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MIGRATION-REMITTANCE NEXUS IN A DEVELOPING COUNTRY: EVIDENCE FROM NIGERIA

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ABSTRACT

This study analyzed the relationship between migration and remittances in Nigeria. Employing the Autoregressive distributed lag (ARDL) model, this study empirically investigates the determinants of remittances on the inflows of remittance to Nigeria by employing time series data from the year 1977 up till 2018. Our findings validated the simple theoretical consideration which states that flow of remittances should be encouraged by chief macroeconomic determinants like exchange rate, rate of inflation and financial development. This study finds that these variables together played vital roles in influencing the inflows of remittance to Nigeria. Specifically, migration, inflation and exchange rate have significant impact and favorably encourage remittances inflows from abroad to Nigeria. On the contrary, remittances negatively responded to financial development. Furthermore, the relative significance of these determinants of remittances varies. Specifically, migration is more responsive compared to exchange rate and inflation because the elasticity is higher, also migration and exchange rate are found to have better statistical influence compared to inflation in Nigeria.

Keywords: Determinants; Developing Country; Migration; Nigeria; Remittance.
JEL: F22; F24; F31; J15; J61; O15

INTRODUCTION

It is worthy to know that remittance are simply the conversion of payments sent by the international migrants for use in their source country (Nadeem et al., 2020). Remittance have recently drawn the focus of academicians, general public and policy makers. Previous studies observed that

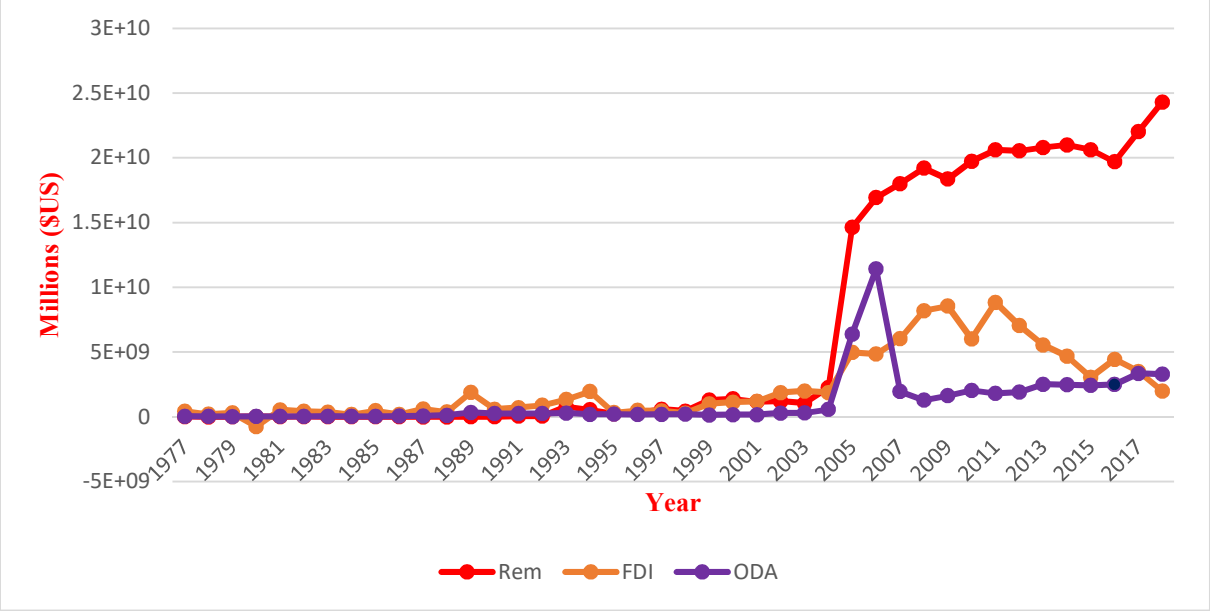
remittances could sustain and maintain economic stability and assist to minimize adverse shock mostly in developing nations through inducing rate of economic growth (Jouini, 2015), levels of poverty and inequality (Abbas et al., 2017; Adams & Page, 2005; Heffernan, 2018; Taylor, 1992). The likely benefits associated to the received remittances are of significance to developing country like Nigeria, where the living standard is low, high unemployment and prevalent poverty. Remittances to a source country could also rise the source country creditworthiness (Ratha, 2013). There are studies that advocated remittances could elevate education level, gender equality and health (Heffernan, 2018; Yang, 2005) and ease constraints of liquidity in scenario of lack of standard capital markets (McCormick & Wahba, 2003; Ratha, 2013), they all got long-term development consequences. Therefore, any little fluctuations in flows of remittance could have substantial influence on stability of the economy. Migration from the developing to developed nations have produced massive remittances inflow to developing nations like Nigeria. Remittance inflows to developing countries had considerably improved in the last decade worldwide including Nigeria and remittances signify one of the chief sources of Nigeria's foreign exchange.

