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DIASPORA REMITTANCES AND DIGITALISATION IN NIGERIA

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Abstract *Nigeria is a rising destination for diaspora remittances, which now constitute an important and stable source of foreign exchange to low- and middle-income countries around the world. The importance of remittance lies in its contribution towards the growth of the economies and the welfare of their peoples. Actual transfer of such funds, hitherto non-digital, now trends towards digital processes, which processes are expected to play an important role in its growth. Data from World Bank's World Development Indicators for the period 1989 to 2023 was employed to estimate a linear, single equation model in which digitalization, proxied by the number of mobile cellular subscriptions per 100, served as an explanatory variable, among others, in a bid to explain diaspora remittances. It was found that digitalization had a significant effect on remittances only at the 10% level of significance. It also had a negative effect. This was attributed to the number of devices, deemed below the benchmark, to which a reasonable magnitude of transfers could be attributed. It was recommended that internet access corridors should be widened in rural areas where a good chunk of remittance recipients reside. It was further recommended that Industrial policy, now the vogue in developed economies, should be urgently developed for the Information and Communication sub sector as a way of facilitating technology adoption and access to devices that play prominent roles in the remittance cycle.*

Keywords Digitalisation, Diaspora remittances, Migrant remittances, Nigeria

Introduction

Nigeria received $19.5 billion in Diaspora remittances in 2023, constituting 35 percent of remittance flow to sub-Saharan Africa. Although this was a decline of almost 3% over the previous year, its magnitude and country share showed how important such channel could be in the country's quest for diversified foreign exchange inflow. For improved remittance inflows, attention has shifted to transaction costs, among other factors (World Bank, 2024). The global average cost of sending $200 in 2023 was 6.4 percent of the amount being sent, slightly up from 6.2 percent a year earlier (World Bank, 2024a). Digital remittances averaged 5

percent compared with 7 percent for non-digital method, showing promise of lower cost. Both methods remained well above the Sustainable Development Goal target of 3 percent, and the gap between the actual and desired rates indicates prospects for further cost reduction. With lower cots the possibility of redirecting informal flows to formal channels becomes more realizable. It will also improve the prospects of financial inclusion.

For a while now, the world has focused on the effort to digitalise, and Nigeria has not been idle in this. Beginning from the Information and Communication subsector, and the first wave of computerization, the effort has taken effect in the financial sector where internet banking has made great strides. The idea of a cashless economy was conceived, its implementation initiated but later halted by the monetary authorities. A virtual version of the national currency, the eNaira, was also launched (CBN, 2021). Remittances increased nearly four-fold from $139 million in January 2024 to $553 million in July 2024 (CBN, 2024). What remains unclear is whether such increases are attributable to the monetary authority's claim of the efficacy of its monetary policy tightening measures or in spite of it; that is, arising in part because of the use of Information and Communication technology (ICT) and the change in the ways of carrying out transactions through electronic commerce, the flexibility of banking operations through internet banking, etc., since for altruistic and other reasons many migrants cannot but remit money home.

Digital remittances are cross–border money transfers made over the internet by the migrant population. Digitalization of remittance spurred by development in ICT promises not only substantial cut in cost of remittance, but also enhanced convenience, time saving and improved trust thereby promoting development in the financial sector (Jemiluyi & Jeke, 2023). Digital remittances have involved parallel mobile and online banking technology, and in response to the increasing demand, many new operators have entered the marketplace and developed global businesses in digital and mobile commerce. The increase in digital remittances is thus viewed as both positive and a necessary trend that is worth scaling up amongst the most vulnerable population.

Given the above context, digital remittance services could play a vital role in changing the landscape of remittance transactions in Nigeria. The improved landscape will expectedly spike remittances, emboldening their well-known beneficial effects and more. These effects include: provision of lifeline for millions of households, inclusion and growth in the financial sector (Anzoategui et al., 2011), reduction of inequality and poverty (Azizi, 2021), fueling domestic investment (Asongu & Odhiambo, 2020); promoting industrialization (Francois et al., 2022), and financial development in developing countries (Orozco & Fedewa, 2005). The need to ensure a favourable digitalization landscape begins from establishing its de facto effect as presently configured. We therefore explore how digitalization presently impacts diaspora remittances in Nigeria.

