



Remittances, Trade Openess and Financial Sector Development in Nigeria

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ABSTRACT

The purpose of this study explores the impact of remittances on financial sector development in Nigeria data spanning from 1990 to 2021. The study used Autoregressive Distributed Lag (ARDL) and Toda Yamamoto (TY Causality) technique to examine the relationship between remittances and financial sector development. The result of the study indicates that remittances were found to have a positive significant impact on financial sector development during the period of the study real interest rate is also found to have a negative impact on financial sector development in Nigeria. Lastly, trade openness is found to have a positive statistically significant impact on financial sector development in Nigeria. The study recommends having established that remittances inhibit financial sector development, the government should employ policies that will encourage channeling remittances through a formal banking system. As well as ensuring that such remittances received are channeled to finance productive investment hence financial development. The novelty of this research lies in the fact that the study is against the few empirical studies that focused only on uncomplicated techniques in their analysis of data. Also, the study made use of the two main indicators of remittances in an economy, which are, trade openness, and real interest rate, to examine its impact on financial development in Nigeria.

INTRODUCTION

Migration has been a livelihood strategy among households in most developing countries. The World Bank reports that about 244 million migrants from developing countries lived and worked outside the country of their birth. Hence, only about 20 percent of sub-Saharan Africans educated abroad return home and the remaining 80 percent stayed on in the country of their study as migrants (World Bank, 2018).

The World Bank reported that Nigeria is one of the top recipients of remittance in Sub-Saharan Africa. The country was estimated to have received about 21 billion USD in remittances in 2012 as compared to 2.3 billion USD in 2004. It also projected that up to 22 billion USD will flow into Nigeria in 2017 through diaspora remittances. The European Union (2016) stated that more than 10 million Nigerians which represents more than 5% of the country's population were living abroad of which almost 50% of them were in Sub-Saharan Africa. The World Bank (2018) report has shown that remittances by Nigerians in the diaspora rose steadily in the last 13 years and recorded the highest at 71.3% in 2018 and the remittance to Nigeria rose by 11.2 percent in 2021 to \$19.5bn from \$17.21bn recorded in 2020, the remittances estimated to hit \$20.9bn by the end of 2022 this represents a 75% increase from the prior year 2021.

However, the roles of remittances in promoting financial sector development has received considerate attention in both theoretical and empirical literature (Gupta, Pattillo & Wagh, 2009; Aggarwal, Demirgüç-Kunt & Peria, 2011; Sibindi, 2014; Akkoyunlu, 2015; Fromentin, 2017; Attila, Bangake, Eggoh & Semedo, 2018; Misati, Kamau, & Nassir, 2019). Scholars have argued that remittance inflows tend to boost demand for financial services and consequently financial sector development. This notion is built on the premise that remittances encourage recipients to demand and gain access to financial products and services which they would not have otherwise (Orozco & Rouse, 2013; Olowa & Olowa, 2015). Thus, remittances encourage the recipients to use formal banking services for the transfer of funds and other financial services. Two, it is also assumed that remittance inflows enable the financial sector to reach the unbanked recipients or recipients with limited financial intermediation. Thus, it promotes financial inclusion activities in developing countries (Agarwal & Horowitz, 2002; Olowa & Olowa, 2015). Three, since remittances usually involve large amounts, it is postulated that recipients often need financial products that will enable them to save such funds for future consumption as well as gain some amount of interest earnings from these savings (Aggarwal et al., 2010). This implies that remittance inflows could be a strong determinant of financial development.

Migrant remittances may lead to financial sector development in developing economies by increasing their aggregate volume of deposits and credit intermediated by the banking sector (Fromentin, 2017). At the same time, providing remittance transfer services allows banks to know and reach out to unbanked recipients or recipients with limited financial intermediation (Cooray, 2012; Adams & Page 2005; Chowdhury, 2011; Gupta et al., 2009; Imai et al., 2014; Chowdhury, 2016; Williams, 2017; Bangake & Eggoh, 2020).