Remittances are more stable over time and quite unchanging source of foreign exchange in comparison to other international financial inflows like the foreign direct investment (FDI) and the official development aid (ODA) (Heffernan, 2018; Kajdi & Ligeti, 2020; Ratha, 2013; Singh, 2006). The remittances of migrants exceeded the received FDI and ODA to lots of nations (Tabit & Moussir, 2016). Figure 1 below illustrates the remittances, FDI and ODA inflows to Nigeria from 1977 up to 2018. In 2018, the remittances received by

Nigeria was $24 billion (WDI). This figure of remittances in 2018 is 17 times larger in terms of figure since 2000, 139 times of ODA and 21 times of FDI to Nigeria of the same year 2000. Besides, this types of inflows of capital to developing countries is agreed to be under-estimated due to many transfers that are undertaken via channels that are unofficial (Ngoma et al., 2018). In addition, remittances inflows to Nigeria had rose continuously from 2004 except for 2008 where small decrease was noticed. The decline from 2007 to 2008 is linked with global financial crisis that hindered employments in lots of migrant host countries and slight decrease in 2016 because of national election and its aftermath in Nigeria. Even with persistent rise of remittances and its potential importance in provision of foreign exchange for the economic development and growth, amazingly, few empirical studies are known on the factors accountable for the inflows of remittances into migrant's countries of origin specifically in Nigeria. Some empirical evidences had made efforts to investigate the rate of exchange effects and some important economic variables on inflows of remittance to African countries. For illustration, El-Sakka & Mcnabb (1999), Elbadawi & Rocha (1992) and some researchers showed that variation in levels of economic activities, interest rate and rates of exchange are chief determinants of remittance.

Comprehending what inspired the volume of the received remittances allows policies to be executed which does not decrease remittance inflows. Developing countries could hence take full advantage of the financial benefits of the remittances if the variables are comprehended. With the increasing importance of remittances to the developing countries, it's important to comprehend the model and possible determinants through employing time series

data. Migrants like some participants of currency market, are touched through huge rates of exchange swings. The fluctuations in rates of exchange affects the choices by migrants abroad with regards to volume of remittances. This study intent to empirically investigate factors responsible for rapid rise in remittance inflows to Nigeria. By focusing particularly on Nigeria, it attains a better-off analysis of remittance role in the country compared to those provided by global coverage studies. We also investigate the connection between the remittances from abroad with the numerous variables. In addition, we examine the chief determinants which could be accountable for the disparity in inflows of remittance and evaluate the effect of individual determinants on remittances by employing empirical data from 1977 up to 2018 and ARDL model. Our study estimates both short run and the long run links between remittance and the variables that are supposed to stimulate them, generally, past studies had examined only the long-run relationship. Our paper supplements the commonly employed data set and applied Nigeria's data. It is likely that the increase in remittances from 2004 upwards could be partly because of unofficial mediums for transfer of money which are unattractive due to devaluations of exchange rates. The balance of our study is: Section 2 discussed the literature review on determinants of migrants' remittances, section 3 estimates our methodology, section 4 discussed our empirical outcomes and section 5 conclude the study.



