ANALYSIS OF THE RELATIONSHIP BETWEEN REMITTANCES AND MONETARY POLICY ON ECONOMIC GROWTH IN NIGERIA

ALI SALISU
Department of Economics, Faculty of Social Sciences, Bayero University, Kano.
alisalisubeto@gmail.com; 08068978846

ADAHAMA IBRAHIM HALADU
Department of Economics, Faculty of Social Sciences, Bayero University, Kano
adahamahaladu@gmail.com; 08063509665

ABSTRACT
Remittances has become a significant source of foreign currency to the people or a nation at large especially in Africa and developing countries. The paper examines the shocks effect of Remittances and monetary policy on Economic Growth in Nigeria using quartly data from 2010Q1 to 2021Q4. The study employed Structural Vector Autoregressive (SVAR) model. The Zivot and Andrew unit root test indicates that variables such as gross domestic product, remittances, and monetary policy rate are integrated of order one while real exchange rate and money supply are integrated of order zero. The results from the impulse response functions revealed that, the shock effect of real exchange rate to gross domestic product shock is negative, money supply transmit positive effect on gross domestic product in Nigeria, monetary policy rate transmit positive shock to gross domestic product in Nigeria, remittances transmit negative shocks to gross domestic product in Nigeria. The Granger causality test shows bi-directional causality of real exchange rate, money supply, monetary policy rate and remittances on gross domestic product in Nigeria. Furthermore, the study shows that monetary policy has a positive effect on economic growth in Nigeria while a remittance has a negative effect on economic growth in Nigeria. The paper recommends that monetary authority (Monetary Policy Committee) should increase monetary policy rate to manageable rate as higher monetary policy rate increases gross domestic product in Nigeria. Government should bring many ways to increase remittances an inflow to the country due to its significance in influencing economic growth.
Keywords: Remittances, Monetary policy, Economic growth

JEL Classification: F24, E52**,** O40

1 INTRODUCTION

Remittances has become a significant source of foreign currency to the people or a nation at large especially in Africa and developing economies. According to the World Bank, remittances pave ways to individual with the ability to meet basic needs of life like food, shelter and healthcare. This idea got empirical support as studies have also indicated that remittances minimize poverty and inequality in low and middle-income countries (Akobeng 2015). Remittances means transfers of money, goods and diverse traits by migrants or migrant groups back to their home countries. Although nowadays, the idea of remittances constitutes only monetary aspect, remittances include both monetary and non-monetary flows, including social remittances (Alechenu, 2021). According to the IMF (1999), remittances make up of goods or financial instruments transferred by people living and working abroad to their home economies. Calculations of remittances are confined to

transfers made by workers that have lived in foreign economies for at least one year and remove transfers from migrants that are self-employed. In 2018, remittance flows to developing nations was estimated at $350 billion, this value is much higher than the total foreign direct investment, portfolio investment, as well foreign aid inflows. In 2019, Nigeria registered an inflow of US$25 billion remittance from Nigerians in the Diaspora. This amount constituted more than 80 per cent of the nation's annual budget and represents about 6 per cent of the Gross Domestic Product. In 2018, about US$23.63 billion remittance inflow was received in Nigeria. This sum represents 6.1 percent of Nigeria's GDP Nevin and Omosomi (2020). The concept monetary policy has been defined by economists from different perspectives. According to CBN (2008), monetary policy was defined as "Any policy measure set by the federal government through the CBN to manage the cost availability and supply of credit. It also referred to as the controlling of money supply and interest rate by the CBN in order to manage inflation and to stabilize the currency flow in an economy. The main objective of monetary policy in Nigeria is to make sure price and monetary stability. This is only achieved by causing savers to avail investors of surplus funds for investment through appropriate interest rate structures; stemming wide fluctuations in the exchange rate of the naira: proper supervision of banks and related institutions to ensure financial sector soundness; maintenance of efficient payments system; applying deliberate policies to expand the scope of the financial system so that interior economies, which are largely informal, are financially included. Financial stability, through sound monetary policy, will attract remittances especially in the form of savings while the provision of products targeted at recipients, like remittance bonds and foreign currency accounts will help to pool remittances for planned investment for development. Remittances form a significant portion of total foreign inflows into the Nigerian economy. Between 1997 and 2006 the ratio of remittances to total GDP averaged 2.76. This ratio surpassed the contribution of foreign direct investment and portfolio investments put together in the comparable period (Mbutor, 2010). The link between monetary policy and remittances is invariant with respect to any operating framework. Remittance flows associated with monetary policy through interest rate structure, exchange rate management, financial stability, efficiency of payments system, general economic stability, as examined by inflation and of course, the degree of independence of policy actions from global economic realities. Existing economic conditions in the host country are exogenous. Starting from a point of exchange rate stability, an appreciation or depreciation of the receiving country's currency will have diverse effects depending on the motive for the remittances. The value of local consumption per dollar will raise following currency depreciation in the receiving country such that remitters for family support might cut back on amounts remitted while keeping receiving-family welfare static. An appreciation produces the reverse effect (Mbutor, 2010). Most of the literatures reviewed do not paid attention to the monetary policy rate as proxy to monetary policy variable in their analysis which is very important except Oluwaseun (2021) and Ebenezer et al (2019), in relation to the methodology none of the study employed Structural Vector Autoregressive (SVAR) model except Salisu et al (2022). In view of the above this paper considered monetary policy rate and employed Structural Vector Autoregressive (SVAR) model in the analysis. However, the main objective of the paper is to examine the shocks effect of Remittances and monetary policy on Economic Growth in Nigeria. The other part of the paper include literature reviewed which is the second part of the paper, third part paper presented the methodology, part four is the presentation and analysis of the results and lastly part five which is the conclusions and recommendations.