By and large, remittances alone may not lead to desired growth, except trade openness is brought in to improve the impact of remittances on financial development. The relationship between remittances, trade openness, and financial development is complex and multifaceted. When remittances are combined with trade openness, they can have an even greater impact on financial development. For example, remittances can be used to finance investment in infrastructure or other development projects that improve a country's trade competitiveness. In addition, trade openness can help to attract more investment from migrant workers and their families, further boosting economic development.(Kumar, 2011; Pandikasala, Vyas, & Mani, 2022).

Therefore, this study introduces important variables that the previous literature on remittances and financial sector development has failed to capture, particularly in Nigeria. Such variables include total population and trade openness, which are crucial for financial development. For instance, a well-educated population is of utmost importance for the well-functioning of the financial system (Elsherif, 2015).

In addition, this study employs the more recent technique of data analysis i.e. ARDL model and Toda Yamamoto causality in order to sidestep other techniques of estimation employed by most of the studies in Nigeria (see Oke, Uadiale, & Okpala, 2011; Oluwafemi, & Ayandibu, 2014; Kumar, 2019). The objective of this study is to examine the impact of remittances, trade openness on financial sector development in Nigeria. Thus, the specific objectives of the study are:

- i. To examine the extent to which remittances impact financial sector development in Nigeria.
- ii. To investigate the interaction effect of remittances and trade openness on financial sector development in Nigeria.
- iii. To explore the causal relationship between remittances, trade openness and financial sector development in Nigeria.

LITERATURE REVIEW

Theoretical Literature

The linkage between remittances and financial development can be theoretically established on the theories of Altruism and the Portfolio approach.

Theory of Altruism

Becker (1976) who propagated the theory of altruism pointed out that the decision to remit is based on the income needs of the relatives of the emigrant worker. Emigrant workers send money to their relatives in their country of origin in order to improve their welfare. There is no expectation of reciprocation on the part of the migrant worker. The migrant worker remits the money because his utility is derived from that of his family members (Fullenkamp et., al. 2008).

Portfolio Approach Theory

According to Markowitz (1952), remittances are viewed as a strategy by an emigrant worker to diversify his or her savings. Accordingly, the decision to remit is based on the risk-return differential of assets in both the host and recipient countries. As such, the main determinants of the decision to remit include interest rate differential on deposit accounts in the host and recipient

country, real estate return, and inflation rate among others. Apart from these economic determinants, the desire to invest may also be driven by the desire of the emigrant worker to return home with dignity if the emigrant worker chooses to return home (Schleicher, 2006).

Empirical Literature on Remittances and Financial Sector Development

Various studies have investigated the effect of remittances on financial sector development. However, most of these studies employed a different method of analysis including Ordinary Least Square, Cointegration, Vector Error Correction Model, Pooled OLS, Generalized Method of Moment, and ARDL (see Ambrosius & Cuecuecha, 2016; Chowdhury, 2011; Cooray, 2012; Oluwa & Oluwa, 2015; Hussaini, Ibrahim & Muhammad, 2021).

Fromentin (2017) investigated the long-run and short-run impact of remittances on financial sector development in developing countries, using panel unbalanced data sets. The autoregressive distributed lag (ARDL) technique was used. The result shows a positive long-run relationship between remittances and financial development in countries.

In the same vein, Williams (2016) used 5-year non-overlapping unbalanced panel data from 1970 to 2013 to study the effect of remittances on financial development in sub-Saharan Africa (SSA), using the Generalised method of moment (GMM) technique. The empirical evidence showed that remittances are an important source of financial development in SSA.

Karikari, Mensah, and Harvey (2016) used panel data from 50 developing countries in Africa from 1990 to 2011 to explore whether remittances promote financial development in Africa or not. The study uses fixed effect and random effect estimations techniques as well as the Vector error correction model (VECM). The study concludes that remittances promote financial sector development in the short run and the development of the financial sector helps increase the propensity to remit through formal channels.

