OPEN ACCESS JOURNALS
Indiana Journal of Economics and Business Management
Abbriviate Tittle- Ind J Econ Bus Manag
ISSN *(Online)*- 2583-3758
Journal Homepage Link- https://indianapublications.com/journal/IJEBM
DOI: https://doi.org/10.5281/zenodo.16645815
INDIANA PUBLICATIONS
PRODUCTIVE AND QUALITY RESEARCH

Research Article

Volume-05|Issue04|2025

Financial Development Indicators and Economic Growth in Nigeria

Yua Paul Mkuma[1], Yua Henry[2], Temitope Abiodun Oje[3]

[1]Graduated from the Department of Banking and Finance, Nnamdi Azikiwe University, Awka.
[2]Department of Banking and Finance, Federal Polytechnic Wannune, Benue State
[3]Scholar, College of Business and Leadership, Eastern University, St Davids, Pennsylvania

Article History
Received: 13.07.2025
Accepted: 28.07.2025
Published: 31.07.2025

Citation
Mkuma, Y. P., Henry, Y. & Oje, T. A. (2025). Financial Development Indicators and Economic Growth in Nigeria. *Indiana Journal of Economics and Business Management, 5*(4), 37-56.

Abstract: This study examined the causal relationship between selected financial development indicators and economic growth in Nigeria. The motivation behind the study is to contribute to the debate whether financial development leads economic growth or is the reverse in Nigeria and also close the gap in literature on the near consensus that financial development was one of supply leading, demand following or bidirectional. Specifically, the study analysed the causation between ratio of money supply to GDP (M2/GDP), ratio of private debt to total debt securities (P/TDS), lending-deposit spread (LDS), liquidity ratio (LR) and stock market returns (SMR) against economic growth. Secondary data were sourced from the Central Bank of Nigeria Statistical Bulletin. The data were checked for unit root and diagnosed for serial correlation, heteroskedasticity, and stability. The data were also subjected to E-GARCH, Johansen Cointegration, vector error correction model, and Granger causality tests.The study found bidirectional causation between financial development and economic growth when ratio of money supply to GDP (M2/GDP) was applied. It also found that financial development leads economic growth using lending-deposit spread (LDS) and liquidity ratio (LR) while economic growth leads financial development when ratio of private debt to total debt securities (P/TDS) and stock market returns (SMR) was used thus providing evidence to support supply-leading hypothesis, demand-following hypothesis and bidirectional relationships between the variables. The study therefore concludes that financial development exhibits unidirectional and bi-directional causality all at the same time depending on the variable under consideration. Thus, the study recommends among others financial sector reforms that engender financial access, real sector growth, sound corporate governance and ease of doing business in Nigeria.

Keywords: Bidirectional causality, demand-following hypothesis, financial development, supply-leading hypothesis

INTRODUCTION

Financial sector development significantly influences economic growth by improving the quality and quantity of financial services. It improves investment information, corporate governance, trading, diversification, risk management, savings mobilization, and facilitates trade. Financial development also promotes technological innovation, enhancing productivity and efficient resource allocation, (King & Levine, 1993; Levine, Loayza, & Beck, 2000)

The banking system provides debt and finance to investors and governments, while the stock market offers equity and direct finance. Stock market performance, measured by indexes, is a key indicator of a country's economic strength and development, (Adjasi & Biekpe, 2006; Emenuga, 1997, Akwam, & Yua, 2021). Stock market returns volatility measures the dispersion around a security's mean return over time. It provides information about future economic activity and structural change, which can depress GDP growth. Structural change consumes resources, and an increase in volatility raises shareholders' compensation for bearing systematic risk. Frimpong and Oteng-Abayie (2006) argue that stock market volatility triggers a rise in cost of capital and directly affects economic growth. The growth rate of GDP per capital is a crucial indicator of economic prosperity, as it represents the total market value of economic activities. However, the relationship between financial development and economic growth remains unclear.