2 LITERATURE REVIEW

2.1 Theoretical Literature
The self-interest motive, as its name implies, claims that migrants transfer money to their home country's households for personal gain. The desire of a migrant to return to his or her home country could be one factor for the self-interest motive. Migrants remit because they can't or won't invest in their host nation, according to the self-interest theory of remittances. As a result, "one obvious area to invest, at least a portion of his riches, is in his native country by purchasing property, land, financial assets, and other such assets." These assets may earn a higher rate of return than assets in the host country although their risk profile can also be greater. Lucas and Stark (1985) mentioned that when emigrants intend to return to their home country, they would send more remittances to ensure that their social assets, that is, relationships with family and friends are intact. The self-interest theory of remittances posits that migrants remit when they do not find investment opportunities in their host country or are unwilling to invest. Thus, "an obvious place to invest, at least part of his assets, is in the home country by buying property, land, financial assets, and so on. These assets may earn a higher rate of return than assets in the host country although their risk profile can also be greater. In turn, the family can administer, during the emigration period, those assets for the migrant, thus acting as a trusted agent Addison (2004)."

2.2 Empirical Literatures

A number of studies in the literature have examined the impact of remittances on economic growth and the effects of monetary policy on economic growth in Nigeria and other countries in the world, but used different variables and methodologies in the analysis and achieved different results among them are; Salisu, Haladu and Suwaid (2022) examined the impact of remittances shocks on economic growth in Nigeria in the midst of Covid-19 using monthly data. The study used the following variables in the model such as real gross domestic product, remittances, foreign direct investment and exchange rate and employed Structural Vector Autoregressive (SVAR) model in the analysis. The finding in the study indicated that the shock of remittances on real gross domestic product was found to be positive. Exchange rate has a negative effect on real gross domestic product in Nigeria. Foreign direct investment has a negative effect on real gross domestic product in Nigeria. The impulse response function shows that, the shock of remittances to real GDP in the midst of to Covid-19 pandemic has impacted positively. Aliu and Ogbeide-Osaretin (2022) used Random effect and generalized Method of Moment to examine the migration and remittance its implication for economic development in Africa. Finding in the study showed that remittance has a negative impact on economic development while migration had a positive impact on economic development. Another study by Oluwaseun (2021) found that monetary policy rate, Interest rate, money supply and Investment to productive sector have positive impact on economic growth in Nigeria while real exchange rate has a negative impact on economic growth in Nigeria. The study recommends that government and relevant monetary authorities should make financial sector less volatile and ensure the effective monitoring of money supply levels, among others. In the work of Ukashatu et al (2020) examined the impact of remittances on economic growth in some selected Sub-Saharan African countries such as Nigeria, Ghana, Kenya and Senegal using Pool Mean Group (PMG). The result shows an insignificant negative effect of remittances on economic growth in the selected Sub-Saharan African countries. The study recommends that Sub-Saharan African countries to design policies as well as the institutional reform that can encourage the productive use of remittances. Another study of remittances on economic growth by John, Urok

and Udoka (2020) examined the signification of diaspora remittances, and to suggest measures that could enhance its effectiveness and economic growth in Nigeria. The finding in the study revealed that there was a significant relationship between total remittances and gross domestic product in Nigeria. Furthermore, workers remittance has an insignificant effect on gross domestic product in Nigeria. Omonzejie and Madueme (2020) investigated the effect of financial deepening on manufacturing sector output in Nigeria using Autoregressive Distributed Lag (ARDL) technique. The results obtained show a positive but insignificant relationship between the manufacturing sector output and the total number of banks, the ratio of the broad money supply to GDP and the ratio of market capitalization to GDP both in the long run and the short run. Anthony-Orji, Orji, Ogbuabor, and Onoh, (2019) assessed the impact of monetary policy shocks on financial inclusion in Nigeria using the Vector Autoregressive Model (VAR). Financial inclusion, interest rate, money supply, and deposit rates of bank deposit are the variables in the model. The results revealed that shocks to minimum rediscount rate, interest rate, broad money supply and deposit rates of deposit banks all have significant impact on financial inclusion in Nigeria. The study recommends that the financial authorities should adopt effective monetary policy measures that will increase financial inclusion in the economy. Sebastine, Nnamdi, Uche and Uche (2019) Used logistic based regression to ascertain the distribution of emigrants' remittance over the level of human capital development in education. Finding shows that human capital development level in education completed before migration also contributes to the unequal distribution of remittance across the emigrating groups. The study recommends that advancement in human capital development in education before migration would reduce the inequality in remittance inflow. In the work of Ebenezer, Joshua, Kofi and Agyapomaa (2019) examined the changes and bi-causal link between monetary policy and financial inclusion in sub-Saharan Africa using panel data. Variables used in the study include monetary policy rate, automated teller machine, commercial bank branch, commercial bank account, Borrowers from commercial banks, depositors from commercial bank, inflation exchange rate and GDP and employed Panel VAR. The findings in the study suggest a two way causal relationship between monetary policy and financial inclusion. Specifically, it is evident that monetary policy affects financial inclusion, and financial inclusion is also affected monetary policy. Ngozi (2019) investigates the effectiveness of a mix of key policy instruments namely interest rate, cash reserve requirement, government expenditure, taxation and public sector borrowing on economic growth and found that interest rate positively effect on monetary policy, tax proxy was found to be positive relation with national output, recurrent and capital spending showed mixed results with seemingly neutralizing effect. Also Brownbridge et al (2017) examined the strength of the impulse response of inflation to the monetary policy variable using consumer price index (CPI), nominal exchange rate, nominal gross domestic product (GDP) and the policy interest rate as variables in the analysis. The study employed panel vector error correction (PVEC) methodology and panel vector auto-regressions (PVARs). The results show that countries with higher levels of financial inclusion exhibit stronger impulse responses, although this does not necessarily means that higher levels of financial inclusion are the cause of stronger monetary transmission mechanisms as the degree of financial inclusion may be associated with other aspects of development which also influence the monetary transmission mechanism. Nnenna, Ihemeje, and Anumadu (2016) showed that Central Bank Nigeria Monetary Policy measures are effective in controlling both the monetary and real sector aggregates such as employment, prices, level of output and the rate of economic growth. The result indicated that average price and labour force have significant effect on Gross Domestic Product while money supply was not significant. Interest rate has a negative and statistically significant. Matuzeveviciute and Butkas (2016) employed unbalanced panel data for 116 countries over the period of 1990 to 2014, examined the