Brief Review of Related Literature

Conceptual Review: Remittances Flows

The concept of remittances has been linked to the theory of migration. For completeness, its definition is necessarily linked to its motives, effects, uses, nature of transfer and the channel of funds transfer. Remittance flows represent any monetary and/or in-kind transfers that migrants send home to family members or other beneficiaries – through formal or informal channels (World Bank, 2005). Remittances are pro - cyclical if they are driven by investment and profit motives. Remittances behaving pro-cyclically is premised on the optimization of investment motives of migrants. This is the portfolio approach in which remittances respond positively to favourable macroeconomic indicators in the migrant's home country. A distinction is also made amongst remittance flows based on the transmission mechanism. According to Isaacs (2012), it is common to group these transactions in binary categories, which may include: official versus unofficial, formal versus informal, regulated versus unregulated, legal versus illegal and recorded versus unrecorded. These binary categories reflect different things. For instance, "informal remittances" are usually defined as transfers initiated outside the formal banking system and outside the main money transfer businesses such as the Western Union.

Theoretical Review

Relevant theoretical frameworks for assessing the macroeconomics of remittances include the Keynesian model, the Mundell-Fleming model and the Rybczynski effect. The pure Keynesian model is the oldest model that tries to capture the short-run macroeconomic impact of international transfers. Under the assumptions of sticky prices, fixed exchange rate, financial development and interest rates, and in the absence of supply constraints, this model shows that any shock on the demand side has a disproportionate effect on the national output. Obviously, the magnitude of this impact depends on the Keynesian multiplier (which, itself, depends on several parameters such as the marginal propensity to import), and on the size of the transfer shock (which itself depends on the amounts received and, on the recipients' marginal propensity to consume remittances). As is well known from the works of Modigliani or Friedman, the propensity to consume must be related to the agents' expectations regarding future income streams (which include remittances).

In view of the fact that remittances bring an increase in income and boost aggregate demand, it has a magnified effect on real GDP growth. Economic activity in the migrant workers' host country has been proved to affect the economies of both countries positively and allow migrants to increase their employment and earnings prospects, which in turn allows migrants to send more money home (IMF, 2008).

The stock of migrant workers in a host country is seen to be an obvious determinant of remittances: the greater the volume of workers, the greater the expected volume of remittances. In an extension of the Heckscher-Ohlin model, labor emigration can be seen as a decreased availability of the factor of production in the home country, with the impact on growth depending on the behavior of other factors and the degree of

substitution among them. The welfare implication of the decline in the abundant factor should be positive, as per capita income of those left in the home country would increase.

Empirical Review

The continuous and persistent increase in the rates of migration, migrant remittances and diffusion of technology world over, and particularly in the developing regions, have spiked interest in matters related directly and indirectly to diaspora remittances. Studying the role of diaspora remittances on Nigeria's human capital development, Nangih & Nwineewil (2024) analysed data from Central Bank of Nigeria's statistical bulletin and World Bank's world development indicators for the period 2010 to 2023. They found a positive and statistically significant effect of remittances on human development index in Nigeria. They recommended an improved remittance mechanism to achieve a more seamless remittance experience. This has proved to be considerably challenging to the world community and borders on digitalization.

On growth of the receiving economy, Mbadiwe & Egesimba (2024) revisited the impact of remittances on the growth of the Nigerian economy. They found a positive and statistically significant effect of remittance on real growth of the economy in the long run as expected. Their short run dynamics did not confirm this finding, however. An interesting outcome of their study was the lack of significant effect on growth of the economy exhibited by overseas development assistance, which points to the more beneficial aspects of remittances. Their recommendations focused on efforts to reduce transactions costs including taxes, as a panacea for improved migrant remittance flow. Alleviation of tax burden, it is hoped, will encourage more use of official channels following which data on actual transaction can be obtained. This again borders on digital improvement of the remittance process.

The prospect of harnessing the full potentials of migrant remittances for development was explored by Akanbi & Yusuf (2024). They interrogated the relationship between governance qualities and remittances in Nigeria relying on data spanning the period 1990 t0 2022. They found that the aspects of governance they incorporated had significant effects on remittances. These were the rule of law, government effectiveness and political stability. They concluded that trust can be engendered in migrants and through trust the volume of remittances can be influenced if good governance and especially transparency are cultivated. Transparency will lead to reduced costs, which can be brought about through digitalization.