Note: Rem is the remittances, FDI is the foreign direct investment and ODA is the official development aid.
Figure 1: Remittances and some capital flows to Nigeria from 1977 up to 2018.

LITERATURE REVIEW

Because of the significance of remittances to beneficiary country's development, it is imperative to evaluate the factors that determines the migrants to remit their incomes gotten from their host countries. We deliberate on the empirical reviews of various determinants of migrants' remittances and reveal that almost all the studies cited are lacking a key variable that could impact remittances, that is, migrant.

Taking into consideration the individual determinant, exchange rate plays a key role in both the recipient and source country. The relationship found between these two variables (remittance and exchange rate) is ambiguous because if the country's currency of the migrant appreciates, then following altruism as in the case of Sri Lanka, migrants shall decrease their remittances since the same quantity of goods in the home country could be bought with less currency of the host country (Lueth & Ruiz-Arranz, 2007). On the other hand, the

migrant's currency appreciation against the country's currency of the recipient could possibly rise the remittance value in country of the recipient, if the migrant does not exchange the remittance amount into their domestic currency (Lueth & Ruiz-Arranz, 2008). It was validated by a study in Bangladesh and Philippines (Sarkar & Datta, 2014; Yang, 2008). Looking at the case of India, the bilateral rate of exchange does not significantly impact on remittances (Singala & Allamraju, 2011).

A different determinant, that is, inflation plays a key role on the volume of remittance. Aydas et al. (2005) confirmed the significant impact of inflation on remittances of Turkish. A study done by Glytsos & Katseli (1986), showed the inflation rate of the recipient country is negatively related to remittances due to fact that migrants would remit later in other to evade the effect of inflation. Conversely, high level of inflation in home country leads to rise of remittances in other to compensate the fall in the home country's purchasing power. Although, the signs of the influence of the inflation on the remittance is both positive and negative, Buch & Kuckulenz (2004) finds the impact as indecisive. Another key factor is the financial sector development which could be estimated by computing domestic credit to the private sector as a percentage, of the gross domestic product (GDP). Higher financial sector development decreases the cost of transaction hence making it cheaper and easier for remittances to be sent via the official channels (Freund & Spatafora, 2005; Ngoma et al., 2018; Singh et al., 2011). In addition, another key factor is the migration (measured by migrant stock). The source country's total number of migrant was found to be having positive significant effect on remittances volume (Elbadawi & Rocha, 1992; Straubhaar, 1986; Swamy, 1981). Elbadawi & Rocha (1992) in North Africa

finds the impact of number of migrant workers on remittance as positive while in Turkey, it was not significant (Aydas et al., 2005).

METHODOLOGY

Empirical model

For us to investigate the migration-remittances nexus, this paper employed time series data commencing from 1977 up till 2018 using Nigeria's data. The choice of the time period was based on data availability, with the data, we employed ARDL bounds testing approach. This study followed the model of El-Sakka & Mcnabb (1999) and Ngoma et al., (2018) with modifications. This study modified the model by adding migrant to explain the angle where the study wants to view the migration-remittances link. The functional form of the model is given as:

$$REM = f(MIG, INF, FD, EXR) \quad (1)$$

Equation (1) shows that REM (remittance) is the function of MIG (migrant) and control variables like INF (inflation), FD (financial sector development) and EXR (exchange rate). Equation (1) model is specified in econometric form which gives:

$$REM_t = \theta_0 + \theta_1 MIG_t + \theta_2 INF_t + \theta_3 FD_t + \theta_4 EXR_t + \varepsilon_t \quad (2)$$

From Equation (2) model, taking logarithm of both sides gives:

$$\ln REM_t = \theta_0 + \theta_1 \ln MIG_t + \theta_2 \ln INF_t + \theta_3 \ln FD_t + \theta_4 \ln EXR_t + \varepsilon_t \quad (3)$$

where; REM is the remittance, MIG is the migrant; INF is the inflation, FD signifies the financial sector development, EXR signifies the exchange rate, $\theta_0 - \theta_4$ and ε_t are the coefficients of explanatory variables and Gaussian error term respectively.