The supply-leading and demand-following hypotheses, popularized by Patrick (1966), suggest that financial development causes economic growth, while economic growth causes financial development. Supporters of the demand-following hypothesis argue that if income grows at a certain pace, the demand for financial assets also grows. Recent developments in Asian economies, such as China, support this theory, as their GDP growth has remained above 7% year on year for the past 25 years despite repressive financial systems. Also considering that the Nigerian financial sector has undergone and is at present undergoing series of reforms aimed at revamping the economy, making it competitive, and enhancing its performance, the economy still remain vulnerable and fragile against the backdrop of sustained recovery, Wuave, Yua, & Yua, (2020); Yua, Epor, & Utor (2023); Ajekwe, Yua & Tyona (2024).

This study seeks to examine the causal relationship between selected financial development

***Corresponding Author:** Yua Henry

indicators and economic growth in Nigeria by capturing the four buckets of financial development measurement indicators (financial depth, access, efficiency and stability) using quarterly data and employing Granger causality test to ascertain the direction of such relationship.

LITERATURE REVIEW

Conceptual Review

Financial Development

Nouren (2009) Financial development refers to the policies, factors, and institutions that facilitate efficient intermediation and effective financial markets. It involves the improvement of quantity, quality, and efficiency of financial intermediary services, which can lead to economic growth. Financial development plays a significant role in economic development by promoting capital accumulation, technological progress, and capital allocation. Countries with better-developed financial systems tend to grow faster over time, reduce poverty and inequality, facilitate risk management, and increase investment and productivity. Financial sector development also facilitates the growth of small and medium-sized enterprises (SMEs), which are labor-intensive and create more jobs than large firms (Yua, 2025). However, financial development goes beyond just having financial intermediaries and infrastructures; it also involves robust policies for regulation and supervision of all important entities. The global financial crisis highlighted the potential consequences of weak financial sector policies for financial development and economic outcomes.

Measurement of Financial Development

Table 1: Measurement of Financial Development

	Financial Institutions	Financial Markets
Depth	• Private Sector Credit to GDP • Financial Institutions' asset to GDP • M2 to GDP • Deposits to GDP • Gross value added of the financial se GDP	• Stock market capitalization and outstanding domestic private debt securities to GDP • Private Debt securities to GDP • Public Debt Securities to GDP • International Debt Securities to GDP • Stock Market Capitalization to GDP • Stocks traded to GDP
Access	• Accounts per thousand adults(commercial banks) • Branches per 100,000 adults (commercial banks) • % of people with a bank account (from user survey) • % of firms with line of credit (all firms) • % of firms with line of credit (small firms)	• Percent of market capitalization outside of top 10 largest companies • Percent of value traded outside of top 10 traded companies • Government bond yields (3 month and 10 years) • Ratio of domestic to total debt securities • Ratio of private to total debt securities (domestic) • Ratio of new corporate bond issues to GDP
Efficiency	• Net interest margin • Lending-deposits spread • Non-interest income to total income • Overhead costs (% of total assets) • Profitability (return on assets, return on equity) • Boone indicator (or Herfindahl or H-statistics)	• Turnover ratio for stock market • Price synchronicity (co-movement) • Private information trading • Price impact • Liquidity/transaction costs • Quoted bid-ask spread for government bonds • Turnover of bonds (private, public) on securities exchange • Settlement efficiency
Stability	• Z-score • Capital adequacy ratios • Asset quality ratios • Liquidity ratios • Others (net foreign exchange position to capital etc)	• Volatility (standard deviation / average) of stock price index, sovereign bond index • Skewness of the index (stock price, sovereign bond) • Vulnerability to earnings manipulation • Price/earnings ratio • Duration • Ratio of short-term to total bonds (domestic, int'l) • Correlation with major bond returns (German, US)

Source: World Bank, 2012

***Corresponding Author:** Yua Henry

Determinants of Financial Development

Legal Traditions: Lopez, Porta, Shleifer, and Vishny's "Law and Finance" explains financial development differences among countries, emphasizing property rights, contract enforcement, and civil law. Beck's dynamic law and finance theory emphasizes adaptability.

