EFFECT OF REMITTANCE AND EXPORT DIVERSITY ON FINANCIAL DEVELOPMENT IN NIGERIA

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ABSTRACT

This study examines the effect of remittance and export diversity on financial development in Nigeria. Employing the Autoregressive Distributed Lag (ARDL) bound testing approach, the findings reveal significant long-term co-integration among these variables, suggesting they exhibit a synchronous movement over time. The Error Correction Model (ECM) indicates that approximately 70.5% of deviations from the long-term equilibrium are rectified in the subsequent period, highlighting a robust adjustment mechanism toward equilibrium. The long-term analysis shows a positive and significant impact of RI on FD, whereas INF negatively affects FD. Notably, RO, EXPD, and GE demonstrate no significant long-term influence on FD. In the short term, GDP, INF, and GE significantly impact FD, underlining their relevance in shaping financial development trends. Diagnostic assessments confirm the absence of serial correlation and heteroskedasticity, reinforcing the reliability of the model. Based on these insights, the study recommends that government and financial institutions foster the use of formal remittance channels to decrease transaction costs and enhance exchange rates, implement tracking systems for remittance outflows to support financial development goals, and diversify Nigeria's export base by investing in agriculture, manufacturing, and technology sectors to reduce reliance on oil exports.

Keywords: *effect, remittance, export diversity, financial and development*

Introduction

Financial development is crucial for economic growth and stability, as highlighted by prior studies, such as Farouq and Sulong (2020); Gyamfi et al. (2023). Levine (2005); Nanyiti and Seruyange (2022). Financial systems channel resources from savers to investors, manage risk and facilitate exchanges. Key factors influencing financial development need to be understood. A well-developed financial sector ensures efficient capital allocation, mobilizes savings, promotes investment, and enhances productivity and economic growth. Financial institutions also aid in risk mitigation, foster entrepreneurship, and improve market liquidity (Afolabi, 2022). Remittances, which are money transfers made by immigrants to their home countries, have become a significant source of external finance for many developing countries.

They play a crucial role in financing productive investments and stabilizing consumption after economic shocks. Remittances are now the second-largest source of external financing, following foreign direct investment, and are considered more stable than other overseas flows (W orld Bank 2022). Africa is one of the most poverty-stricken continents globally (Gyamfi et al., 2023). Policymakers aim to align policy measures with the continent's growth agenda. Despite the increasing number of African migrants worldwide, the impact of remittance inflows on Africa's financial development is not well understood (Adekunle et al., 2020).

Nigeria, rich in human capital and natural resources, is a key player in Africa and the global economy (World Bank 2022). The Nigerian economy is notably influenced by remittances and export diversity. Remittances have become a major financial inflow for developing countries like Nigeria, often surpassing foreign direct investment (World Bank, 2020). Nigeria is among the top global recipients of remittances due to its large diaspora. Export diversity also plays a crucial role in financial development by reducing vulnerability to external shocks and promoting economic stability (Agosin, 2007). Countries with diversified exports are less affected by global commodity price fluctuations, which enhances financial robustness (Hesse, 2008). This diversification supports a broader range of financial services and products, fostering innovation and deepening financial markets. Recent trends indicate that countries with diverse exports have better economic resilience and growth prospects, challenging traditional economic theories that favor specialization (Cadot et al., 2011). For Nigeria, traditionally reliant on oil exports, diversifying its export base is essential for sustainable financial development.

Despite the growing literature on remittances, there is a lack of studies explaining the structural changes in financial development in Nigeria and Africa due to remittances inflow. Only a few studies, including Adekunle et al. (2020), empirically provided the relationship between remittances and financial development in Africa. Much of the existing literature treats remittances and financial development in isolation or focuses on broader country samples, overlooking specific dynamics. Nigeria, Africa's most populous nation and a major economy with significant oil exports and increasing remittance flows (World Bank, 2020), is a unique case study. Analyzing how remittances and export diversity influence Nigeria's financial development is essential for nuanced policy recommendations. Understanding the nexus between remittance inflows, export diversity, and financial development is imperative for Nigeria. This research aimed to investigate this relationship, providing empirical evidence e from Nigeria's context, helping policymakers harness these aspects for a well-rounded financial development strategy.

Problem Statement

In recent years, Nigeria's economy has remained heavily export-dependent, with efforts underway to diversify beyond oil. Scholars have noted a shift in the composition of Nigerian exports, which has prompted growing interest in how export diversity may influence financial development (Ismail & Abdullah, 2020; Aliyu & Eng, 2019). However, literature on the subject remains limited. Additionally, challenges like poor infrastructure and limited financing hinder Nigeria's industrial development, with foreign remittances often underutilized due to the absence of strategic frameworks for channeling them into productive sectors (Ubi et al., 2022; Adeagbo & Ayansola, 2022; Olayinka et al., 2022). Despite large inflows of remittances, the country struggles with poverty and inequality, as these funds are frequently spent on consumption rather than long-term investment (Mbaeri et al., 2023; Abduvaliev & Bustillo, 2020).

Over-reliance on oil responsible for over 90% of Nigeria's export earnings in 2020 has exposed the economy to external shocks, underlining the need for export diversification to stabilize financial markets and stimulate broader growth (NNPC, 2021; Cadot et al., 2020). Financial development, which includes improving financial institutions and markets, can benefit from such diversification by expanding the range of financial services available to emerging sectors (Ismail & Abdullah, 2020; Rajan & Zingales, 2022). However, a gap exists in the literature concerning the combined impact of export diversity and remittances on financial development in Nigeria. While both factors contribute individually to economic growth, their joint influence remains underexplored. To address this gap, recent studies propose using advanced econometric techniques like ARDL and ECM to investigate how remittances and export diversity together affect Nigeria's financial development, offering insights for formulating sustainable economic policies (Levine, 1997).

