate misalignments would help to increase the flow of remittances. On the basis of the above analysis, migrants' will be more willing to send and invest if inflation is kept under control and exchange rate and financial conditions are reasonably stable.

The behaviour of remitters has been well covered by the literature within and outside the region, with significant contributions by The Inter-American Dialogue, the IDB, and a number of other Academic and International Organizations. Among the different conclusions about how individuals act regarding these remittances, one of great policy significance is that these are voluntary transfers among individuals, and thus are better left alone, without compulsory official intervention to channel these flows to alternative uses. Public actions as well as that of financial intermediaries have helped increase competition, reduce costs, improve transparency, and allow for recipients to save in the financial system. Even efforts oriented at benefiting communities, as opposed to individuals, have been treated carefully by the authorities. Otherwise the reaction by individuals would have been swift- the remitters would have sought to send their money through alternative means that could be less efficient but not subject to government control. Alternative plans would most likely end up in a drying out of these flows, at least through open channels. The macroeconomic impact of remittances does not provide a major scope for intervention regarding the flows, although as these remitted amounts increase, they have a clear effect on the economic performance of the country.

Our results at this stage convey a cautiousness message, only explaining the patterns in the observed behaviour of remittances and other inflows, required further empirical examinations. The objective of this study was to simply provide evidence on the core determinants of migrants' remittances. however, it could be argued that there might be a problem with our conclusion, been drawn solely based on the examination of formal remittances flow , while informal channels are estimated by the researchers to still attract about 50% of remittances Ratha, (2006). However, all studies dealing with remittances only use official remittances data because of lack of data on informal remittances. Consequently, the cyclical behaviour of formal remittances cannot be ascertained, and neither is it possible to know the impact of informal remittances on our findings. This lack of data obviously plagues the findings of all remittances studies.

As a final note, whether migrants' remittances flows are countercyclical and stabilizing or not, their impact depends on their importance relative to GDP and their sources inflows. However, even though migrants' remittances may be small as a share of GDP, it may amount to a large share of the income of recipient households and may therefore have substantial impact on the ability of these households' income. These considerations should not be seen as final. Clearly, further efforts are needed to analyze the effect of remittances on the Nigerian economy and developing economies in general. However, the observations coming from this study give a good indication of where to put the emphasis both with regard to future research and policy actions.

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Appendix 1



Appendix 2

This is the regression result

Dependent Variable: LREM Method: Least Squares Date: 07/22/10 Time: 07:03 Sample: 1977 2008 Included observations: 32

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	-211.6125	116.2757	-1.819921	0.0818
LRGDP	16.47663	0.320315	51.43878	0.0000
LUN	-0.026069	0.024157	-1.079121	0.2917
LPPG	0.617043	0.607928	1.014994	0.3207
LOPN	-0.010788	0.076639	-0.140769	0.8893
LCPI	-0.139042	0.067495	-2.060034	0.0509
LFD	55.03274	34.97607	1.573440	0.1293
LDYR	-0.069916	0.021244	-3.291105	0.0032
LEXR	0.061758	0.036242	1.704064	0.1018
R-squared	0.999441	Mean dependent var		17.60406
Adjusted R-squared	0.999246	S.D. dependent	1.682820	
S.E. of regression	0.046207	Akaike info cri	-3.079132	
Sum squared resid	0.049106	Schwarz criterion		-2.666894
Log likelihood	58.26611	F-statistic		5136.849
Durbin-Watson stat	1.582902	Prob(F-statistic	0.000000	