Also, Coulibaly (2015) explored the causality between remittances and financial sector development in Sub-Saharan African (SSA) countries, using annual data from 1980 to 2010. The research employed the Panel Granger causality testing approach that is based on a seemingly unrelated regression (SUR) multivariate system and Wald tests with country-specific bootstrap critical value. The study revealed that remittances positively influence financial development in SSA countries.

Waheed and Ayodele (2015) used time series data from 1977 to 2010 and examine the effects of remittances on financial sector development in Nigeria, employing both Ordinary least square (OLS) estimation techniques. The results indicated that remittances positively and significantly influence financial development in Nigeria.

Similarly, Cooray (2012) conducted a study on migrant remittances, financial sector development, and government ownership of banks within the OECD economies. The research utilized annual data from 1990 to 2010 across 94 countries and employed pooled OLS and system GMM methods to assess the impact of remittances on the financial sector. The OLS estimation results revealed that migrant remittances had a significant positive effect on financial sector

development in OECD countries, with a 1% increase in remittances corresponding to a 0.03% increase in bank deposits. Additionally, the study found that a 1% rise in remittances led to a 0.03% increase in private credit to GDP. The GMM estimation results were consistent with those obtained through OLS estimation, suggesting that remittances positively influenced the finances of the countries studied.

Furthermore, Lodigiani and Vermuelen (2011) conducted their research on remittances and financial openness using panel data from 66 developing countries from 1980-2005 empirically the study used ordered and two-stage least square to deal with the endogeneity of remittances and potential measurement error. The study found a strong positive and significant effect of remittances on financial openness.

Chowdhury (2011) used time series data from 1971 to 2008 to explore remittance flow and financial development in Bangladesh. The study employed the Johansen co-integration and Vector error correction model (VECM). The results revealed that; remittances have a positive significant effect on financial development. However, financial sector development is neutral in its effects on the inflow of remittances. Also, Oluwa and Oluwa (2015) conducted a study in Nigeria to investigate the relationship between migrants' remittances and financial sector development. The research utilized time series data spanning from 1977 to 2010 and focused on the impact of remittances on the aggregate level of deposits and credit intermediated by the local banking sector. The study employed Ordinary Least Squares (OLS) and Generalized Method of Moments (GMM) as estimation techniques. Two indicators of financial development, namely FINDEPTH (money supply to GDP ratio) and PRIVY (credit to the private sector to GDP ratio), were utilized. The findings revealed a positive, significant, and robust connection between remittances and financial development in Nigeria.

Likewise, Oke et al. (2011) conducted a study in Nigeria to analyze the impact of workers' remittances on financial development. The research utilized time series econometric techniques and focused on the relationship between remittances and financial development in Nigeria from 1977 to 2009. The study employed the ordinary least square estimation (OLSE) technique and the generalized method of moments (GMM) estimation. Two indicators of financial development were utilized. The regression results indicated that remittances had a positive and significant effect on financial development in Nigeria, as evidenced by both the money supply to GDP ratio and the credit to the private sector to GDP ratio.

Existing literature reviews on the impact of remittances on financial sector development in Nigeria have primarily utilized VECM and OLS as their analytical methods (Olufem et al., 2011; Oluwa & Oluwa, 2013; Waheed & Ayodele, 2015). However, these studies only cover data up to 2011 and have certain limitations. OLS and VECM are inadequate when dealing with variables of both $I(0)$ and $I(1)$ nature, and their effectiveness diminishes with small sample sizes. Therefore, there is a compelling need to employ the ARDL method in this study. The proposed methodology will use the more robust Autoregressive

Distributed Lag (ARDL) technique to investigate the short-run and long-run relationships between the variables. Previous research has produced mixed results, with some studies indicating a positive impact of remittances on financial development, others suggesting a negative relationship, and a few finding no significant relationships between the variables.