Hence, there is a need to clarify the relationship between remittances, and export diversity on financial development in Nigeria. Therefore, the present study addressed this by investigating the extent to which remittance (inflow and outflow) affects Nigeria's financial development within the Nigerian context. An empirical exploration of this relationship offered avenues for sustainable economic strategies and identify potential obstacles or opportunities intrinsic to the Nigerian economy.

Objective of the Study

The main objective of the study is to investigate the effect of remittance inflows and export diversity on the financial development of Nigeria. The specific objectives are as follows:

i. To examine the effects of remittance inflow on the financial development in Nigeria.

ii. To investigate the effects of remittance outflows on the financial development in Nigeria.

Research Hypothesis

The following are the research hypotheses developed by the study based on research questions and objectives.

$H_0$1. There is no significant effect of remittance inflow on the financial development in Nigeria.

H_O2. Remittance outflows do not have a significant effect on the financial development of Nigeria.

LITERATURE REVIEW

Financial Development

Financial development is the development of financial institutions, financial markets, and financial instruments (Uzonwanne, 2015). It involves funding entrepreneurial activity and innovations. Financial development means some improvements in producing information about possible investments and allocating capital, monitoring firms and exerting corporate governance, trading, diversification, and management of risk, mobilization and pooling of savings, and easing the exchange of goods and services (Adeola & Evans, 2017). These financial functions affect savings and investment decisions, technological innovations, and hence economic growth (Uzonwanne, 2015). According to Sarma and Paris (2008), the financial sector is the set of institutions, instruments, and markets, as well as the legal and regulatory framework that permits transactions to be made by extending credit. Fundamentally, financial sector development is about overcoming “costs” incurred in the financial system (Uzonwanne, 2015). This process of reducing the costs of acquiring information, enforcing contracts, and making transactions resulted in the emergence of financial contracts, markets, and intermediaries (Uzonwanne, 2015). Different types and combinations of information, enforcement, and transaction costs in conjunction with different legal, regulatory, and tax systems have motivated distinct financial contracts, markets, and intermediaries across countries and throughout history (Calderon & Liu, 2003).

Concept of Remittance

Remittance is the inflow of money that results from migration, migration in this study is the voluntary movement of a person from a country of origin to seek a more prosperous environment and or to ensure the safety of life. When migration is documented, it is termed regular, the reverse is termed irregular migration. The International Labour Organization ILO (2001) defined remittance as the portion of international migrants' workers' earnings sent back from the country of employment to the country of origin. Similarly, Adekunle et al. (2020) revealed that it is ideas, practices, identities, and social capital that flow as social remittances. In the same vein, Gyamfi et al. (2023) confers remittance in a broader perspective as a reflection of the monetary dimension in the complex web of linkages that exist between migrant Diasporas and their home countries. Remittances can be sub-classified into financial remittances, social remittances, and remittances-in-kind. Financial remittances are the inflow of cash and financial products. Cash is sent formally through the banks and network of International Monetary Transfer Organizations (MTOs) and also conveyed through informal channels. Financial remittances could also be in the form of Diaspora bond receipts that are designed by the home countries to attract funds from the Diasporas. The Diaspora provides social remittances to their local communities in the area of health, and education as well as the building of infrastructure through donations of funds. Social remittances also include the values and norms on which social capital is based for example social and political leaders can sometimes harness the status they acquire in the host country to advance their cause in the homeland.

Determinants of Remittance

Understanding the underlying motivation behind remitting is necessary for investigating the economic impact of remittances, for at least two reasons. First, the amount a migrant remit depends on the migrant's underlying reasons to migrate and reasons to remit in the first place. In turn, the size and timing of remittance flows determine their impact on economic activity in the home country. Second, the intended purposes of remittance also impact the end uses of these flows. The uses to which recipients put remittances are important determinants of their economic impact on home country as indicated by Abu-bader and Abu-Qaun, (2021). Afolabi (2022) believed that migrants send remittances simply because they care about the well-being of those left behind. This implies that there is a positive relationship between adverse conditions of the family left behind and the number of remittances sent by the migrant. Altruistic transfer should increase with the migrants' income and his degree of altruism and decrease with the recipient's income and the recipient' degree of altruism, Adeagbo and Anyasola (2022). The altruism motive is the most intuitive

and widespread presumption, the earliest studies on remittances, Adeola and Evans (2017) already mention altruistic motives for remitting. Again, remittance may be motivated by self-interested reasons; these self-interested theories of remittances view the family as a business or as a nexus of contracts that enables family members to enter in Pareto-improving exchanges (Chami et al., 2005).

Theoretical Review

Theoretical literature introduces and describes the theory that explains why the research problem under study exists. Thus, theories are formulated to explain, predict, and understand a particular phenomenon. Without theoretical literature, the structure and vision for a study is unclear, much like a house that cannot be constructed without a blueprint. Conversely, a study plan that contains theoretical literature allows the dissertation study to be strong and structured with an organized flow from one chapter to the next (Ravitch & Riggan, 2017). The current research would apply the following theories. Theories of Remittances and Growth Outcomes, and the Neo-Classical Economic Theory.

Neo-Classical Economic Theory.