Description of variable in the model

(a) Dependent variable.

The dependent variable and main concern that is considered in this study is Remittance (REM). It refers to official remittances of

workers and employee's compensation received by migrants' source countries. Remittance have been used widely in both theoretical and empirical studies (El-Sakka & Mcnabb, 1999; Ngoma et al., 2018; Straubhaar, 1986). Given the fact that the remittances of workers are partly transferred for motives of investment (Schiopu & Siegfried, 2006), their flows to the migrant-sending countries are expected to be influenced by economic conditions (Bouhga-Hagbe, 2004). Factors like migrant real wages, rates of exchange, differential rates of interest, level of financial development, migrant and inflation are expected to influence inflows of remittance of workers of migrant-sending countries. Remittance is measured annually.

(b) Independent Variables.

Migrant (MIG) is the main variable in this study, it has been widely used in empirical literatures (Elbadawi & Rocha, 1992; Swamy, 1981; Tabit & Moussir, 2016). Migrant is measured by migrant stock, measurement is total and is being measured annually. Migrant stock refers to the number of people, living in an area or country other than that in which they were born.

Inflation (INF): One of the measures of uncertainties of the economy in migrants home country is inflation (Glytsos & Katseli, 1986). Increase in inflation or price-level undermined the credibility of policies in the migrant sending-country (Alleyne et al., 2008). Therefore, a higher inflation level in the home country of migrant may results in the lower worker remittance inflows for investment, because it depicts the uncertainty and increased risk (Arezki & Brückner, 2012). Given the fact that many empirical studies (El-Sakka & Mcnabb, 1999; Vargas-Silva & Huang, 2006) have stresses that inflows of remittance of workers decline as domestic inflation rises, this variable is added into the empirical model.

Financial development (FD) has been used in empirical literature (Ngoma et al., 2018). The measure of this variable is annually. It is being measured through the domestic credits to the private sectors, that is, it is financial resource that is offered to private sectors like - purchase for non-equity services, loans, trade credit and some receivable accounts which establishes repayment claims. Financial sector development ought to ease money transfer procedure through increasing numbers of the competing formal channels of remitting, which reduces cost of remitting and also influences the migrant workers to send their savings to their origin countries from their countries of host (Freund & Spatafora, 2008; Ngoma et al., 2018).

Exchange Rate (EXR) has been used in empirical literature and this variable measure is the price of one currency compared to another. It is determined through the country's authorities, which is expressed by units of local currency for the main destination countries of the migrant. The depreciation of domestic rate of exchange (defined as an index increase) is supposed to attract more inflows of remittance via a sale effect as domestics assets, services and goods becomes significantly affordable and cheaper to migrants that are earning foreign currencies (Ngoma et al., 2018; Ratha & Sirkeci, 2010). Besides, rates of exchange appreciation does negate the incentive to remit by migrants (Faini, 1994; Ngoma et al., 2018).

All our data in this paper are sourced from the WDIs and International Monetary Fund (IMF).