METHODOLOGY

Theoretical Framework

This study adopts the portfolio theory approach coined by Markowitz (1952). In the Portfolio approach theory, remittances are viewed as a strategy by an emigrant worker to diversify his or her savings. The theory has the following assumptions, the desire to remit is based on the risk-return differentials of assets in both host and recipient country, significant interest rate differential on the deposit account, the desire to remit is purely motivated by investment opportunities and the relationship between private investment and remittances is positive since remittances are principally spent on investment activities.

Based on the theory, we assumed that the financial sector development has the following function:

$$FINDV = F(REMTS) \dots\dots\dots 3.1$$

Where FINDV means financial development and REMTS is remittances. Eq. 3.1 was transformed as:

$$[FINDV]_{t-1} = \beta_1 + \beta_2 [REMTS]_{t-1} \dots\dots\dots 3.2$$

Therefore, equation 3.2 revealed that financial development depends on remittances, for this study we follow the work of Barua (2007), and this equation was modified to include other variables of interest. For instance, scholars have argued that remittances have an impact on credit to the private sector as a percentage of GDP (Karikari et al., 2016; Waheed & Ayodele, 2015). In addition, credit to the private sector was used in many empirical studies as a measure of financial sector development. Hence, financial development was substituted with credit to the private sector (CPSGD), thus the equation is specified as follows:

$$[CPSGD]_{t-1} = \beta_1 + \beta_2 [REMT]_{t-1} + \mu_t \dots\dots\dots 3.3$$

Also, the deposit interest rate (DPIRR) is very significant in determining credit to the private sector. Chowdhury (2011) argued that the deposit interest rate has a lasting impact on financial sector development.

Furthermore, total reserves of gold (TRSVG) also is an important determinant of financial sector development. Takyi and Obeng (2013) argued that a negative relationship between total reserves and financial sector development could be expected. In addition, it has been argued that population (TPOP) can influence financial sector development.

Given that the variables mentioned above are theoretically linked with remittances, therefore, they are included in the remittance models. Therefore, the general framework of the study is presented below:

$$[CPSGD]_t = F([REMTS]_t, [DPIRR]_t, [TRSVG]_t, [TPOP]_t, [TROP]_t) \dots \dots \dots 3.4$$

Where CPSGD is the credit to the private sector as a percentage of GDP, REMTS is personal remittances received, DPIRR is the deposit interest rate, TRSVG is a total reserve, TPOP is the total population and TROP is trade openness.

Model Specification

Having established the theoretical framework, the general model of credit to the private sector (CPSGD) including variable of interest along with other important determinants of financial sector development such as REMTS, DPIRR, TRSVG, TPOP, and TROP is specified as follows:

$$CPSGD_t = \beta_1 + \beta_2 \ln REMTS_t + \beta_3 DPIRR_t + \beta_4 \ln TRSVG_t + \beta_5 \ln TPOP_t + \beta_6 \ln TROP_t + \mu_t \dots \dots \dots 3.5$$

The name of the variables remain the same.

The ARDL Approach to Cointegration

This study adopts the bounds-testing approach to cointegration based on Autoregressive Distributed Lag (ARDL) model framework, as proposed by Pesaran, Shin, and Smith (2001). The uniqueness of the ARDL approach compared to other cointegration approaches is that the ARDL does not impose restrictions on the integration order of the variables being all I(1). Consequently, the ARDL can be applied regardless of whether the variables are all I(0), I(1), or mutually cointegrated (Pesaran et al., 2001). The ARDL approach involves the estimation of a restricted error correction (EC) version of the ARDL model.