connection between remittance and the level of economic development as well as its impact on long run economic growth. The study adopted OLS, fixed effect model and found that remittance have a positive impact on long run economic growth, but the impact differs based on the country's economic development level and the availability of remittance in the country. Salahuddin and Gow (2015) assessed the relationship between migrant remittance and economic growth using panel data from 1977 to 2012 for Bangladesh, India, Pakistan and the Philippines. This paper used a cross sectional dependence test, CIPS panel unit root test, panel Pedroni and Western Lund co-integration tests and used the PMG technique. The result indicates that there is a highly significant long-run positive relationship between remittance and economic growth in the selected countries. Aboulezz (2015) employed ARDL techniques to determine the effect of international remittance on economic growth in Kenya for the annual time series data from 1993 to 2014. The result indicates that the international remittance indicators are significant factors influencing the economic growth in Kenya and concluded that economic growth in Kenya has largely driven by international remittances. Osigwe and Madichie (2015) investigated the relationship and causality that exist between remittance inflows and monetary aggregates, interest rate, exchange rate, and the domestic price level in Nigeria. The Granger causality test revealed a one way causality running from money supply to remittances, causality run from exchange rate to remittances and not in reverse direction. Unidirectional causality run from interest rate to remittances, there was no evidence of causality in any direction between inflation rate and remittances, the study also found that causality run from exchange rate to money supply. Celina (2014) assessed the impact of various monetary policy instruments such as money supply, interest rate, exchange rate and liquidity ratio in augmenting economic growth of Nigeria. The result showed that only exchange rate indicated significant impact on economic growth in Nigeria while other variables did not. The study concluded that monetary policy did not impact significantly on economic growth of Nigeria within the period under review. Ukeje and Obiechina (2013) showed that workers' remittances is significant and has positive effects on economic growth in Nigeria in both short-run and long-run using error correction methodology (ECM). The study recommends the need to provide adequate infrastructure for attracting more remittances into the economy through formal financial sector channel as well as measures encouraging the recipients to channel such into productive sector or through domestic savings that would boost investment and economic growth, rather than enmeshed in non-productive activities.

2.3 Literature Gap and Value addition

Most of the literatures reviewed do not paid attention to the monetary policy rate as proxy to monetary policy variable in their analysis which is very important except Oluwaseun (2021) and Ebenezer et al (2019), in relation to the methodology none of the study employed Structural Vector Autoregressive (SVAR) model except Salisu et al (2022). In view of the above this paper considered monetary policy rate and employed Structural Vector Autoregressive (SVAR) model in the analysis.

3 METHODOLOGY
3.1 Theoretical framework
The current study employs the Harrod-Domar growth model's saving-investment theoretical gap paradigm, as popularized by Chenery and Strout (1966) and adopted by Aliu et al (2022). It assumes that developing nations may reach equilibrium in their saving-investment imbalance by utilizing external inflows of capital, including remittances. Using the two-gap approach, we can see that at all times, saving equals investment:

$$S_t + I_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (3.1)$$

But, in real life, real saving is often less than investment in African countries (saving gap) hence, remittances can perform as external funds that be used to add up to the low level of saving, thus investment is given as:

$$S_t + remitt = I_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.(3.2)$$

The stock of capital stock equation with capital stock being a function of saving is thus investment is given as given as:

$$K_t = S_t + remitt + (1 - \delta)K_{t-1} \dots\dots\dots..\dots\dots\dots\dots\dots\dots\dots.(3.3)$$

Applying the Cobb- Douglas production function, we have:

$$Y_t = AL_t^{1-\alpha}K_t^{\alpha} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots..(3.4)$$

Where Y_t = the gross domestic product (GDP);
L_t = labour
K_t = the capital stock.

The model of the study is adopted from the work of Oluwaseun (2021), it can be shown as

$$GDP = F(MPR, INTR, MS, IPP) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots... (3.5)$$

The model is modified as:

$$RGDP = F(REM, MPR, REXRATE, MS) \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.\dots (3.6)$$

Where the real Gross Domestic Product (RGDP) is used as a proxy that measured economic growth, REM is the remittances measured as personal remittances received per current US dollar, MPR is monetary policy rate measured as monetary policy committee giving rate, REXRATE is the official exchange rate is measured as real exchange rate, MS is the money supply measured as percentage to GDP.

3.1 Structural Vector Autoregressive (SVAR) Model

In order to achieve the objective of the current study, the study employed structural VAR which would determine the impact of shocks of remittances and monetary policy on economic growth in Nigeria and ascertain which transmit the highest shocks to economic growth. The main objective of VAR analysis is to ascertain the interrelationship among the variables employed not to determine the parameters estimates Enders (20015). VAR is a system of equations which shows every variable in the system to be a function of its own lags and lags of the remaining variables in the system. Thus, it treats all variables to be potentially endogenous. VAR is an econometrics tool that shows the dynamic interrelationship between stationary variables. VAR is a model which consists only of endogenous variables and allows for the variables to depend not only on its own lags Enders (2015).