RESULTS AND DISCUSSION

Table 1 depicted the descriptive statistics of Nigeria for remittance and its explanatory variables during the reference years from 1977 up to 2018. Furthermore, the

remittance of Nigeria was over $21 billion placing Nigeria the biggest economy in Africa exceeding South Africa which has the value of $929 million. The mean of remittance is $5.6 billion with a minimum value of $2,424,527. The mean of the migrant for Nigeria is 679,595 people and with a minimum value of 347,909 people. Likewise, our variables are all normally distributed and the reason is from the values of probabilities as revealed through the Jacque-Bera. They are all more than the normal statistical significance levels. This recommends that concept of null hypothesis in our sequences are distributed normally which could not be rejected. In other words, our sequences are distributed normally. These results were additionally confirmed through skewness and kurtosis values of our series. All our variables are skewed positively. Variables like remittance, migrant and exchange rate are platykurtic whereas inflation and financial development are leptokurtic because their values are more than three.

Table 1: Descriptive statistics for the variables of interest

	REM	MIG	INF	FD	EXR
Mean	5.69E+09	679595.2	20.10705	9.356487	64.13053
Median	5.50E+08	487882.2	13.75708	8.152684	21.89526
Maximum	2.10E+10	1314845.	72.83550	22.26722	192.4405
Minimum	2424527.	347909.0	3.457650	4.948032	0.546781
Std. Dev.	8.61E+09	316257.0	17.23961	4.073027	66.25504
Skewness	1.001027	0.984006	1.565411	1.504319	0.404832
Kurtosis	2.070927	2.684860	4.454903	4.997568	1.443318
Jarque-Bera	7.916013	6.455121	19.36804	21.19355	5.003072
Probability	0.019101	0.039654	0.000062	0.000025	0.081959
Sum	2.22E+11	26504211	784.1751	364.9030	2501.091
Sum Sq. Dev.	2.22.E+21	3.80E+12	11293.76	630.4028	166809.7
Observations	39	39	39	39	39

Note: REM is the remittance, MIG is the migrant, INF is the inflation, FD is the financial development and EXR is the exchange rate.

This study employed ARDL by Pesaran et al., (2001). This techniques was employed base on three primary reasons which are: Firstly, it has the ability estimate short run and long run relationships amongst various variables that do not possess same

integration order in so far as the variables all are stationery at I(0), I(1) or both. However, none of them should be I(2). Secondly, the ARDL could eliminate the issues linked to autocorrelation and thirdly it could be employed in small sample size. To continue this, Augmented Dickey-Fuller (ADF); and the Phillips-Perron (PP) tests of unit root was used. The test of ADF (Dickey & Fuller, 1979); and the PP (Phillips & Perron, 1988) are revealed in Table 2:

Table 2: Results of test of unit root.

	ADF.		PP.	
Variables	Constant.	Con. & Trend.	Constant.	Con. & Trend.
		Level [*I(0)*]		
REM	0.186	-1.465	-0.033	-1.559
MIG	-1.649	-1.546	-1.797	-1.684
INF	-3.105	-3.050	-2.930	-2.864
FD	-2.078	-3.323	-1.581	-2.013
EXR	0.589	-1.987	0.592	-1.987
		First Difference [*I(1)*]		
REM	-4.730**	-5.440***	-4.731***	-4.822***
MIG	-5.782***	-5.789***	-5.782***	-5.789***
INF	-6.229***	-6.204***	-11.120***	-11.996***
FD	-5.532***	-5.667***	-6.206***	-8.536***
EXR	-5.440***	-5.633***	-5.440***	-5.633***

Note: ***, ** and * are significance at the level of 1%, 5% & 10% respectively. REM is the remittance, MIG is the migrant, INF is the inflation, FD is the financial development and EXR is the exchange rate.

Looking at Table 2, at level which is I(0), none of the variables is stationary. However, at first difference which is I(1), all the variables became stationery by employing the techniques of ADF and PP. Since the outcome for the tests of unit roots disclosed integration order of I(1), it meant there is possibility of long-run relationship. Giving this result, usage of ARDL model to evaluate and look for the long run association amongst remittance, migrant, inflation, financial development and exchange rate in Nigeria is justified.