Institutions: Endowment theory suggests that economic institutions determine economic and financial development, with some countries supporting rule of law and rational investments while others hinder progress due to colonization strategies. Rajan and Zingales' interest group theory emphasizes trade and capital markets openness, legal systems, and power distribution among social and economic groups. Decision-makers may oppose effective systems if they oppose personal interests.

Financial Liberalization: Arestis (2006) Financial liberalization involves privatizing government-owned institutions, guaranteeing free entry, and implementing loose interest rate control mechanisms, potentially leading to better resource allocation, higher investments, and efficiency.

Openness policies

Trade growth and capital account liberalization promote welfare by promoting international trade, capital flow, and financial development, leading to increased exports, GDP, and improved stock market liquidity.

Klein and Olivei (1999) argue that capital account liberalization Voghouei *et al.* (2011) suggest that liberalization of capital markets can boost investment and economic growth by reducing transaction costs, effective resource allocation, and moral hazards in management behavior.

Political economy factors: financial development is influenced by centralized systems and authoritarian regimes, as well as economic institutions and resource distribution. Elite groups may favor financial repression, while democratic systems can spur development through checks and balance mechanisms and rule-based constraints.

Stock Market Volatility

Volatility refers to sharp fluctuation in the price of a financial asset or market within a short period of time. Volatility is a measure of dispersion around the mean or average return of a security. One way to measure volatility is by using the standard deviation, which explains how tightly the price of a stock is grouped around the mean or moving average (MA). When the prices are tightly bunched together, the standard deviation is small. When the price movements are spread apart, a relatively large standard deviation occurs. Stock market volatility can be defined as the possibility that a given stock will experience a drastic rise or fall in value within a predetermined time frame (Okpara, 2011; Omale, Yua, & Azubuike, 2024).

Factors Affecting Stock Market Volatility

Existing literature has generally found that internal and external factors, such as dividend yield, exchange rate, inflation, interest rate, industrial production, the MSCI world index, financial liberalisation and market integration have had a collective cumulative effect on volatility in the stock market, Ajekwe, Yua, Epor, &Victor, 2024).

Economic Growth

Economic growth is simply the percentage or proportionate increase in real income during a given period, usually a year. It is the rate at which Gross Domestic Product (GDP) of a country is increasing – positive growth, or decreasing-negative growth. According to Jhingan (2007), economic growth is related to a quantitative sustained increase in the country's per capita output or income accompanied by expansion in its labour force, consumption, capital and the volume of trade. It is believed that economic growth is good for stock returns as well as it helps forecast the stability of international asset allocation decisions (Ritter, 2005 Yua, & Temitope, 2024).

THEORETICAL REVIEW

Demand Following and Supply Leading Hypotheses:

The Demand Following Hypothesis suggests that economic growth leads to financial development. In this view, as the economy grows, businesses expand, incomes rise, and industries develop, there is increased demand for financial services like banking, insurance, loans, and investments. Financial institutions, markets, and products develop in response to this growing demand. Example: When a country's industries and trade grow rapidly, banks expand to serve more customers and offer more sophisticated products. The Supply Leading Hypothesis argues that financial development drives economic growth. Here, the idea is that a strong and advanced financial system, with banks, stock markets, and other institutions, provides the resources, services, and infrastructure needed for businesses to grow and investments to happen.

Thus, developing financial institutions actually stimulates economic development. For instance, when governments focus on creating modern banking systems and financial regulations, it encourages entrepreneurship, trade, and industry expansion.