Neo-Classical Economic Theory was developed in the late 19th and early 20th centuries by economists such as Alfred Marshall, Leon Walras, and Vilfredo Pareto. Alfred Marshall's "Principles of Economics" was particularly influential, emphasizing utility, supply and demand, and marginal analysis. This school of thought built on classical economics by incorporating mathematical models and a focus on individual behavior, and it remains influential today.

Theories of diaspora and migration are complex due to the varied reasons for migration and the diversity of events involved. Migration theories, like the Push-Pull model, explain migration through factors such as job opportunities (pull factors) and issues like insecurity and unemployment (push factors). The neo-classical economic theory views migration as driven by geographical differences in labor scarcity and income, supporting the "factor price equalization principle." The New Economics of Labor Migration (NELM) theory, a micro-level theory, posits that migration decisions in developing economies are often made at the household level, with remittances playing a key role in improving living conditions. However, this theory does not fully explain long-term global migration patterns and their broader developmental impacts.

The present study would rely on Neo-Classical Economic Theory as underpinning theory and to be complement by the Theories of Remittances and Growth Outcomes to explain the relationship between remittances, export diversification, and financial development is complex and multifaceted. Drawing on a neoclassical theory can provide a comprehensive framework for understanding how these factors interact

and influence economic outcomes. Neoclassical growth theory emphasizes the role of capital accumulation in economic growth. Remittances can be seen as a source of capital for recipient countries. This capital infusion can contribute to increased investment, leading to higher productivity and economic growth. Neoclassical theory suggests that export diversification can be a driver of economic growth by reducing dependence on a single sector. Remittances can support this process by providing additional income for investment in non-traditional sectors, fostering economic. Remittances can also be channeled through financial institutions to provide financing for export-oriented businesses, contributing to export diversification efforts.

Empirical Review

There are several prior researches conducted investigating the determinants of financial development both within and outside the Nigerian context. In this sub-section, researches were reviewed using a variable-by-variable basis so as to make this research work more encompassing.

Garba et al. (2020) investigated the role of the financial sector in the nexus between foreign remittances and economic growth in Nigeria over the period of 1981 to 2015. The study employed the two stages least squares (2SLS) technique. Contrary to earlier studies, the study found that the joint effect of foreign remittances and financial development on economic growth is complementary when quantitative indicators of financial development are used, while foreign remittances and financial development act as substitutes in enhancing economic growth when qualitative financial development measure is used. Falade et al. (2021) used the VECM technique to examine the interaction of financial development and remittances on economic growth in Nigeria during the period 1986-2019. The study found that the interaction of migrants' remittances and financial development enhances economic growth. Still on Nigeria's economy, Similarly, Mehta et al. (2021) investigate on the role of remittances in financial development: Evidence from Nonlinear ARDL and Asymmetric Causality. This study’s impetus is to explore fresh evidence to answer the question, i.e., whether remittances asymmetrically influence financial development in Bangladesh from 1975 to 2019. The study employs several tests, i.e., nonlinear unit root test, Autoregressive Distributed Lagged (ARDL), NARDL, and asymmetric causality test for establishing the pattern of association. Nonlinear unit root tests confirm that variables follow a nonlinear system of being stationary after the first difference. nonlinearity among variables is investigated by performing the BDS test and nonlinear OLS. Directional causality is investigated through both linear and nonlinear effects of remittance inflows by following the non-granger casualty test. The test statistics of Fpass and tBDM showed the Long-run cointegration in the empirical

model and positive effect running from remittances inflow to financial development both in the long-run and short-run. Furthermore, the results of a standard Wald test divulge the presence of long-run and short-run asymmetry. Asymmetry causality test established unidirectional causality due to positive and negative shocks in remittances inflows to Bank-based financial development and feedback hypothesis hold for explaining causality between positive and negative shocks in remittance inflows and Stock-based financial development.

The research by Ibrahim and Sheriffdeen (2021) On the "Remittances and the future of African economies". African nations have in time, passed over-relied on remittances inflow to augment domestic finances needed for growth. Despite the volume and magnitude of remittances that have to serve as an alternative source of investment financing, African remains mostly underdeveloped. The altruistic motives of sending remittances to Africa are likely to fade with time. In this study, we argued that the altruistic connection that has been the bedrock of sending money to African countries would eventually fade when the older generation passes away. To lean empirical credence to this assertion, we examine the structural linkages and the channels through which remittances predicts variations in financial development as a threshold for gauging the future of African economies. We gathered panel data on indices of remittances and financial development for thirty (30) African countries from 2003 through 2017. We employed the dynamic panel system generalized method of moment (dynamic system GMM) estimation procedure to establish a baseline level relationship between the variables of interest. We adjusted for heterogeneity assumptions inherent in ordinary panel estimation and found a basis for the strict orthogonal relationship among the variables. Findings revealed that a percentage increase in remittances inflow has a short-run, positive relationship with financial development in Africa. The result further revealed that the exchange rate negatively influences financial development in Africa.