ARDL BOUND TEST

This study carried out lag selection and automatically lag 1 was selected, the results depicted the optimal lag is ARDL (1, 0, 0, 0, 0). For us to test and know if ARDL

(1, 0, 0, 0, 0) model passed the diagnostic checks, we conduct LM, CUSUM and CUSUM square tests. The result of LM test is depicted by Table 3:

Table 3:- The Breusch-Godfrey Serial Correlation LM test.

F-Statistic.	1.732	Prob. F(1,31)	0.198
Obs*R-squared.	2.011	Prob. Chi-Square(1).	0.156**

From Table 3, our Prob. value is 0.156 and since our p-value is greater the 0.05 there is no serial correlation problem in the ARDL of this study. We conduct the stability test (CUSUM) shown by Figure 2. Our test of CUSUM showed our model is stable because our blue color line fell within the bound.

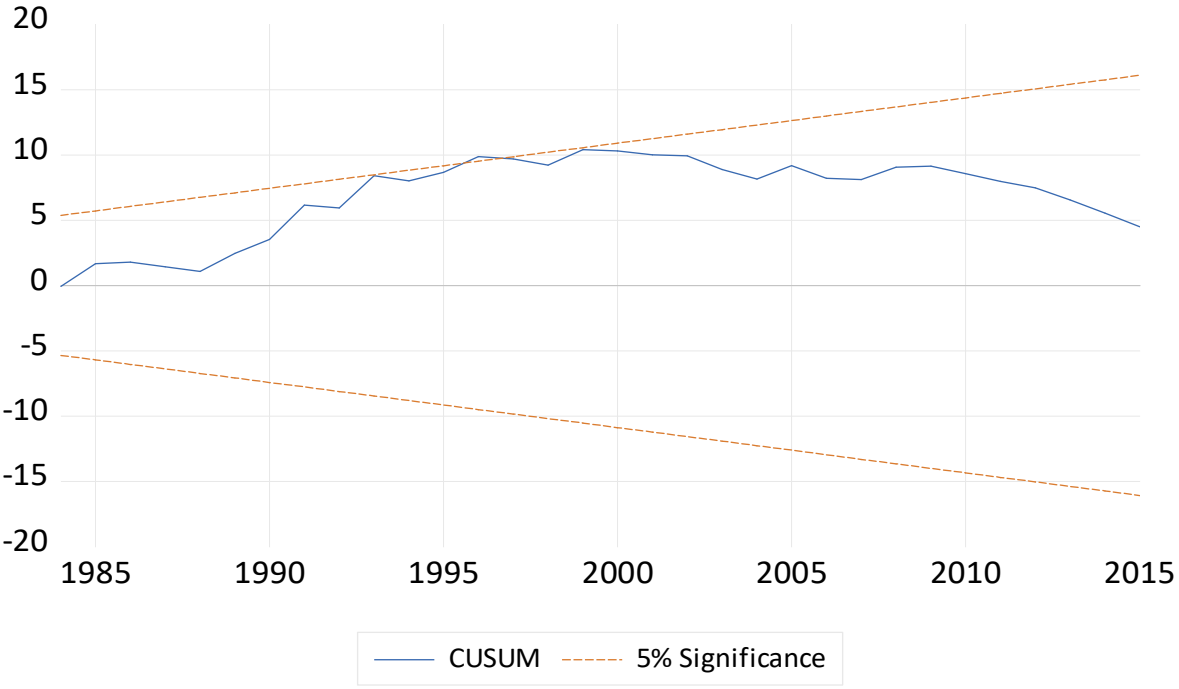


Figure 2: CUSUM test.