Efficient Market Hypothesis (EMH)

Developed by Fama (1965) EMH suggests that financial markets are "informationally efficient." This means that asset prices, such as stock prices,

***Corresponding Author:** Yua Henry

always reflect all available information at any given time. In an efficient market, it is impossible to consistently achieve returns that outperform the overall market through stock picking or market timing because any new information that could affect a stock's value is already incorporated into its price almost immediately.

Empirical Evidence

Table 2: Literature Exploration

Author/Year	Study Area	Title of the Study	Methodology	Findings
King and Levine (1993)	USA	The relationship between financial development and economic growth	Three Stage Least Squares	The study found that, the level of financial development predicts future economic growth and future productive advances
Hassan, Sanchez and Yu (2021)	168 Countries	Causal Relationship financial development and economic growth	Panel Regression Analysis	The study found a two- way directional causality exist between financial development and economic growth
Zang and Kim (2017)	74 Countries	Financial development and economic growth	Panel Estimator	The study found that economic growth precedes subsequent financial development.
Ghirmay (2024)	13 sub-Saharan African countries	Causal relationship between financial development and economic growth	Bivariate VAR model	Financial development leads economic growth in eight countries while six countries depict a bidirectional causal relationship
Odhiambo (2017)	Three Sub-Saharan African countries	The causal relationship between financial development and economic growth	Granger Causality	Revealed that in both Kenya and South Africa, the direction of causality is from economic growth to financial development while Tanzania also exhibits unidirectional causality
Ogiriki and Andabai (2024)	Nigeria	Financial development and economic growth	vector autoregressive (VAR)	The study found a long-run equilibrium relationship exist between economic growth and financial development and the result also confirmed about 96% short-run adjustment speed
Torruam, Chiawa and Abur (2023)	Nigeria	Financial development and economic growth		Financial development has a positive impact on economic growth
Omankhanlen (2022)	Nigeria	Financial sector reforms in the Nigerian economy and its impacts on economic growth		Financial sector developments that were experienced in Nigeria had significant positive effect on the activities
Odeniran and Udeaja (2020)	Nigeria	The relationship between financial sector development and economic growth	Granger causality tests in a VAR framework	Bi-directional causality between some of the proxies of financial development and economic growth variable
Akingunola, Olusegun, Oluwaseyi and Olusoyi (2023)	Nigeria	The relationship between financial liberalization and economic growth		The study found that financial development had insignificant impact on economic growth
Nzotta and Okereke (2019)	Nigeria	Financial development and economic growth	Two stage least square	Financial development does not support economic growth in Nigeria
Osisanwa and Atanda (2022)	Nigeria	The determinants of the stock market returns in Nigeria	OLS techniques	showed that exchange rate, interest rate, money supply and previous stock return levels are the primary determinants of stock returns in Nigeria