Olayinka et al. (2022) investigated on the research title "Do Remittance Inflows Drive Industrialization and Productivity? Evidence from Nigeria" This study specifically investigates the direct and indirect effect of remittance inflows on industrialization (measured with industrial output). In general, it examines whether remittance inflows drive industrialization in Nigeria. Annual time series data from World Bank's Development Indicators and Central Bank of Nigeria Statistical Bulletin 2015 were use. The autoregressive distributed lag model based on unconstrained error correction model (ARDLUECM) was employed in investigating the direct effect while the indirect effect was determined using the Restricted Vector

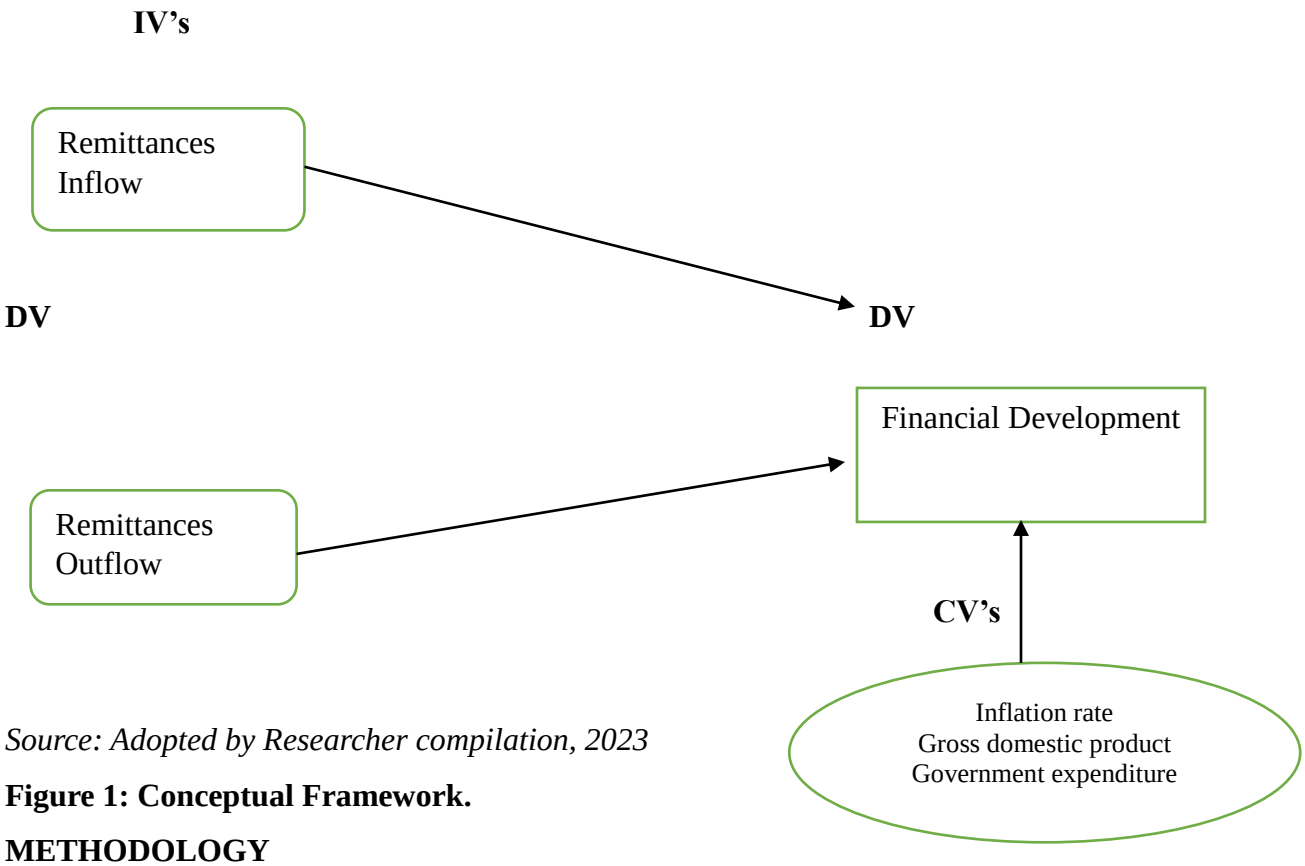
Autoregressive (VAR) model. Results from ARDL Model demonstrate that remittance inflows have significant positive effect on industrialization in the long runs but not in the short run.

Jemiluyi, and JekeHow, (2023) Study on "Catalytic Is Digital Technology in the Nexus between Migrants' Remittance and Financial Development in Sub-Saharan African Countries?" Given the indisputable roles of remittance and financial development in countries' economic performance, enhancing the nexus between the two variables has become pertinent. The remittance–financial development literature has surged, with a growing argument that making the relationship work is conditioned on mediating roles of certain economic indicators. Despite the overwhelming evidence of the transformative roles of digital technology, the assessment of its possible mediating role in the remittance–financial development nexus is lacking in the literature. Hence, using pooled data of 35 Sub-Saharan African (SSA) countries sourced from the World Bank's Development Indicators, this study examined the mediating effect of digital technology in the relationship between remittance inflows and financial development. Using two indicators of ICT, fixed broadband and mobile cellular subscription the results of the generalized method of moment analysis suggest that digital technology spurs remittance inflows to promote financial development in SSA.

Conceptual Framework

A conceptual framework is a diagrammatical representation of variables and how they relate. The conceptual framework depicts the association between the dependent Variable (i.e., Financial Development: Measured using the ratio of money supply to GDP and the ratio of domestic credit to the private sector to GDP) and independent variables (i.e., Remittances: Captured as a percentage of GDP, Export Diversity: Quantified using the Herfindahl-Hirschman Index (HHI) for exports). While the control variables considering possible confounding factors, variables such as inflation rate, interest rate, and GDP growth was controlled for in the model.

The framework is developed from the literature review discussed above and presented in the Figure 1 below.



Source: Adopted by Researcher compilation, 2023

Figure 1: Conceptual Framework.