We now test the CUSUM square to check whether our residuals or our model is stable. It is depicted by Figure 3:

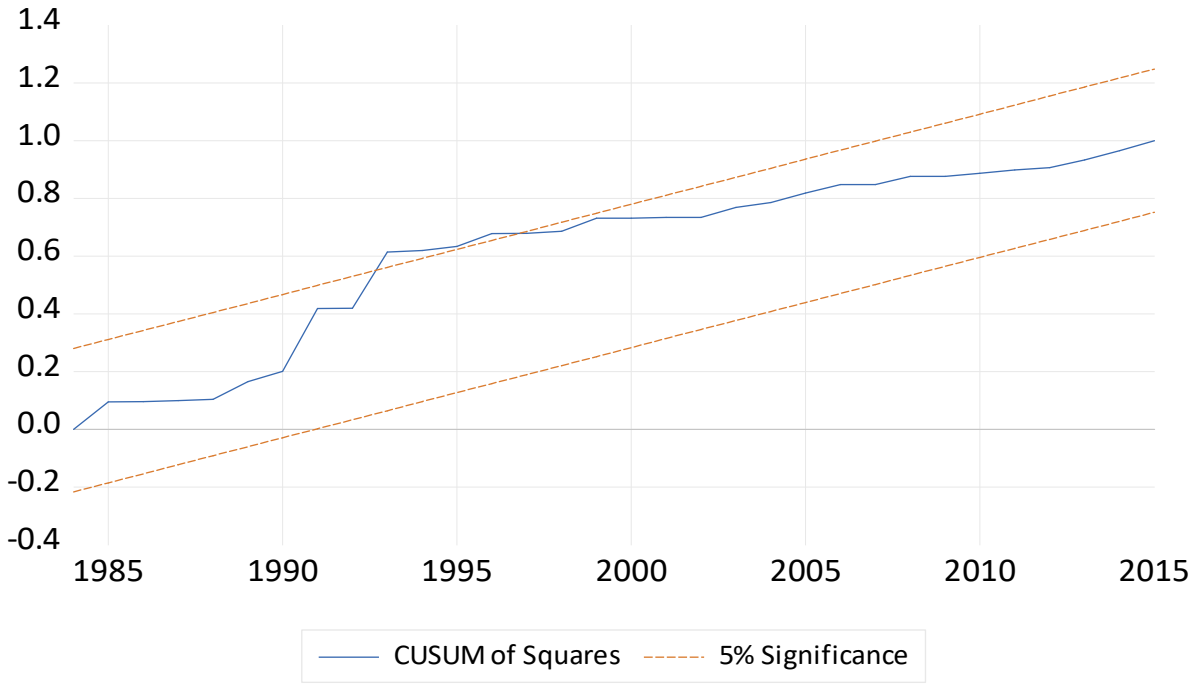


Figure 3: The CUSUM square test.

The CUSUM square showed that our residuals are stable or our model is stable because the blue color line fell within the bound. Since we have passed all the diagnostic checks (shown by Table 3, Figure 2 and 3), we have identified our optimal lag for the ARDL bound test, the next step is to test our long run relationship which is also known as bound test, the results are shown in Table 4:

Table 4: F-Bounds test to test presence of the long run cointegration relationships.

Test Statistic.	Value.	Signif.	*I*(0).	*I*(1)
		Asymptotic: n=1000		
F-statistic.	5.707	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
		Finite Sample:		
Actual Sample Size.	38	n=40		
		10%	2.427	3.395***
		5%	2.893	4**
		1%	3.967	5.455*

***, ** and * are significance at the level of 1%, 5% & 10% respectively.
Source: Computed with the use of E-view 11.

Table 4 depict the F-test = 5.707 which is greater than the critical values of finite sample (n=40). The values are 5.455, 4 and 3.395 which are significant at 1%, 5% and 10% respectively. Which means there is long run cointegration relationships amongst remittance, and its determinants which are migrant, inflation, financial development and exchange rate.

Table 5: Long run coefficients results.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LMIG	2.368	0.699	3.389	0.002
LINF	-1.023	0.499	3.389	0.049
LFD	-0.906	1.256	-0.722	0.476
LEXR	1.648	0.209	7.876	0.000
C	-11.688	8.581	-1.362	0.183

Note: LMIG is the logarithm of migrant, LINF is the logarithm of inflation, LFD is the logarithm of financial development, LEXR is the logarithm of exchange rate and C is the constant.