The structural VAR model is represented by the following system of equations:

$$REXRATE_t = \alpha_{10} - \alpha_{20} MS - \alpha_{30} MPR_t - \alpha_{40} REM_t - \alpha_{50} RGDP_t + \sum_{t-1}^{p} \beta_{10}^t REXRATE_{t-1} + \beta_{10}^t MS_{t-1} + \beta_{12}^t MPR_{t-1} + \beta_{13}^t REM_{t-1} + \beta_{14}^t RGDP_{t-1} + \mu_t^{EXRATE} \dots\dots\dots\dots\dots\dots..\dots (3.7)$$

$$MS = \alpha_{10} - \alpha_{20} REXRATE - \alpha_{30} MPR_t - \alpha_{40} REM_t - \alpha_{50} RGDP_t + \sum_{t-1}^{p} \beta_{10}^t MS_{t-1} + \beta_{10}^t REXRATE_{t-1} + \beta_{12}^t MPR_{t-1} + \beta_{13}^t REM_{t-1} + \beta_{14}^t RGDP_{t-1} + \mu_t^{MS} \dots\dots\dots\dots\dots\dots (3.8)$$

$$MPR_t = \alpha_{10} - REXRATE - \alpha_{30} MS_t - \alpha_{40} REM_t - \alpha_{50} RGDP_t + \sum_{t-1}^{p} \beta_{10}^t MPR_{t-1} + \beta_{10}^t REXRATE_{t-1} + \beta_{12}^t MS_{t-1} + \beta_{13}^t REM_{t-1} + \beta_{14}^t RGDP_{t-1} + \mu_t^{MPR} \dots\dots\dots\dots\dots\dots (3.9)$$

$$REM_t = \alpha_{10} - \alpha_{20}\,REXRATE - \alpha_{30}\,MS_t - \alpha_{40}\,MPR - \alpha_{50}\,RGDP_t + \sum_{t-1}^{p}\beta_{10}^{t}\,REM_{t-1} + \beta_{10}^{t}\,REXRATE_{t-1} + \beta_{12}^{t}\,MS_{t-1} + \beta_{13}^{t}\,MPR_{t-1} + \beta_{14}^{t}\,RGDP_{t-1} + \mu_t^{REM} \dots\dots\dots\dots\dots\dots (3.10)$$

$$RGDP_t = \alpha_{10} - \alpha_{20}\,REXRATE - \alpha_{30}\,MS_t - \alpha_{40}\,MPR_t - \alpha_{50}\,REM_t + \sum_{t-1}^{p}\beta_{10}^{t}\,RGDP_{t-1} + \beta_{10}^{t}\,REXRATE_{t-1} + \beta_{12}^{t}\,MS_{t-1} + \beta_{13}^{t}\,MPR_{t-1} + \beta_{14}^{t}\,REM_{t-1} + \mu_t^{RGDP} \dots\dots\dots\dots\dots (3.11)$$

$$\begin{bmatrix} REXRATE \\ MS \\ MPR \\ REM \\ RGDP \end{bmatrix} = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \end{bmatrix} \begin{bmatrix} 1 & A_{12} & A_{13} & A_{14} & A_{15} \\ A_{21} & 1 & A_{23} & A_{24} & A_{25} \\ A_{31} & A_{32} & 1 & A_{34} & A_{35} \\ A_{41} & A_{42} & A_{43} & 1 & A_{45} \\ A_{51} & A_{52} & A_{53} & A_{54} & 1 \end{bmatrix} \begin{bmatrix} REXRATE_{t-1} \\ MS_{t-1} \\ MPR_{t-1} \\ REM_{t-1} \\ REM_{t-1} \end{bmatrix} + \begin{bmatrix} 1 & 0 & a_{13} & a_{14} & 0 \\ 0 & 1 & a_{23} & a_{24} & 0 \\ a_{31} & a_{32} & 1 & a_{34} & a_{35} \\ a_{41} & 0 & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \begin{bmatrix} U_t^{REXRATE} \\ U_t^{MS} \\ U_t^{MPR} \\ U_t^{REM} \\ U_t^{RGDP} \end{bmatrix}$$

Where $A = \begin{bmatrix} 1 & A_{12} & A_{13} & A_{14} & A_{15} \\ A_{21} & 1 & A_{23} & A_{24} & A_{25} \\ A_{31} & A_{32} & 1 & A_{34} & A_{35} \\ A_{41} & A_{42} & A_{43} & 1 & A_{45} \\ A_{51} & A_{52} & A_{53} & A_{54} & 1 \end{bmatrix}$, $C = \begin{bmatrix} C_1 \\ C_2 \\ C_3 \\ C_4 \\ C_5 \end{bmatrix}$, $Z = \begin{bmatrix} REXRATE \\ MS \\ MPR \\ REM \\ RGDP \end{bmatrix}$, $Z_{t-1} = \begin{bmatrix} REXRATE_{t-1} \\ MS_{t-1} \\ MPR_{t-1} \\ REM_{t-1} \\ REM_{t-1} \end{bmatrix}$, $U_{t-1} =$

$\begin{bmatrix} U_t^{REXRATE} \\ U_t^{MS} \\ U_t^{MPR} \\ U_t^{REM} \\ U_t^{RGDP} \end{bmatrix}$ and $a = \begin{bmatrix} a_{11} & a_{12} & a_{13} & a_{14} & a_{15} \\ a_{21} & a_{22} & a_{23} & a_{24} & a_{26} \\ a_{31} & a_{32} & a_{33} & a_{34} & a_{35} \\ a_{41} & a_{42} & a_{43} & a_{44} & a_{45} \\ a_{51} & a_{52} & a_{53} & a_{54} & a_{46} \end{bmatrix}$ such that $U_t \sim$ iid $(0, a^2)$

z_t is a 5 × 1 vector of dependent variables; Z_t is a 5 × 1 vector of lagged variables; A is a 5 × 5 matrix of the parameters to be estimated and identified with 1 as a diagonal elements, C is a 5 × 1 vector of constants, a is a 5 × 5 matrix of the coefficients of lagged variables and μ_t is a 5 × 1 vector of the structural/ orthogonal zed errors which are assumed to be serially uncorrelated with a mean of zero and a constant variance.