METHODOLOGY

The study adopted an ex-post facto research design, with the aimed to critically assess the effect of remittance and export diversity on the financial development of Nigeria. As study adopted ex-post facto research design where secondary data was collected. Secondary data was necessary, by the fact that such data are readily available and easily accessible with less probability of inaccuracy. The data for the study was obtained from Central Bank of Nigeria (CBN), World Bank Databases, International Monetary Fund (IMF) Databases and Nigerian Bureau of Statistics. The study also considered a period from 2000 - 2022 to capture both short-term and long-term effects. The study variables constitute both dependent Variable (i.e., Financial Development: Measured using the ratio of money supply to GDP and the ratio of domestic credit to the private sector to GDP) and Independent Variables (i.e., Remittances: Captured as a percentage of GDP, Export Diversity: Quantified using the Herfindahl-Hirschman Index (HHI) for exports). While the control variables considering possible confounding factors, variables such as inflation rate and interest rate, were controlled for in the model.

Variables Definition and Measurements

Variable Name	Notation	Variable Measurement	Variable	Citation	Result/ Expect
Remittances inflows	RIF	It's the sum of worker's remittances, compensation of employees and migrants transfers as recorded in the IMF balance of payments. Sum of remittances divided by sum of GDP when remittances data are available.	Independent	Prempeh et al. (2023) and Azer, et al., (2021)	Positive
Remittances outflows	ROF	When migrants send money part of their earnings in the form of either cash or goods to support their families, these transfers are known as worker or migrant remittances.	Independent	Adams, and Page, (2003)	Positive
Ratio of money supply to GDP	RMS	NIL	Dependent	NIL	NIL
Ratio of domestic credit to the private sector to GDP	RDCPS	NIL	Dependent	NIL	NIL

Source: Researcher's design from literature

Method of Data Analysis

Unit Root Test

Financial and economic time series were observed to be non-stationary at levels. An attempt to regress a non-stationary series on another non stationary series leads to spurious regression (Yule 1926, Granger & Newbold 1974), a situation that causes wrong inference making. Thus, since correct inference will depend on statistical properties of the data, particularly stationarity, a unit root test was conducted on the time series (RIF, ROF, ED) using Augmented Dickey Fuller (ADF), KPSS (with a constant and time trend) and Zivot-Andrew test to achieve robustness for a sample period. Description statistics was used to provide a snapshot of the variable across the financial development while Autoregressive Distributed Lag (ARDL) will also employed to estimate time series relationship between remittance and to avoid multi-collinearity problems

when the explanatory variable are high correlated, it becomes difficult to disentangle the separate effects of each of the explanatory variable on the dependent variable and would lead to substantial increase in the standard errors of the co-efficient estimates of the export diversity indicator.

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The methodology of this study is designed to assess effects of remittance and export diversity on financial development: Evidence from Nigeria. This study, utilized the Autoregressive Distributed Lag (ARDL) approach to cointegration as outlined by (Persaran 1997) and (Pesaran & Shin 1998). The ARDL model has been chosen because it has numerous advantages. Firstly, it can be applied irrespective of whatever the individual regressors are integrated of the Order I (0) or I (1), regardless of stationarity. Secondly, the ARDL model takes sufficient number of lags to capture the data generating process from a general to specific modeling framework (Laurenceson & Chai, 2003). Thirdly, the ARDL approach yields superior estimates of long – run coefficient, and the diagnostic test of the estimated equation are more reliable. Fourthly, from ARDL model, one can derive a dynamic Error Correction Model (ECM) through a simple linear transformation (Banarjee, Galbraith, and Hendry: 1994). The ECM also help us to measure the short run relationship among the model's variable. The ARDL model is an economic technique used to explore the long – run relationships between variables. It accommodates both short term and long terms effects and is appropriate for analyzing the dynamic between remittance and export diversity indicators and financial development in Nigeria.

Model Specification

The model specification concerns with assessing the impact of remittance and export diversity on financial development in Nigeria. The study expressed as a function of central bank inflation rate, interest rate, and GDP growth.

The following model is specified to achieve the objectives of this study:

$$FD=\beta 0+\beta 1\times RI+\beta 2\times RO+\beta_3\times GDP+\beta_4\times INF+\beta 6\times GE+\varepsilon$$

Where**:**

FD = is the measure of financial development.

RI **=** is the remittance inflow as a proxy for the positive impact of remittances on financial development.

RO **=** is the remittance outflow as a proxy for the potential impact of sending migrants on financial development.

GDP **=** represents the economic growth.

***INF* =** is the inflation rate, which may influence financial development.

***GE* =** is government expenditure, accounting for the impact of fiscal policies.

β0= is the intercept term.

β1, β2… β3 = are the coefficients to be estimated.

ε = is the error term.

RESULT AND DISCUSSIONS

Descriptive Statistics

Table 1 summarizes descriptive statistics for the variables, providing information for their distribution over a sample of observations. For each variable, the number of observations (Obs), mean, standard deviation (Std. Dev.), minimum (Min), and maximum (Max) are presented. This helps in understanding the central tendency, variability, and range of the variables such as Financial Development (FD), Remittance inflows (RI), Remittance Outflows (RO), Export Diversity (EXPD), Gross Domestic Product (GDP), Inflation (INF), and Government Expenditure (GE).