***Corresponding Author:** Yua Henry

Osamwonyi and Evbayiro-Osagie (2022)	Nigeria	The relationship between macroeconomic variables and the stock market index	vector error correction model (VECM)	Macroeconomic variables influence the stock market in Nigeria
Nkoro & Uko (2023)	Nigeria	The impact of domestic macroeconomic variables on the Nigerian stock market returns	GARCH-Model	The study found that the inflation rate, index of manufacturing output, and interest rate exerted strong significant influence on stock return.
Kibria, Mehmood, Kamran, Arshad, Perveen, and Sajid, (2014)	Pakistan	The impact of Macroeconomic variables	Correlation Analysis, Descriptive Analysis, Regression analysis and Granger causality Test	Revealed that exchange rate, inflation, GDP savings, money supply, and GDP per capita have a significant positive impact on the stock market returns.
Khan (2014)	Pakistan	The relationships between KSE-100 and the macroeconomic factors	Multiple Regression and Pearson's correlation	found that gross domestic product, exchange rate, and inflation were positively related to the stock prices
Dritsaki and Dritsaki-Bargiota (2005)	Greece	the causal relationship between stock, credit market and economic growth	trivariate VAR model	results revealed unidirectional causality from economic development to stock market and bidirectional causality between economic developments and the banking sector
Nnachi, & Nnamani (2017).	Nigeria	Estimating the Causal Relationship between Financial Development and Economic Growth in Nigeria	Johansen cointegration and Granger causality test	The result found uni-directional causal relationship between financial development and economic growth.
Odo, Ogbonna, Agbi and Anoke, 2016).	Nigeria and South Africa	Financial Sector Development-Economic Growth Nexus: Empirical Evidence from Nigeria	VECM and granger causality test	This study therefore concludes that supply – leading phenomena (Finance – led growth) is evident in both Nigeria and South Africa economies
Nkoro and Aham, (2013).	Nigeria	Financial Sector Development-Economic Growth Nexus: Empirical Evidence from Nigeria	Cointegration and Error Correction Mechanism (ECM)	The empirical results show that there is a positive effect of financial sector development on economic growth in Nigeria
Ahmad, Adam, Ahmad, and Umar (2015)	Nigeria	Stock Market Returns and Macroeconomic Variables in Nigeria: Testing for Dynamic Linkages with a Structural Break	Bound Cointegration Autoregressive Distributive Lag (ARDL) and Vector Autoregressive Model (VAR).	The Granger causality tests showed that some of the macroeconomic variables were having bidirectional causality with the stock market returns; while others have unidirectional causality
Nzomo and Dombou-Tagne (2017).		Stock markets, volatility and economic growth: evidence from Cameroon, Ivory Coast and Nigeria	GARCH and VAR	The study found that NSE is more volatile than BRVM or DSX.
Nwanna, (2017).	Nigeria	Impact of Capital Market Volatility on Economic	Autoregressive Conditional	The study found evidence of a muted effect of capital market

		Growth in Nigeria (1985 - 2016)	Heteroskedasticity models	volatility on the Nigeria's economic development
Asemota, and Ekejiuba (2017).	Nigeria	An Application of Asymmetric GARCH Models on Volatility of Banks Equity in Nigeria's Stock Market.	EGARCH (1, 1) and CGARCH (1, 1) model	The results reveal the presence of ARCH effect in B2 and B3 equity returns. In addition, the estimated models could not find evidence of leverage effect.
Izunobi, Nzotta, Ebiringa, Akujuobi, Chigbu, (2017)	Nigeria	Macroeconomic Variables Volatility in the Nigerian Stock Market; An Empirical Analysis	GARCH and EGARCH	The study concludes that there is high and persistent volatility in the stock market returns. Inflation and interest rate was also found to have significant impact on stock market returns volatility.
Ndako (2010)	Nigeria and South Africa	Financial Development, Economic Growth and Stock Volatility: Evidence from Nigeria and South Africa	Multivariate vector autoregressive (VAR) and Vector Error Correction Model (VECM). Generalised Impulse Response Function (GIRF) and Variance Decomposition (VDC).	The results for Nigeria suggest the existence of unidirectional causality from economic growth to financial development using bank credit to private sector. While using liquid liabilities, it indicates bidirectional causality between financial development and economic growth. In the case of South Africa, the findings suggest the existence of bidirectional causality between financial development and economic growth using the banking system. However, when the stock market variables are used, the results indicate unidirectional causality from economic growth to stock market system

RESEARCH METHODOLOGY

Research Design

The study used ex-post facto and causal research design, relying on historical data from the Central Bank of Nigeria. Ex-post factor research involves events that cannot be manipulated, while causal research design determines cause-effect relationships between independent and dependent variables.

Model Specification

The basic structure of the econometric model for this study closely follows King and Levin (1993) empirical model tested in the literature where;

$$X_{it} = \alpha + \beta[FD]_{it} + \lambda[Other]_{it} + \varepsilon_{it} \quad \text{----------3.1}$$

Where *FD* stands for a number of financial development variables, *others* stands for non-financial development (control) variables and *X* stands for economic growth.