The ARDL model is therefore specified as:

$$\begin{aligned} \Delta(CPSGD)_t = & a_0 + a_1 \ln(CPSGD)_{t-1} + a_2 \ln(REMTS)_{t-1} + a_3 (DPIRR)_{t-1} \\ & + a_4 \ln(TRSVG)_{t-1} + a_5 \ln(TPOP)_{t-1} + a_6 \ln(TROP)_{t-1} \\ & + \sum_{i=1}^h \beta_1 \Delta(CPSGD)_{t-i} + \sum_{i=0}^o \beta_2 \Delta \ln(REMTS)_{t-i} + \sum_{i=0}^j \beta_3 \Delta(DPIRR)_{t-i} \\ & + \sum_{i=1}^q \beta_4 \Delta \ln(TRSVG)_{t-i} + \sum_{i=0}^k \beta_5 \Delta \ln(TPOP)_{t-i} \\ & + \sum_{i=0}^l \beta_6 \Delta \ln(TROP)_{t-i} + \mu_t \dots \dots \dots 3.6 \end{aligned}$$

The meaning of variables remains constant, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are short-run parameters estimated, Δ denotes differencing, $\ln$ means logarithm, and h, o, j, q, k, l are the optimal lag length.

To get the short-run coefficients, an error correction model (ECM) is estimated. The ARDL specification of the ECM is represented in Equation (3.7) below.

$$\begin{aligned}\Delta(CPSGD)_t = & \sum_{i=1}^h \beta_1 \Delta(CPSGD)_{t-i} + \sum_{i=0}^o \beta_2 \Delta \ln(REMTS)_{t-i} + \sum_{i=0}^j \beta_3 \Delta(DPIRR)_{t-i} \\ & + \sum_{i=0}^q \beta_4 \Delta \ln(TRSVG)_{t-i} + \sum_{i=0}^k \beta_5 \Delta \ln(TPOP)_{t-i} \\ & + \sum_{i=0}^l \beta_6 \Delta \ln(TROP)_{t-i} + \mu_t \dots \dots 3.7\end{aligned}$$

The error correction mechanism (ECM) first used by Sargan and later popularized by Engle and Granger (1987) corrects for disequilibrium. An important theorem, known as the Granger representation theorem, states that if two variables Y and X are cointegrated, then the relationship between the two can be expressed as ECM (Gujarati, 2003).

Toda Yamamoto Causality

If the series are integrated of the same order, then Engle and Granger (1987), Johansen (1988), or Johansen and Juselius (1990) tests for causality are valid. However, since the variables are a combination of I(1) and I(0), the study used Toda Yamamoto's (1995) causality test to examine the impact of Remittances on financial sector development.

To test for Toda-Yamamoto causality between remittances and financial sector development (credit to the private sector) the following bivariate VAR (k) model is specified:

$$\begin{aligned}\Delta CPSGD_t = & \omega_x + \sum_{i=1}^{k+m} \epsilon_x \Delta CPSGD)_{t_{t-1}} + \sum_{i=1}^{k+m} \tau_x \Delta LREMTS_{t-1} + \mu_{tx} \\ \Delta REMTS_t = & \omega_y + \sum_{i=1}^{k+m} \epsilon_y \Delta REMTS_{t-1} + \sum_{i=1}^{k+m} \tau_y \Delta CPSGD)_{t_{t-1}} + \mu_{ty} \\ \Delta TROP_t = & \omega_y + \sum_{i=1}^{k+m} \epsilon_y \Delta TROP_{t-1} + \sum_{i=1}^{k+m} \tau_y \Delta CPSGD)_{t_{t-1}} + \mu_{ty}\end{aligned}$$

In equation and, Δ is the first-difference operator, k is the maximum order of integration, m is the optimal lag length, ω_x and ω_y are the intercepts (constants), ϵ_x and ϵ_y are the coefficients. The decision criteria for Toda Yamamoto causality is that, if there is unidirectional causality from CPSGD to LREMTS the estimated coefficient of the CPSGD must be statistically significant, while the estimated coefficient of the LREMTS is not statistically significant and vice versa. Also, bi-directional causality is expected when the CPSGD and LREMTS coefficients are statistically significant. Finally, Independence causality is suggested when the CPSGS and LREMTS coefficients are not statistically significant. TROP to CPSGD.