Table 4.1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
FD	42	.1871585	.0335023	.123073	.2727251
RI	42	8.79e+09	9.83e+09	2424528	2.43e+10
RO	42	1.41e+08	2.23e+08	547300.1	1.04e+09
GDP	42	2.81e+11	1.55e+11	1.15e+11	5.51e+11
INF	42	18.43381	15.99676	5.388008	72.8355
GE	42	15.99925	4.93492	9.760705	30.85716

Source: Author Computation Using World Bank Data, 2024.

The descriptive statistics table in table 1, summarizes data for several variables, each with 42 observations. Financial Development (FD) has an average of 0.1872, with low variability (std. dev. 0.0335), and ranges from 0.1231 to 0.2727. Remittance Inflows (RI) averages approximately 8.79 with significant variability (std. dev. 9.83) and a range between about 2.4 and 24.3. Remittance Outflows (RO) has a mean of around 141, a standard deviation of 223, and varies between approximately 547,300 and 1.04. GDP (Gross Domestic Product) shows a mean of 281 with a large spread (std. dev. 155), ranging from 115 to 551. Inflation (INF) averages 18.43 with significant variability (std. dev. 15.99), between 5.39 and 72.84. Lastly, Government Expenditure (GE) includes 23 observations with an average of 16, variability of 4.93, and a range of 9.76 to 30.86.

Correlation Matrix

The table 2 presents the correlation coefficients among seven economic variables: Financial Development (FD), Remittance Inflows (RI), Remittance Outflows (RO), Export Diversity (EXPD), Gross Domestic Product (GDP), Inflation (INF), and Government Expenditure (GE). Each value indicates the strength and direction of the linear relationship between pairs of variables. Positive values represent direct correlations, while negative values signify inverse relationships.

Table 2: Correlation Matrix

Variables	FD	RI	RO	GDP	INF	GE
FD	1.0000					
RI	0.7122	1.0000				
RO	0.2132	0.2940	1.0000			
GDP	0.6444	0.8532	0.3604	1.0000		
INF	0.1393	-0.0637	-0.0545	0.2116	1.0000	
GE	-0.5902	-0.8193	-0.3676	-0.8106	-0.0056	1.0000

Source: Author Computation Using World Data, 2024.

The correlation matrix table 2, indicates that FD (Financial Development) exhibits a strong correlation with Remittance Inflows (RI) with and Gross Domestic Product (GDP) with a value of 0,7122 and 0.7405.. In contrast, Remittance outflows (RO) and Inflation (INF) shows a weak corralations with the other variables, implying that a non-linear relationship with the sample. Government Expenditure (GE) shows a consistence strong negative correlations with Remittance Inflows and Gross Domestic Product (GDP) with a values of -0.8193 and -0.8106 respectively.

Unit Root Test

The table 3 presents the results of the Augmented Dickey-Fuller (ADF) unit root test, used to determine whether a given time series is stationary or has a unit root, indicating non-stationarity. Each variable's test statistic, critical values at various significance levels, and the corresponding p-values are shown, allowing for assessment of the null hypothesis that a unit root is present. This analysis helps identify if differencing is needed to achieve stationarity for further time series modelling.

Table 4.3: Augmented Dickey Fuller Unit Root Test

Variables	First Difference	Second Difference	Decision Rule	REMARK
FD	-1.279	-3.179**	I(1)	Stationary
	(0.6387)	(0.0021)		
RI	-0.583	3.842**	I(1)	Stationary
	(0.8747)	(0.0065)		
RO	-3.143**	-3.341**	I(O)	Stationary
	(0.0235)	(0.0132)		
GDP	2.271	-3.517**	I(1)	Stationary
	(0.9989)	(0.0098)		
INF	-3.565**	-4.0228**	I(O)	Stationary
	(0.0065)	(0.0013)		
GE	-2.309	-4.360**	I(1)	Stationary
	(0.1690)	(0.0003)		

Source: Author's Computation Using Stata 5, 2024
Note: Square Brackets is the p-values (), ** is indicating statistical significance of the critical values at 5% level.
These are the keys for Decision Rule.
1(0) = stationary level
1(1) = stationary at list difference

The Augmented Dickey-Fuller (ADF) unit root test results indicate that most variables, including FD (Financial Development), RI (Remittance Inflow), GDP (Gross Domestic Product), and GE (Government Expenditure), are non-stationary at the level but become stationary at the first difference, making them I (1). This suggests they require differencing to achieve stationarity. In contrast, RO (Return on Outflow) and INF (Inflation) are already stationary at level (I (0)), with p-values of 0.0235 and 0.0065, respectively, showing no need for differencing. These results highlight that, except for RO and INF, most variables in the study are integrated of order one, indicating that first differencing is necessary for stationarity in further analyses.

Lag Length Selection Criteria

Table 4 presents the results of lag length selection criteria for a time series model, used to determine the optimal number of lags to include for the best model fit. Criteria for lag length selection include Log Likelihood (LL), Likelihood Ratio (LR) test, Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC), and Schwarz Bayesian Information Criterion (SBIC). These criteria help identify the lag that minimizes information loss and improves model performance.

Table 4: Lag Length Selection Criteria

Lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	-1435.86				8.4e+74	192.381	192.378	192.712
1	-1311.29	249.13	49	0.000	8.3e+70*	182.306*	182.278*	184.949*
2	1765.94	6154.5	49	0.000	.	-221.458	-221.511	-216.502
3	1831.58	131.28*	49	0.000	.	-230.210	-230.263	-225.254
4	1805.21	-52.738	49	.	.	-226.694	-226.747	-221.738

Source: Author's Computation Using Stata 15, 2024.