4. EMPIRICAL RESULTS AND DISCUSSION

4.1 Descriptive statistics
Table 4.1 Descriptive statistics

Statistics	GDP	REM	MPR	REXRATE	MS
Mean	4.3927	3.7060	11.859	81.796	1.9093
Median	4.3903	3.7076	12.000	78.630	1.8955
Std. Dev.	0.1509	0.0556	2.3349	10.451	0.0547
Skewness	-0.0624	-0.9140	-1.4854	0.4114	0.2503
Kurtosis	2.0020	3.9853	4.2585	2.0527	1.9183
Jarque-Bera	1.9809	8.4453	20.387	3.0834	2.7820
Probability	0.3714	0.0146	0.0000	0.2140	0.2488
Observations	47	47	47	47	47

Source: Researcher computation using E-views 10.

Table 4.1 depicts the result of descriptive statistics of the study, it shows that the standard deviations of the variables of interest are not far away from their means except monetary policy rate and real exchange rate. The Skewness of the distribution indicates positive values and less than one of real exchange rate and money supply, this implies that the distribution has a long right

tail and normally distributed while gross domestic product and remittances shows negative values and less than one, this implies that the distribution has a long negative tail and normally distributed and lastly monetary policy rate indicates a value of greater than one, this means that this particular variable is not normal. The Kurtosis shows that all the variables employed are normally distributed because their values are not greater than 3, this means these variables normally distributed except monetary policy rate. The study also estimated Jarque-Bera test for normality. The distribution under the null hypothesis is that the series is not normally distributed. If probability value of Jarque-Bera statistics is greater than 0.05 we reject the null hypothesis and conclude that the variable is normally distributed. The result shows the rejection of null hypothesis of all the variables employed except remittances and monetary policy rate.

4.2 Zivot and Andrew Unit Root Test

The study employed Zivot and Andrew unit root test to confirm the order of integration among the variables of interest, because ignoring unit root test with break may lead the acceptance of null hypothesis where is supposed to be rejected.

Table 4.2 Zivot-Andrew Unit Root Test

| Variables	Level		First difference	
	Statistics	Break point	Statistics	Break point
LGDP	-4.1005	2015Q1	-5.3971**	2016Q3
LREM	-4.7245	2017Q2	-7.6671	2019Q3
MPR	-3.0251	2017Q4	-5.5581**	2016Q2
REXRATE	-6.5929**	2016Q3	-	-
LMS	-6.6043**	2016Q3	-	-

Source: Researcher computation using E-views 10.
*Asterisk**indicates stationary at 5% level of significance.*

Table 4.2 presets the Zivot and Andrew unit root test, the test shows that gross domestic product, remittances, and monetary policy rate are integrated of order one i.e. they became stationary after taking their first difference, the break dates are 2016Q3, 2019Q3, and 2016Q2 while real exchange rate and money supply are integrated of order zero i.e. they became stationary at level. Therefore, we can infer that there is mixture of order of integration among the variables employed for the period under study.

4.3 Impulse Response Functions (IRF)

Impulse Response Functions (IRFs) are tools of the unrestricted VAR approach for ascertaining the interaction among the variables in this study. They reflect how individual variables respond to shocks from other variables in the system. When graphically presented, the IFRs show a visual representation of the behavior of variables in response to shocks. The results can be shown in the figure **4.1** below:

Figure 1 Impulse Response Functions (IRF)
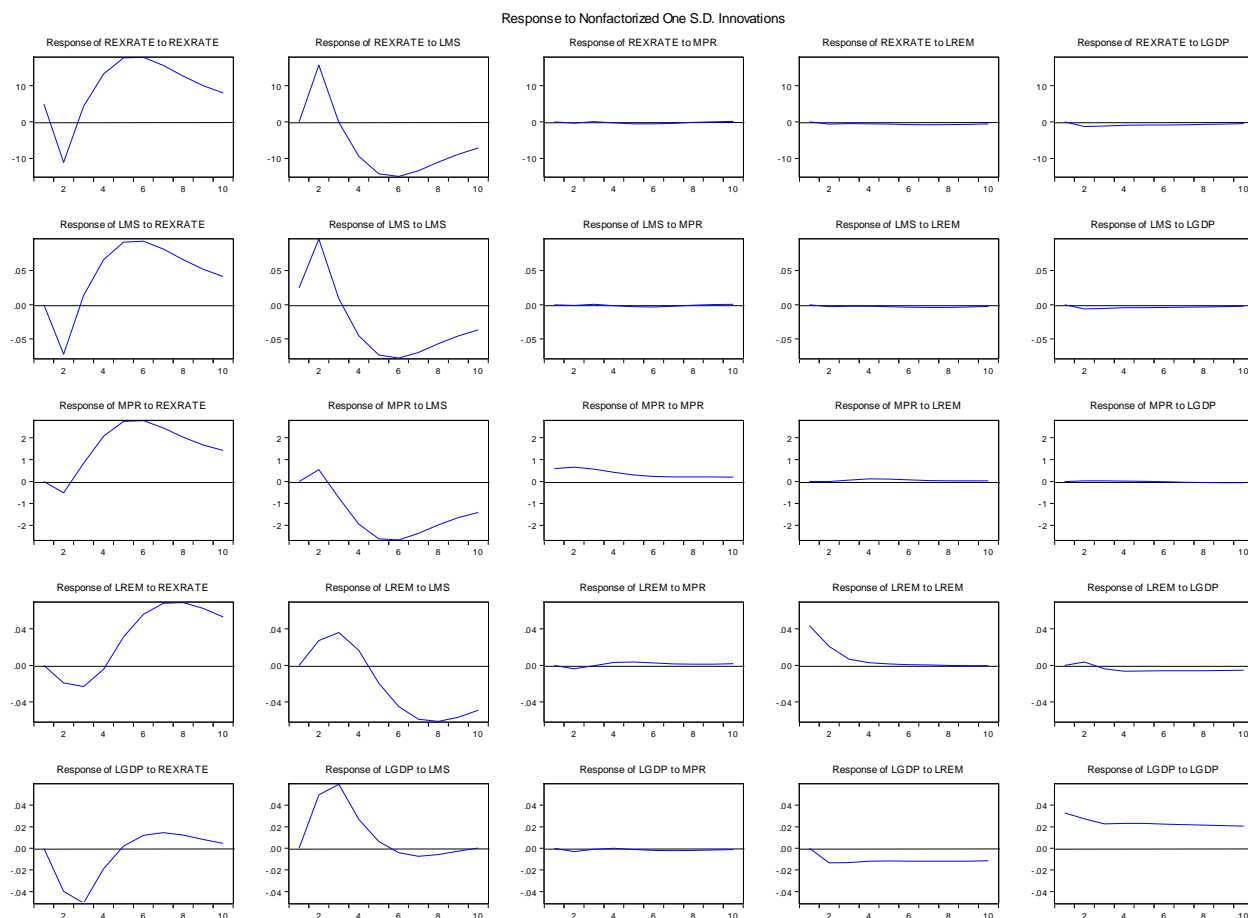
Source: Researcher computation using E-views 10.