Chukwu (2024) investigated how, if at all, sustainability in community development could be achieved using migrant remittances. Using a multi stage sampling technique, in depth interviews and focused group discussions, the three senatorial districts in Abia State, Nigeria, were covered. The dominant views unearthed were that migrant remittances had been a major community development strategy, and that migrant-friendly legislation had been a boost to home bound remittances. Support for data collection projects that can promote high quality decision making on community development was recommended. This was expected to bolster the potential community

development impact of remittances. In addition, policies that can facilitate easy flow of remittances were called for, which in the main concerned financial sector development and digitalization.

A comparative analysis of the effects of migrant remittances on the growth of the economy was carried out between Nigeria and South Africa by Thomas et al (2025). The period covered was from 1983 to 2022 and data came from CBN's Statistical bulletin and WDI. The authors found that remittance had similar effect on both economies. This similarity was a positive effect of remittance on growth in Nigeria as well as South Africa but not in a statistically significant way in both economies. They seemed to believe that the significance of the positive effect of remittances on economic growth would be achieved by increases in volume of remittance, and as such called for policies that could facilitate migration which in turn was expected to increase remittances. Harmonization with migrant destination economies was advised in order to facilitate migration. This calls for data centric processes.

The legal perspectives in migrant remittances were taken up by Thang & Anh (2025). They sought to evaluate differences between the remittances of migrants and migrant workers as well as gender-based remittances and other demographics in Vietnam. For this purpose, they employed a cross sectional data across the country comprising 1680 observations. They found that, in addition to gender, several other demographics turned out to be core determinants of remittance flow into Vietnam and these include age, marital status and of course income. They found that female migrants appeared more likely to send money home than male migrants. Concerning immigrant workers, female workers were less likely to send money home than their male counterparts. Generally, workers sent more money home than migrants. For both workers and migrants, language proficiency was found to impact remittance positively, prompting their recommendation of skills set acquisition and foreign language proficiency attainment at home before migration. These encourage and enhance the use of technologically advanced remittance processes which the workers and migrants encounter abroad.

The empirical review indicated that diaspora remittance inflows are motivated by micro- and macro-economic factors including migrant status, demographics, level of economic development in both the host and home countries, exchange and interest rates differential, inflation, size of a country diaspora and digitalization. The review further shows that the possible role of digitalization in diaspora remittance is accentuated by its prospects for transactions cost reduction but it's role has not been adequately considered for Nigeria.

Methodology

The study adopted a linear single equation model, as is common in the literature, with diaspora remittances serving as the dependent variable while selected macroeconomic variables, and a proxy for digitalization, serving as the explanatory variables. The following macroeconomic variables were selected: exchange rate (Humberto et al, 2007), domestic financial

development (Giuliano & Ruiz-Arranz, 2005), and gross domestic product.

The single equation model is thus: Rem = f (mcsp, reer, bm, lgdp) …… (1)
Where:
rem = diaspora remittances
mcsp = mobile cellular subscriptions
reer = real effective exchange rate
bm = broad money (for financial development)
lgdp = gross domestic product in log form
The following model was estimated:

$$rem = \omega_0 + \omega_1 mcsp + \omega_2 reer + \omega_3 bm + \omega_4 lgdp + \varepsilon \ldots\ldots\ldots\

Lngdp	-3.693511	-2.954021	I(1)

Source: Authors' computation

Following the data diagnostic outcome in Table 1, the ARDL model procedure was selected with its two-stage, co-integration bounds test. The bounds test proved inconclusive with the F statistic falling between the bounds (Table 3)

Table 2: ARDL Bound Co-Integration Test Result

F-Statistic	K	Significance Level	Critical Bound Value	Upper Bound Value)
3.066465	4	5%	2.947	4.088

Source: Authors' Computation

Using the error correction term (coint eq (-1)) obtained from the ARDL model, the short run dynamics were investigated. The resultant value of -0.467203 was considered adequate being negative and less than one and also highly significant (Table 3)

Table 3: Summary of Short Run Relationship Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.467203	0.100050	-4.669687	0.0001

Source: Authors' Computation

For robustness, cointegration test was conducted using the Johansen cointegration procedure. Using the Trace Statistics, the result confirmed cointegration of the series (Table 4).