The lag length selection criteria in table 4, indicates that Lag 3 is the optimal choice for the time series model. This is supported by its lowest values for the Akaike Information Criterion (AIC at -230.21), Hannan-Quinn Information Criterion (HQIC at -230.263), and Schwarz Bayesian Information Criterion (SBIC at -225.254), signifying the best model fit. The likelihood ratio (LR) test for Lag 3 is 131.28 with a p-value of 0.000, indicating significant improvement over previous lags. Although Lag 1 and Lag 2 show notable model enhancements, Lag 3 provides the best fit overall, as Lag 4 does not yield further improvements. Thus, Lag 3 is chosen for its optimal combination of lower criteria values and model performance.

ARDL Bound Test for Cointegration

The findings of an ARDL bounds test that was performed to determine if LFD and the independent variables LRI, LRO, LEXPD, LGDP, INF, and LGE had a long-term cointegration relationship are shown in Table 5. At different levels of significance, the F-statistic is contrasted with critical values. This approach aids in determining whether there is a long-term equilibrium relationship between the variables.

Table 4.5: ARDL Bound Tests for Cointegration

Variables	**F-Statistics**	**Decision**
LFD = F (LRI, LRO, LEXPD, LGDP, INF, LGE)	4.184	long Cointegration
Critical Value	**Lower Bound**	**Upper Bound**
0.5%	3.15	4.43
1%	2.75	3.99
5%	2.45	3.61
10%	2.12	3.23

Source: Author's Computation Using Stata 15, 2024.

The ARDL bounds test result shows an F-statistic of 4.184, which exceeds the upper bound critical values at the 5% (3.61) and 1% (3.99) significance levels, and even the 0.5% level (4.43). This indicates that the null hypothesis of no cointegration is rejected, confirming the presence of a significant long-run relationship between the dependent variable LFD and the independent variables LRI, LRO, LEXPD, LGDP, INF, and LGE. Therefore, there is strong evidence that these variables are cointegrated, implying they move together in the long run.

ARDL Long Run and ECM Short Run Results

The long-run interpretation of the ARDL (1,1,1,1,1,1,1) regression in table 4.6 indicates that the error correction term for LFD is significant with a coefficient of -0.7047 (p = 0.003), showing that approximately 70.5% of deviations from the long-run equilibrium are corrected in the next period, signifying strong adjustment towards equilibrium.

In terms of long-run relationships, LRI has a significant positive effect on LFD (coefficient = 3.97e-12, p = 0.001), while inf has a significant negative effect (coefficient = -0.0011, p = 0.005), suggesting that higher LRI boosts LFD, while higher inf reduces it. On the other hand, LRO and exp have no significant long-run impact on LFD as their p-values are above 0.05, indicating they do not contribute meaningfully to long-term changes in LFD.

Table 6: ARDL Long Run and ECM Short Run Results

Long Run Coefficient estimates

Error Correction Adjustment						
	Coefficient	Std. Err.	**T**	**P>t**	**95% Conf.**	**Interval]**
LRI	3.97e-12	1.08e-12	3.66	0.001	1.71e-12	6.22e-12
LRO	-8.63e-12	2.17e-11	-0.40	0.695	-5.38e-11	3.65e-11
LEXPD	-7.02e-13	4.22e-13	-1.66	0.111	-1.58e-12	1.75e-13
LGDP	-2.29842	2.958364	-0.78	0.463	-9.29384	4.696999
INF	-.0011272	.0003598	-3.13	0.005	-.0018755	-.0003789
LGE	-7.063067	8.799241	-0.80	0.449	-27.86997	13.74383
ECT	-.7047132	.2138878	-3.29	0.003	-1.149517	-.2599092
Short Run Coefficient estimates						
Variables	**Coefficient**	**Std. Err.**	**T**	**P>t**	**95% Conf.**	**Interval]**
LRI. D1.	.0846219	.0552775	1.53	0.170	-.0460886	.2153325
LRO. D1.	.0437457	.0209466	2.09	0.075	-.0057852	.0932767
LEXPD D1.	-.2532768	.1302728	-1.94	0.093	-.5613231	.0547694
LGDP D1.	2.203605	.7780513	2.83	0.025	.3638063	4.043404
INF D1.	.0228958	.0065897	3.47	0.010	.0073137	.0384779
LGE D1.	.5953106	.1888358	3.15	0.016	.148785	1.041836

_cons	11.78225	4.897883	2.41	0.047	.2005942	23.3639

Source: Author's Computation Using Stata 15, 2024.

In the short-run interpretation, the analysis reveals that D1. LGDP (first difference of LGDP), D1. INF (first difference of INF), and D1. LGE (first difference of LGE) have significant positive impacts on LFD with p-values of 0.025, 0.010, and 0.016, respectively. This indicates that short-term changes in these variables are associated with significant changes in LFD. Additionally, D1.LRO shows a marginal positive effect (p = 0.075).

Heteroskedasticity

The results from White's test for heteroskedasticity suggest that there is no evidence of heteroskedasticity in the model. The null hypothesis (Ho) of homoskedasticity (constant variance of the residuals) is tested against the alternative hypothesis (Ha) of unrestricted heteroskedasticity. The chi-squared statistic is 21.00 with 20 degrees of freedom, and the p-value of 0.3971 is greater than typical significance thresholds (e.g., 0.05), indicating that we fail to reject the null hypothesis. This means there is no significant evidence of heteroskedasticity.