Dynamic movements of each to one standard error shock to each other variables, especially to the gross domestic products (GDP) are examined by using orthogonalised impulse response functions (IFRs). There are five shocks such as; real exchange rate shock (shock 1), money supply (shock 2), monetary policy rate (shock 3), remittances (shock 4) and gross domestic product shock (shock 5). Each shock occurs over a 10 period time. The impulse response function presented above indicated that, one unit response of real exchange rate shock to its own is positive in period one, negative in period two and three and quickly change to positive up to period 10. The responses of real exchange rate to money supply is positive from period one to three and quickly change to negative up to period 10. The response of real exchange rate to monetary policy rate is positive throughout the horizon period. The shock of real exchange rate to remittances is positive throughout the horizon period. The shock effect of real exchange rate to gross domestic product shock is negative in period one to six and dies positively. The one unit response of money supply to real exchange rate shock is negative in period one to three and quickly changes to positive up to period 10. The shock of money supply to monetary policy rate is positive throughout the horizon period. The response of money supply to remittances is positive throughout the horizon period. The shock effect of money supply to gross domestic product shock is negative in period one to

four and quickly changes to positive till period 10. The one unit response of monetary policy rate to real exchange rate shock is negative in period one to two and quickly changes to positive up to period 10. The response of monetary policy rate to money supply is positive in period one to two and quickly changes to negative up to period 10. The response of monetary policy rate to remittances is positive throughout the horizon period. The shock effect of monetary policy rate to gross domestic product shock is positive throughout the horizon period. The one unit response of remittances to real exchange rate shock is negative in period one to four and quickly changes to positive up to period 10. The response of remittances to money supply is positive in period one to four and dies negatively. The response of remittances to monetary policy rate is positive throughout the horizon period. The shock effect of remittances to gross domestic product shock is negative in period one to three and dies negatively. The one unit response of gross domestic product to real exchange rate shock is negative in period one to five and quickly changes to positive up to period 10. The response of gross domestic product to money supply is positive in period one to five and dies negatively. The response of gross domestic product to monetary policy rate is positive throughout the horizon period. The response of gross domestic product to remittances is negative throughout the horizon period.

4.4 Variance Decomposition

The change of real exchange rate is always caused by 100 percent to itself in the first year. The fluctuation in real exchange rate in both the short-run and long-run are explained by its own shock, approximately 90 percent in the 3 period and only to fall to 80 percent in periods 10. The shock attributable to remittances is very minimal, able to explain only 9 percent of money supply variability in the long-run. Also in the long-run monetary policy rate is 1 percent, remittances is 5 percent and gross domestic product is 4 percent as a result of fluctuations in real exchange rate. Money supply in the short run explained itself by 98 percent in first period, in 3 periods is 4 percent and it continues to fall in long run to 9 percent. The shock attributable to gross domestic product is 3 percent in the short run and 3 percent in the long run. Monetary policy rate in the short run explained itself by 86 percent but it continues to only fall to 67 percent in the long run. The shock attributable to gross domestic product is 18 percent in the short run and 4 percent in the long run. Remittances in the short run explained itself by 95 percent but it continues to only fall to 59 percent in the long run. The shock attributable to gross domestic product is 8 percent in the short run and 5 percent in the long run. Gross domestic product in the short run explained itself by 83 percent but it continues to only fall to 88 percent in the long run.

4.5 SVAR Granger causality

The Structural VAR Granger causality test shows that real exchange rate granger cause gross domestic product and gross domestic product granger cause real exchange rate in Nigeria. Hence, the result detects a bi-directional causality running between real exchange rate and gross domestic product in Nigeria, this implies that real exchange rate can be used for the prediction of gross domestic product in Nigeria. Money supply granger cause gross domestic product and gross domestic product granger cause money supply, the result also indicates a bi-directional causality running between money supply and gross domestic product in Nigeria. Monetary policy rate granger cause gross domestic product and gross domestic product granger cause monetary policy rate. Hence, the result detects a bi-directional causality running between monetary policy rate and gross domestic product in Nigeria, by implication monetary policy rate can be used for the prediction of gross domestic product in Nigeria. Remittances granger cause gross domestic product

and gross domestic product granger cause remittances in Nigeria, the granger causality depicts a bi-directional causality between remittances and gross domestic product, this means that remittances can be used for the prediction of gross domestic product in Nigeria.

4.6 SVAR Stability Test

The Structural VAR stability test was employed to know whether all the Eigen values are less than one or all the moduli are lies inside the unit circle. The figure 2 shows that all the moduli lies inside the unit circle. This means that SVAR model is stable, it signifies that the impact of the shocks are finite and calculable. Hence, the Structural VAR condition is satisfies.