Table 4: Cointegration Test

Series: REM MCSP REER BM LGDP
Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.635604	96.15123	69.81889	0.0001
At most 1 *	0.565730	62.83726	47.85613	0.0011
At most 2 *	0.432303	35.31232	29.79707	0.0105
At most 3 *	0.293349	16.62881	15.49471	0.0336
At most 4 *	0.145026	5.170595	3.841466	0.0230

Source: Authors' computation

Results

The following results (Table 5) were obtained:
Table 5: Summary of Levels Equation
Dependent variable: Remittance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Mcsp	-0.117037	0.059216	-1.976445	0.0584
Reer	14.73100	4.527045	3.254000	0.0031
Bm	-0.012042	0.011235	-1.071832	0.2933
Lgdp	-0.173090	0.222480	-0.778001	0.4433
C	-375.2314	116.1668	-3.230108	0.0032

Source: Authors' Computation

Diagnostics of the results were carried out. These consisted of the Normality Test, Breusch-Godfrey Serial Correlation LM Test as well as Stability Tests. The results showed that the residuals were normally distributed (Appendix 1), and exhibited no serial correlation (Appendix 2). The Impulse response functions exhibited stability, being within bounds (Appendices 3 & 4)

Mobile cellular subscriptions had a statistically significant effect on migrant remittances even if marginally. However, the effect turned out to be negative. This can be explained by the composition and process of remittances or money transfers. Institutional channels, for example Western Union, operating through banks, presently dominate such transactions, while the use of cellular phones and connected applications have yet to take sufficient effect in direct cross border remittances to reach the benchmark from whence, they might accelerate and have positive effect on remittances. Many recipients cannot but rely on formal financial or institutional channels on account of their infrastructural and income limitations, i.e. lack of internet access and compliant equipment.

The negative effect was shared by domestic output, and points to the fact that the dominant reasons for migrant remittances in Nigeria are disconnected with the state of the economy. They are rather to boost private consumption and private investments. Exchange rate alone was true to a priori expectation being positively signed, economically non-trivial and statistically significant at the 5% level. A rise in Naira exchange rate, being equivalent to a devaluation of the domestic currency for the migrant, led to higher remittances.

Conclusion

The study re-examined the factors which impact diaspora remittances, in particular the role of digitalization. This was considered important because remittances have risen in importance in Nigeria's ever-growing need for foreign exchange and digitalization is the global next-foot-forward, productivity wise. Relying on data from World Development

Indicators, mobile cellular subscriptions, which represented digitalization in Nigeria, proved to have a significant effect on diaspora remittances. This effect was however negative and was traced to the negligible share of remittances presently conducted using such devices.

Recommendation

The following are the recommended policy actions.

1. Internet access should be provided in the rural communities where most remittance recipients reside.
2. Industrial policy, specifically targeting ICT sub sector and aimed at digitalizing information and communication flow, needs to be developed.
3. Facilitation of leapfrogging in technological device adoption, in particular in the ICT subsector.
4. Enthronement of the rule of law which assures property rights of migrants.

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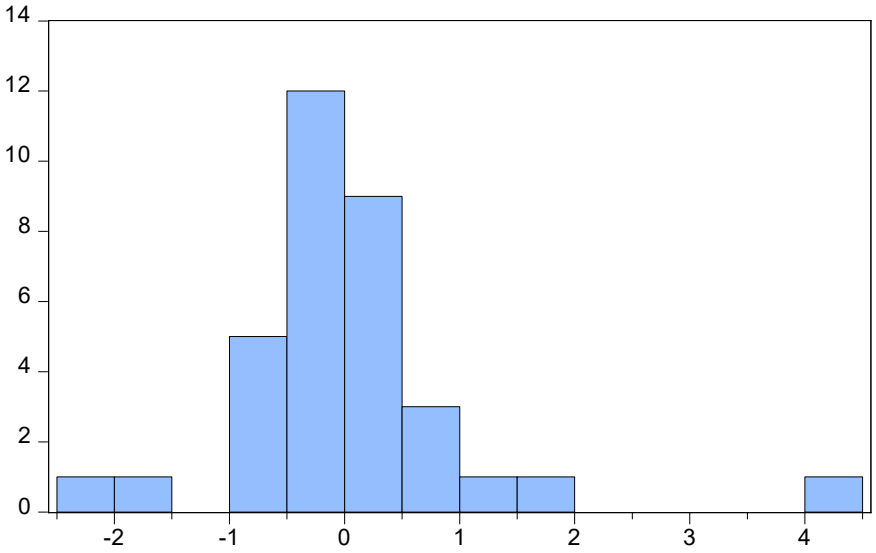
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APPENDIX