From Table 5, migrant, inflation and the exchange rate are the only significant determinants of remittances. Coefficient of migrant is positive and significant, this validates some studies (Mustafa & Ali, 2018; Swamy, 1981) however, it invalidated Tabit & Moussir (2016) got positive but insignificant result. If our migrant increases by 1%, then remittance tend to increase by 2.368%. This means inflation, financial development and exchange rate plays important roles in permitting migrant in making arrangement to increase remittance in SSA region. The coefficient of inflation is negative and significant, this validates Abbas et al., (2017) and invalidates Tabit & Moussir (2016). This implies that migrant, financial development and exchange rate have played vital roles in allowing inflation in making arrangement to decrease remittance in the region of SSA. If our inflation increases by 1% then remittances tend to decrease by 1.023%, this is probably because of repeated fluctuations in rates of inflation signifying the economy is unstable (Abbas et al., 2017; Elbadawi & Rocha, 1992). The coefficient of our exchange rate showed it is significant and positive which

validates Ngoma et al. (2018) and contradict Tabit & Moussir (2016) that got insignificant result. If our exchange rate increases by 1% then remittances tend to increase by 1.648%. This signifies that migrant, inflation and financial development have played roles that are important in permitting exchange rate to make arrangement to increase remittance in SSA countries. Migrant is more responsive compared to exchange rate and inflation because the elasticity is higher. The coefficient for financial development showed is negative and not significant.

Table 6: Short-run coefficients results.

Variables	Coefficients	Std. Error	t-Statistic	Prob.
C	-5.252	1.207	-4.351	0.000
ECT(-1)	-0.457	0.101	-4.537	0.000***
D(LREM(-1))	-0.151	0.130	-1.161	0.255
D(LMIG)	0.611	0.381	1.603	0.119
D(LINF)	-0.329	0.132	-2.487	0.019
D(LFD)	-0.239	0.456	-0.524	0.604
D(LEXR)	0.402	0.339	1.184	0.246

Note: C is the constant, ECT is the error correction term, LREM is the logarithm of remittance, LMIG is the logarithm of migrant, LINF is the logarithm of inflation, LFD is the logarithm of financial development and LEXR is the logarithm of exchange rate.

Table 6 presents the results of short run coefficients. One of the most interesting part of this result is that it is negative and the ECT coefficient lies between zero and one which is in line with theory, it also shows the evidence of convergence to long run equilibrium. Our ECT is -0.457, which signifies our model adjust at a speed of 45.7% back to its equilibrium. The adjustment for convergence back to long run equilibrium takes 2 years and 2 months (i.e. $\frac{1}{45.7}$ X $\frac{100}{1}$ = 2.2 years).

CONCLUSION

This study employed ARDL model and empirically investigates determinants of migrants' remittances on inflows of remittance to Nigeria with the use of time

series data from the year 1977 up till 2018. Our findings validate the simple theoretical consideration which states that inflows of remittance should be encouraged by chief macroeconomic determinants like exchange rate, rate of inflation and financial development. This study finds that these variables together played vital roles in influencing the inflows of remittances to Nigeria. Specifically, migrant, inflation and exchange rate have significant impact and favorably encourage remittance inflows from abroad to Nigeria. On the contrary, remittances negatively responded to financial development.

Furthermore, the relative significance of these determinants of migrants' remittances varies. Specifically, migrant is more responsive compared to exchange rate and inflation because the elasticity is higher, also migrant and exchange rate are found to have better statistical influence compared to inflation in Nigeria. In addition, determinants of migrants' remittances in the nation requires instant concentration which will strongly aid in employing remittances for the reduction of poverty, rising investment at the national level and therefore aid in boosting growth and enhancing sustainable development to Nigeria.

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