Figure 2 SVAR Stability Test

Inverse Roots of AR Characteristic Polynomial
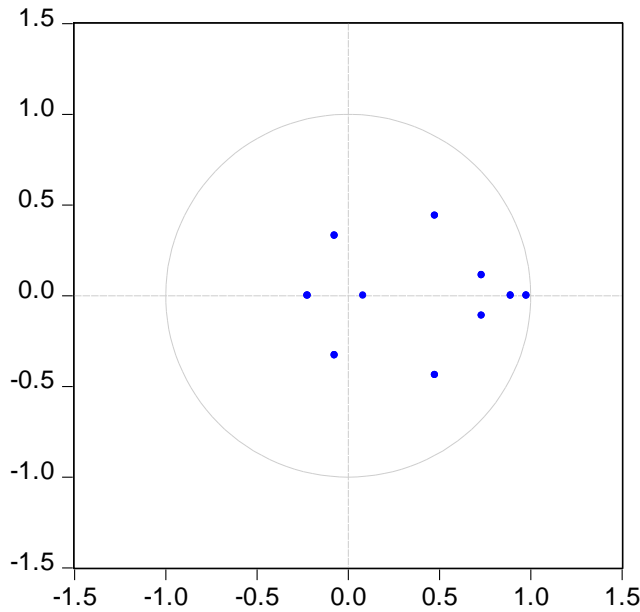
Source: Researcher computation using E-views 10.

4.7 Post estimation Test

The post estimation test is conducted to check the consistency and reliability of the estimated coefficients used in the model. The tests are; Serial Correlation, Heteroscedasticity and normality test.

Table 4.3 post estimation test

Residual serial correlation LM tests		
Lags	LM-Stat	Prob
1	37.00515	0.0677
2	36.98724	0.0679
3	20.36961	0.7272
Residual heteroscedaticity tests		
Chi-square	Df	
341.5157	285	0.0921

Residual Normality tests		
Jarque-Bera	Df	
491.6510	10	0.0000

Source: Researcher computation using E-views 10.

From table 4.3, it shows that the model is free from serial correlation and Hetroskedasticity because their p-values are greater than 5% while Normality test indicates that we cannot reject the null hypothesis because its p-value is less than 5%.

4.8 Discussion of the results

The result indicated that real exchange rate has a negative shocks effect on gross domestic product in Nigeria, this implies that an increase in real exchange rate will bring about a decrease in gross domestic product in Nigeria for the period under study, the negative findings concurred with the findings of Salisu et al (2022) and Oluwaseun (2021). Money supply transmits positive shocks effect on gross domestic product in Nigeria, this implies that an increase in money supply will cause an increase in gross domestic product in Nigeria, this is in line with the finding of Oluwaseun (2021). Monetary policy rate has a positive shocks effect on gross domestic product in Nigeria, by implication an increase in monetary policy rate will cause an increase in gross domestic product in Nigeria, this counter the finding of Oluwaseun (2021). Remittances transmit negative shocks to gross domestic product in Nigeria, this means that an increase in remittances will cause a decrease in gross domestic product in Nigeria for the period under study, this counter the economic apriori expectation that established a positive relationship between remittances and gross domestic product in Nigeria. The negative finding also counters the findings of Salisu et al (2022), Matuzeveviciute and Butkas (2016) and Salahuddin and Gow (2015) while similar with the finding of Ukashatu et al (2020). Furthermore, the study shows that monetary policy has a positive effect on economic growth in Nigeria while a remittance has a negative effect on economic growth in Nigeria.

5. CONCLUSIONS AND RECOMMENDATIONS

The paper investigates the shocks effect of remittances and monetary policy on Economic Growth in Nigeria using quartly data from 2010q1 to 2021q4. The results from the impulse response functions indicated that, the shock effect of real exchange rate to gross domestic product shock is negative for the period under study, money supply transmit positive effect on gross domestic product in Nigeria, monetary policy rate transmit positive shock to gross domestic product in Nigeria, remittances transmit negative shocks to gross domestic product in Nigeria. The paper recommends that monetary authority (Monetary Policy Committee) should increase monetary policy rate to manageable rate as higher monetary policy rate increases gross domestic product in Nigeria. Central bank of Nigeria should control the exchange rate in the country and keep watch dogs to block any leakage in the forex market. Government should bring many ways to increase remittances inflow to the country due to its significance in influencing economic growth.

References

Aboulezz, N. (2015). Remittances and Economic Growth Nexus: Empirical Evidence from Kenya. *International Journal of Academic Research in Business and Social Science*. 5(12), DOI:10.6007/IJARBSS/V5-i12/1958.

Addison, E. K. Y. (2004). The Impact of Macroeconomic Remittances in Ghana, Bank of Ghana; Bank of Ghana.

Akobeng, E. (2015). Out of inequality and poverty: evidence for the effectiveness of remittances in Sub- Saharan Africa. Quart Rev Econ Finance, 60, 207–223. https:// doi. org/ 10. 1016/j. qref. 2015. 10. 008.

Alechenu, B. E. (2021). Economic Impact of Diaspora Remittance on Nigerian Economy. *London Journal of Social Sciences,* 1(1), 80 – 87.

Aliu, T. I., and Ogbeide-Osaretin, E. N. (2022). Migration and remittance: implication for economic development in Africa. *Journal of Economics and Allied Research*, 7(2), 131 – 145.

Amuedo-Dorantes C, and Pozo S. (2004). "Workers Remittances and the Real Exchange Rtae: A Paradox of Gifts" World Dev., 32(8).

Anthony-Orji, O. I., Orji, A., Ogbuabor, J. E. and Onoh, J. E. (2019). Financial Inclusion and Monetary Policy Shocks Nexus in Nigeria: A New Empirical Evidence. *Journal of Academic Research in Economics,* 11(2), 364 – 388.