APPENDIX 1



Series: Residuals
Sample 1990 2023
Observations 34

Mean	-1.17e-14
Median	-0.101546
Maximum	4.348615
Minimum	-2.143602
Std. Dev.	1.046227
Skewness	1.960749
Kurtosis	10.33809
Jarque-Bera	98.06972
Probability	0.000000

APPENDIX 2: Breusch-Godfrey Serial Correlation LM Test:

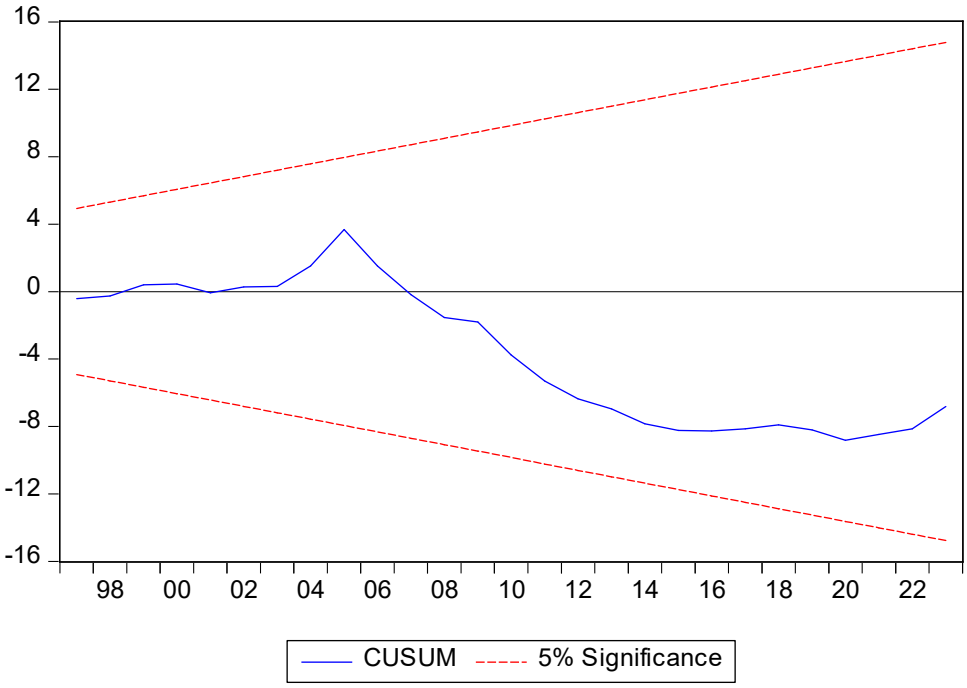
F-statistic	1.264602	Prob. F(2,25)	0.2998
Obs*R-squared	3.123699	Prob. Chi-Square(2)	0.2097

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 01/22/25 Time: 21:27
Sample: 1990 2023
Included observations: 34
Presample missing value lagged residuals set to zero.