Source of Data

The study used secondary data which was obtained from World Development Indicators (WDI), all the data for variables remittances (REMTS), domestic credit % of GDP (CPSGD), domestic interest rate (DPIRR), total reserves, (TPOP) total population and (TROP) trade openness are sourced from (WDI, 2022).

RESULT AND DISCUSSION

Descriptive Statistics

Table 1. Descriptive Statistics of the Variables					
	CPSGD	REMTS	DPIRR	TROP	TPOP
Mean	10.128	8.250	12.085	14.045	35.345
Median	8.242	1.260	12.339	13.087	36.540
Maximum	22.289	2.250	23.242	22.811	53.278
Minimum	4.958	2.200	5.693	3.887	9.136
Std. Dev.	4.452	9.490	3.906	4.756	10.627
Observations	49	49	49	49	49

Source: Author's Computation (2022)

The summary of descriptive statistics was reported in Table 4.1. The results show that the average (mean) value of broad money % of GDP is 10.129%. The maximum value of domestic credit in a year is 22.289%, while the minimum value is 4.958% received in a year. This indicated that domestic credit plays a significant role in financial sector development. The contribution of remittance in a year is \$ 8.250 billion on average. The minimum and maximum values were \$150 million and \$2.4 million, respectively. The mean value of the deposit interest rate is 76.63, the maximum value of deposit interest is 157.5, and the minimum value is 1.75 while the latter has maximum and minimum values of 134.92 and 0.88 respectively.

Unit Root Test Results for ADF and PP

Table 2. Results of the Unit Root					
Variables	Level		First Difference		Status
	ADF	PP	ADF	PP	
CPSG	-2.136	-1.232	-5.068***	-4.951***	I(1)
LREMT	-1.687	-2.149	-4.330***	-8.828***	I(1)
DIR	-1.337	-2.743	-4.048***	-7.046***	I(1)
LTRSVG	-1.200	-1.061	-5.104***	-7.374***	I(1)
TPOP	-3.411**	-3.411**			I(0)
TROP	-3.393**	-3.289**			I(0)

Source: Author's Computation (2022)

Note: *** and ** indicated statistically significant at 1%, and 5% respectively.

The results of the unit root presented in Table 4.3 indicated that domestic credit to the private sector, remittances, domestic interest rate, and total reserves have unit roots at level, which means they are not stationary at level, but stationarity was found after taking the first difference. Therefore, the variables are integrated into order one $I(1)$. However, total population, inflation, and import of goods and services are stationary at this level. Therefore, the variables are found to be integrated of order zero $I(0)$. In summary, the variables of interest have mixed order of integration. The mixed order of integration among these variables provides a vital justification for the adoption of the Autoregressive distributed lag ARDL approach for this study.

Results of cointegration (ARDL)

Table 3. Results of Bounds Test Cointegration

Dependent variables						F Statistic
CPSGD						32.5662***
Critical Value Bound						
10%		5%		1%		
$I(0)$	$I(1)$	$I(0)$	$I(1)$	$I(0)$	$I(1)$	
1.992.94		2.273.28		2.883.99		

Source: Autor's Calculation. *** Denotes Statistical Significance at a 1% Level

Since the stationarity status has been established, ARDL bound test for cointegration was employed to check for the presence of a long-run relationship among the variables. The results presented in Table 4.3 shows that the computed F statistic (9.613782) is greater than the upper bound critical value (32.5662) $I(1)$ at a 1% level. This finding suggests the presence of a long-run relationship between BM_GDP, LREMTS, GDPPD, RIRR, and TROP. Having established the long-run relationship between the variables, the next step is to estimate the long-run as well as short-run/ECM coefficient of the optimum model of the study.