Table 7: Test for Heteroskedasticity

White's test for homoscedasticity

	chi2(20) =	21.00
	Prob > chi2 =	0.3971

Cameron & Trivedi's decomposition of IM-test

Source	chi2	Df	P
Heteroskedasticity	21.00	20	0.3971
Skewness	19.84	13	0.0992
Kurtosis	0.02	1	0.8944
Total	40.86	34	0.1945

Source: Author's Computation Using Stata 15, 2024.

Further breakdown with Cameron & Trivedi's IM-test decomposition shows that the heteroskedasticity component also has a chi-squared value of 21.00 with a p-value of 0.3971, reaffirming no heteroskedasticity. The Skewness statistic (chi-squared = 19.84, p = 0.0992) suggests that while there might be some skewness, it is not statistically significant at the 5% level. The Kurtosis statistic (chi-squared = 0.02, p = 0.8944) indicates no significant departure from normality in terms of kurtosis. The Total test statistic (chi-squared = 40.86, p = 0.1945) further supports the conclusion that the model does not suffer from significant issues of heteroskedasticity, skewness, or kurtosis.

Results and Discussion

The following are the result and discussion according to the stated objectives

Objective I: To Examine the Effects of Remittance Inflow on Financial Development in Nigeria

The results indicate that logarithms remittance inflows (LRI) have a significant long-run positive effect on financial development in Nigeria. This finding aligns with studies by Nyamongo et al. (2011) and Karikari et al. (2016), which found that remittances act as a complement to financial development by providing liquidity to financial institutions and encouraging formal financial interactions. Similarly, Williams (2016) and Adekunle et al. (2020) highlighted that remittances are significantly associated with financial development in Sub-Saharan Africa, both in the short and long run.

However, in the short run, remittance inflows show no significant effect on financial development. This mirrors the findings of Oshota and Badejo (2015) and Adigun and Ologunwa (2017), who reported a positive long-run impact of remittances but an insignificant or even negative effect in the short run. These outcomes suggest that while remittance inflows provide critical long-term support to the financial sector by enhancing liquidity and increasing access to financial services, short-term effects may be limited due to inefficiencies in the financial system, delays in formal remittance processing, or the use of informal channels.

Objective II: To Investigate the Effects of Remittance Outflows on Financial Development in Nigeria

The results reveal that remittance outflows (LRO) do not significantly affect financial development in either the long run. This finding is consistent with studies by Garba et al. (2020) and Mehta et al. (2021), which noted that remittance outflows may not significantly influence domestic financial development, especially when outflows are not reinvested or linked to formal financial institutions.

However, these findings contrast with studies such as Falade et al. (2021) and Olaniyan (2019), which suggested that the interplay between remittances (both inflows and outflows) and financial development can enhance economic growth. The lack of significant impact in the Nigerian context could be attributed to the smaller volume of outflows compared to inflows and the potential diversion of outflows to informal channels. This highlights the need for policies aimed at monitoring outflows and encouraging their productive use in ways that could benefit Nigeria's financial system.

Hypotheses Testing

The following are the interpretation of the hypothesis:

H_{01}: There is no significant effect of remittance inflow (LRI) on financial development (LFD) in Nigeria.

In the long run, the p-value of 0.001 indicates a statistically significant effect of remittance inflow on financial development, as it is below the 0.05 threshold. This suggests that remittance inflows have a significant positive impact on financial development in the long run. However, in the short run, the p-value (0.170) indicates no statistically significant effect.

The null hypothesis (H_{01}) is rejected in the long run, but it is not rejected in the short run.

H_{02}: Remittance outflows (LRO) do not have a significant effect on financial development (LFD) in Nigeria.

In the long run, the p-value of 0.695 indicates that remittance outflows do not have a statistically significant effect on financial development. In the short run, the p-value (0.075) is close to the 0.05 threshold but does not reach statistical significance at the conventional level.

The null hypothesis (H_{02}) is accepted, as there is no significant effect of remittance outflows on financial development in either the long or short run.

Summary of Hypotheses Testing

Hypothesis	Variable	Long-Run Effect	Short-Run Effect	Conclusion
H_{01}	LRI	Significant	Not Significant	Reject H_{01} in the long run; not rejected in the short run.
H_{02}	LRO	Not Significant	Not Significant	Fail to reject H_{02}.

Source: Author's Computation Using State 15, 2024.

The results suggest that remittance inflows significantly influence financial development in Nigeria in the long run, while remittance outflows and export diversity do not exhibit significant effects in either the long or short run.

Conclusion

The study analyzed the relationship between Financial Development (FD) and various economic variables such as Remittance Inflow (RI), Remittance Outflow (RO), Gross Domestic Product (GDP), Inflation (INF), and Government Expenditure (GE). The results of the ARDL bound test revealed a significant long-term cointegration among these variables, indicating that they move together over the long run. The error correction model (ECM) demonstrated that about 70.5% of deviations from long-term equilibrium are

corrected within the following period, showcasing a strong adjustment towards equilibrium. The long-run results indicated that RI positively affects FD significantly, while INF negatively impacts FD.. In the short run, changes in GDP, INF, and GE significantly influenced FD, suggesting the importance of these factors for short-term financial development trends. Diagnostic tests confirmed that the model was free from serial correlation and heteroskedasticity, adding robustness to the results.

Recommendations

The study provides the following recommendations for the study:

1. The government and financial institutions should promote the use of formal channels of remittance inflow such as banks and mobile financial services by reducing transaction costs and offering attractive exchange rates.
2. Government should implement systems to track remittance outflows effectively, ensuring transparency and alignment with Nigeria's financial development goals.

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