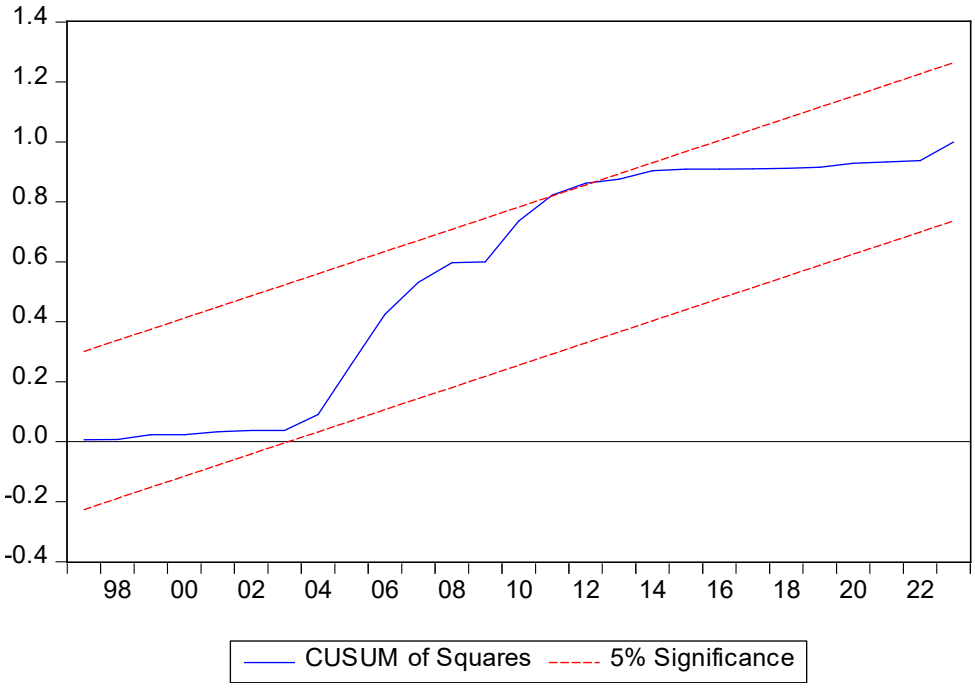
Variable	Coefficient	Std. Error	t-Statistic	Prob.
REM(-1)	0.334865	0.298371	1.122313	0.2724
MCSP	0.018748	0.034267	0.547119	0.5891
LGDP	-1.393422	6.244046	-0.223160	0.8252
LGDP(-1)	-1.665981	6.927067	-0.240503	0.8119
REER	8.88E-05	0.004865	0.018258	0.9856
BM	0.013806	0.102447	0.134767	0.8939
C	78.59434	82.40503	0.953757	0.3493
RESID(-1)	-0.428385	0.391438	-1.094387	0.2842
RESID(-2)	-0.408763	0.263291	-1.552515	0.1331

R-squared	0.091873	Mean dependent var	-1.17E-14
Adjusted R-squared	-0.198727	S.D. dependent var	1.046227
S.E. of regression	1.145477	Akaike info criterion	3.331446
Sum squared resid	32.80292	Schwarz criterion	3.735482
Log likelihood	-47.63458	Hannan-Quinn criter.	3.469234
F-statistic	0.316150	Durbin-Watson stat	2.040534
Prob(F-statistic)	0.952417		

APPENDIX 3> CUSUM



APPENDIX 4: CUSUM OF SQ



Appendix 5:
Pairwise Granger Causality Tests
Sample: 1989 2023
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
MCSP does not Granger Cause REM	33	0.99011	0.3842

REM does not Granger Cause MCSP		8.95679	0.0010
REER does not Granger Cause REM	33	0.01733	0.9828
REM does not Granger Cause REER		0.01796	0.9822
BM does not Granger Cause REM	33	0.03070	0.9698
REM does not Granger Cause BM		5.55186	0.0093
LGDP does not Granger Cause REM	33	2.46253	0.1035
REM does not Granger Cause LGDP		1.56707	0.2264
REER does not Granger Cause MCSP	33	0.55141	0.5823
MCSP does not Granger Cause REER		0.16576	0.8481
BM does not Granger Cause MCSP	33	0.20709	0.8142
MCSP does not Granger Cause BM		7.74716	0.0021
LGDP does not Granger Cause MCSP	33	9.14934	0.0009
MCSP does not Granger Cause LGDP		4.14524	0.0265
BM does not Granger Cause REER	33	0.60943	0.5507
REER does not Granger Cause BM		0.50771	0.6073
LGDP does not Granger Cause REER	33	0.96452	0.3935
REER does not Granger Cause LGDP		0.36708	0.6960
LGDP does not Granger Cause BM	33	7.04206	0.0033
BM does not Granger Cause LGDP		0.55349	0.5811