Results of Selected Long Run and Short Run Model

Having confirmed the long-run relationship between the variables, the ARDL model was estimated. The long-run and short-run coefficients for the estimated optimum model as chosen by Akaike information criteria are presented in Table 4.4. which is divided into panels A and B. Panel A contains the long-run coefficients whereas panel B contains the short-run/ECM coefficients. The results in panel A show the coefficient of remittances is positive and statistically significant at a 1 percent significance level in the long run. This means that increases in remittances have the potential of stimulating financial development in Nigeria. A 1% increase in remittances leads to a 2.76% increase in CPSGD in the long run, While in the short run, remittances have a positive and significant effect on CPSGD at a 1% level. A 1% increase in remittances leads to a 1.05% increase in CPSGD. This finding is in line with the works of Kakhkhar (2015), Coulibal, (2015), and Waheed and Ayodele (2015).

Table 4. Results of Short Run and Long Run ARDL Model

Panel A long run coefficients dependent variable is CPSGD				
Regressors	Coefficient	Standard error	T ratio	Probability
LREMTS	2.757	0.460	5.994	0.000
GDPPG	-0.063	0.118	-0.538	0.598
RIRR	-0.000	0.000	-1.146	0.268
TPOP	-0.723	0.946	-0.765	0.055
TROP	-1.505	0.628	-2.398	0.028
C	44.752	6.595	6.786	0.000
Panel B short run coefficients dependent variable is CPSGD				
Δ LREMTS	1.054	0.251	4.202	0.001
Δ LREMTS-1	-1.762	0.296	-5.958	0.000
Δ LREMTS-2	-0.947	0.268	-3.536	0.003
Δ DPIRR	0.243	0.076	3.212	0.005
Δ DPIRR-1	0.249	0.086	2.898	0.010
Δ DPIRR-2	0.524	0.101	5.196	0.000
Δ TRSVG	-0.000	0.000	-1.334	0.199
Δ TPOP	-3.435	0.863	-3.979	0.001
Δ TROP-1	-0.915	0.739	-1.237	0.233
CointEq-1	-1.058	0.156	-6.776	0.000

Source: Author's Computation (2022)

Δ is the first difference operator. Moreover, the results indicated that the deposit interest rate has a positive and significant effect on CPSGD at a 1% level in the short run. A 1% increase in deposit interest rate leads to a 0.24% increase in CPSGD in the short run. The findings are consistent with the results of previous studies (Adnan et al., 2017; Lopez et al., 2017; Tuuli, 2015).

Furthermore, the total population has a negative and significant impact on CPSG at a 1% level in the short run, also the variable has a negative and significant impact on CPSGD at 1% in the short run. A 1% increase in total population leads to a 3.44% decrease in CPSGD in the long run, while in the short run, it leads to a 0.72% decrease in CPSGD. The finding lends support to the previous studies (Varoosé & D'Espallier, 2009).

Moreover, trade openness as a percentage of GDP has a negative relationship with CPSGD at 1% both in the long run and short run, respectively. A 1% increase in TROP leads to a 0.92% decrease in the long run and a 1.51% decrease in the short run. The results are consistent with the previous studies (Elsharif, 2015).

The equilibrium correction coefficient takes the value of 1.05 and also is highly significant, thus having the correct sign and implying a very high speed of adjustment to equilibrium after a shock. About 105 % of disequilibria from the previous year's shock converge back to the long-run equilibrium in the current year. Banerjee, Dolado, and Mestre (1998) state that a highly significant error-correction term is further proof of the existence of a stable long-term relationship.

Results of Residual Diagnostic Tests

There are three tests conducted in this regard Breusch-Pagan test for serial autocorrelation which is conducted to establish whether the residual of the estimated model of the study is serially uncorrelated or not. The second test, the Breusch-Pagan-Godfrey test is performed to investigate whether the residuals are homoscedastic or not. Third is the Jarque-Berra test which is carried out to establish if the residuals are normally distributed or not. The results of these tests are reported in Table 5.