Balogun, E. (2007). Monetary policy and economic performance of West African monetary zone countries. *Munich Personal RePEc Archive (MPRA)* paper no 3408.

Brownbridge, M., Bwire, T., Rubatsimbira, D. and Grace A. T. (2017). The Impact of Financial Inclusion on the Interest Rate Channel of the Monetary Policy Transmission Mechanism.Working Paper No. 05.

CBN (2008). Central Bank of Nigeria (CBN), *Monetary Policy Department Series 1,* 2008.CBN/MPD/Series/01/2008. www.cbn

Celina, C. C. (2014). Monetary Policy and Economic Growth in Nigeria. *Journal of Policy and Development Studies,* 9(1), 234 – 247.

Ebenezer B. A., Joshua Y. A., Kofi A. O. and Agyapomaa, G. (2019). Monetary Policy and Financial Inclusion in Sub-Sahara Africa: A Panel VAR Approach, *Journal of African Business,* 1-24.

Elbadawi J. and Rocha R. (1992)."Determinants of Expatriate Workers' Remittances in North Africa and Europe, Working Paper 1038, Country Economics Department, World Bank.

Elsakka, M. I. T. (1998). "Migrant Workers' Remittances and Macroeconomic Policy in Jordan, Dept. Econ., Kuwait Univ.

Enders, W (2015). Applied econometrics time series, fourth edition. John Willey and sons.

Friedman, M. (1972). Have Monetary Policies Failed? *American Economic Review*, *Papers and Proceedings*, 62(2), 11-18.

Jhingan, M. L. (2009). *Principles of economics* (3rd ed). Vrinda Publications (P), Ltd.

John, J. I., Urok, A. B. and Udoka, C. O. (2020). Migrant Remittances and Economic Growth: The Nigerian Perspective. *International Journal of Scientific Engineering and Science,* 4(1), 52-57.

Khabo, V. S. (2002). *The Impact of monetary policy on economic growth of a Small and open economy: The case of South Africa.* Department of Economics, University of Pretoria.

Lucas, R. E. B., and Stark, O. (1985). Motivations to remit: evidence from Botswana. *Journal of Political Economy,* 93(5), 901-918.

Matuzeveviciute, K. and Butkas, M. (2016). Remittances Development level, and Long-run Economic growth" Economies, 4(28).

Mbutor, M. O. (2010). Can monetary policy enhance remittances for economic growth in Africa? The case of Nigeria. *Journal of Economics and International Finance,* 2(8), 156-163.

McKinnon, R. I. (1973). Money and capital in economic development. Washington DC: Brookings Institution.

Nevin, A. S. and Omosomi, O. (2020). Strength from Abroad the Economic Power of Nigeria's Diaspora. https://www.pwc.com/ng/en/pdf/the-economicpower- of-nigerias-diaspora.pdf.

Ngozi (2019). Using Monetary and Fiscal Policy Mix to Restore Macroeconomic Equilibrium: An Examination of Contemporary Realities. *Journal of Economics and Allied Research,* 3(2), 54 – 68.

Nnenna, N. M., Ihemeje, J. C., and Anumadu, E (2016). The Impact of Monetary Policy on the Economic Growth of Nigeria. *An International Multi-disciplinary Journal, Ethiopia,* 10(3), 192-206, *Doi: http://dx.doi.org/10.4314/afrrev.v10i3.13.*

Oluwaseun, A. M. (2012). Monetary policy and economic growth nexus in Nigeria. *Ianna Journal of Interdisciplinary Studies*, 3(2), 92-103.

Omonzejie, P. I., and Madueme, S. I. (2020). Financial deepening and the manufacturing sector Output in nigeria *Journal of Economics and Allied Research,* 4(2), 75 – 92.

Onyeiwu, C. (2012). Monetary policy and economic growth of Nigeria. *Journal of Economics and Sustainable Development,* 3(7), 62 -70.

Osigwe, A. C. and Madichie, C. V. (2015). Remittances, Exchange Rate and Monetary Policy in Nigeria. *Global Journal of Management and Business Research: B Economics and Commerce,* 15(6), 1-6.

Rajan and Subramanian (2005). "What Undermines Aids Impact on Growth?" IMF Working Paper 05/147.

Salahuddin, M. and Gow, J. (2015). The Relationship between Economic Growth and Remittances in the Presence of Cross-Sectional Dependence. *The Journal of Developing Areas* 49(1).

Salisu, A., Haladu, A. I. and Suwaid, Z. S. (2022). An Empirical Investigation of Remittance Shocks on Economic Growth in Nigeria: Effect COVID-19 on Economic Growth for 2019-2020 Years. *Asian Journal of Economics, Business and Accounting,* 22(4), 23-49.

Sebastine, A. I., Nnamdi, A. C., Uche, O. M., and Uche, U. C.   (2019). Effects of Education on International Remittances Inflow and Migration Propensity in Nigeria. *Journal of Economics and Allied Research,* 3(3), 18 – 27.

Shaw, E. S. (1973). Financial deepening in economic development. New York: Oxford University Press.

Ukashatu, A.Y., Utai, U. H., Aliyu, J., Haladu, A. I., DaraDara, J. B. and Balarabe, I. I. (2020). Impact of Remittances on Economic Growth in Selected Sub-Sahara African Countries. *Yobe Journal of Economics,* 6(2), 43-56.

Ukeje, E. U. and Obiechina, M. E. (2013). Workers' Remittances – Economic Growth Nexus: Evidence from Nigeria, Using An Error Correction Methodology. *International Journal of Humanities and Social Science,* 3(7), 212-227.

World Bank. (2020)*COVID-19: Remittance flows to shrink 14% by 2021*. The World Bank. https://www.worldbank.org/en/news/press-release.   covid-19-remittance-flows-to-shrink-14-by-2021.