Table 5. Results of Diagnostic Tests	
Test	Test Statistic
Heteroscedasticity	0.879 [0.784]
Serial correlation	0.905 [0.815]
Normality: Jarque-Berra	1.801 [0.406]
Ramsey Reset Test.	1000

Source: Author's Computation (2022)

The table shows that Breusch-Godfrey serial correlation LM test shows that the residuals are not serially correlated because the Chi-square of the observed R-square and its associated p-value are statistically insignificant this shows that the residuals or the error terms are not serially auto-correlated. Moreover, the observed R-square and its p-value of the Breusch-Pagan-Godfrey test for heteroscedasticity turned out to be statistically insignificant which suggest the acceptance of the null hypothesis of homoscedasticity in the residuals, in other words, the residuals are homoscedastic. In addition, the F-statistic and its p-value for the Jarque-Berra test for normality were found to be statistically insignificant, hence the acceptance of the null hypothesis of normality in the residuals.

Results of Toda Yamamoto Causality Test

The presence of cointegration among the variables does not show the direction of causality between them, hence this justifies examining the existence of a causal relationship between the variables using Toda Yamamoto's (1995) approach to causality. The summary of the results of the Toda Yamamoto causality test is presented in Table 6.

Table 6. Results of Toda Yamamoto Causality

Null hypothesis	Df	MWALID	Prob	Decision	Direction causality
CPSGD→LREMT	2	21.826	0.000	Reject	Unidirectional
LREMT→CPSGD	2	2.332	0.312	Do not reject	No causality
CPSGD →DPIRR	2	0.006	0.937	Do not reject	No causality
DPIRR→ CPSGD	2	1.980	0.996	Do not reject	No causality
CPSGD →TPOP	2	15.184	0.005	Reject	Unidirectional
TPOP→ CPSGD	2	8.389	0.015	Reject	Unidirectional
CPSGD →TROP	2	0.001	0.991	Do not reject	No causality
TROP→ CPSGD	2	0.087	0.768	Do not reject	No causality

Source: Author's Computation (2022)

Note: → denotes 'does not Granger cause'; Df indicates the degree of freedom and MWALD is the modified Wald chi-square of the Toda-Yamamoto (1995) causality test.

The table shows that there is a unidirectional causality running from CPSGD to remittances (LREMT) and unidirectional causality from domestic credit to the private sector (CPSGD) to total reserves (DPIRR) in Nigeria. The results of the remaining variables indicate that there is no causality among the variables.

CONCLUSIONS AND RECOMMENDATIONS

Given the foregoing findings, this study makes the following recommendations. First, having established that remittances inhibit financial sector development, the government should employ policies that will encourage channelling remittances through a formal banking system. As well as ensuring that such remittances received are channelled to finance productive investment hence financial development.

In addition, policymakers may through financial inclusion measures consider providing financial services and products to rural areas as a way to facilitate and reduce transaction costs associated with receiving remittances. Doing so will inculcate banking habits among the rural dwellers, and ensure that remittances received form part of making them important sources of loanable funds to investors or entrepreneurs in the country.

From the results, it was established that there exists a negative relationship between real interest rates and financial sector development. This implies that policymakers should ensure the maintenance of positive real interest rates to encourage more saving deposits, and more loanable funds in the financial sector. The growth rate of Gross capital formation was found to have a positive impact on financial sector development and this implies that policies should be designed that boost the growth rate of gross capital formation which will enhance the performance of Nigeria's financial sector development. Lastly, the study found a

positive relationship between trade openness and financial sector development, this demonstrates the importance of trade openness in promoting financial sector development, hence the need to implement policies that will support more trade openness as a financier of promoting financial sector development in Nigeria

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