Therefore, following the propositions of McKinnon and Shaw (1973) complementarity hypothesis that (i) an innovation in financial development will results to increase in total investment and improvements in the allocation of investment, with a given state of technology, thus result in a boost to the rate of economic growth (ii) financial intermediaries and financial markets are two important institutions, which contribute to the optimal allocation of resources in an economy and by extension boost economic growth and (iii) alleviating financial restrictions in developing countries by allowing market forces to determine real interest rates can exert positive effect of growth rates as interest rates rise to its competitive equilibrium respectively. Hence, this study specified an eclectic model that is inspired by King and Levine (1993).

The model predicts that economic growth (proxy by real GDP) is determined by indicators of financial development (proxy by ratio of money supply to GDP, ratio of private to total debt security, lending deposit spread and liquidity ratio), stock market returns (proxy by All Shares Index), exchange rate and inflation rate (measured using CPI), such that:

$$SMR_t = \left(\frac{ASI_t - ASI_{t-1}}{ASI_{t-1}}\right) * 100 \quad \text{---------- 3.2}$$

$$INF_t = \left(\frac{CPI_t - CPI_{t-1}}{CPI_{t-1}}\right) * 100 \quad \text{---------- 3.3}$$

Where, SMR_t stands for stock market returns in period *t*, ASI_t denotes All shares index in period *t* and ASI_{t-1}

***Corresponding Author:** Yua Henry

is All shares index for the previous period $(_{t-1})$. INF_t denotes inflation rate in period t, CPI_t denotes Consumer price index in period t; and CPI_{t-1} denotes Consumer price index for the previous period $(_{t-1})$.

Substituting into equation 3.1, the stochastic model for the study is therefore expressed as;

$$RGDP = \alpha + \alpha_1 M2/GDP + \alpha_2 P/TDS + \alpha_3 LDS + \alpha_4 LR + \alpha_5 SMR + \alpha_6 INF + EXR + \varepsilon_1 \quad \text{--3.4}$$

Where:

RGDP = (Economic Growth): is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year, expressed in base-year prices.

M_2/GDP = Ratio of money supply to GDP (financial depth variable): is the ratio of M_2 to nominal GDP and is often called the monetization ratio as used by King and Levine (1993). It reflects the depth of the financial market relative to the overall economy. Increases in this ratio indicate further expansion in the financial sector relative to the rest of the economy.

P/TDS = Ratio of private debt to total debt securities (Financial access variable): is the proportion of private sector debt to the entire total debt portfolio.

LDS = Lending-deposits spread (financial efficiency variable): is the difference between total interest and commission received over total earning assets and total interest paid minus fees over total interest bearing liabilities (Hossain, 2010).

LR = Liquidity Ratio (financial stability variable): This is the percentage of bank deposits that the banks should hold in the form of cash or eligible liquid assets in the tills of the bank.

SMR = Stock market returns (Stock market volatility variable) proxy by All Share Index: is used as a general measure of the performance of the stock markets in terms of price appreciation or depreciation. These indices are important economic indicators as they gauge the health and very often can predict the future direction of economic activity (Ikoku & Okorie, 2010).

INF = Inflation rate (Control variable): is a sustained increase in the general price level of goods and services in an economy over a period of time.

EXR = Exchange rate (Control variable): is a relative price that measures the worth of one country's domestic currency in terms of another country's currency. It relates the purchasing power of domestic currency in terms of volume of goods and services it can purchase vis-à-vis a foreign trading partners currency over the specific period of time.

Techniques of Data Analysis

The study will employ both descriptive statistics and econometric tools in analyzing the data. The descriptive tools consist of descriptive statistics (means, standard deviation, skewedness, kurtosis and Jaque-Bera) and graphs, while the econometric tools include the E-GARCH, Unit root test, vector autoregressive, vector error correction model, general impulse response function, and Granger causality tests.

DATA PRESENTATION AND ANALYSIS

Data Presentation

Descriptive Statistics

The result of the descriptive statistics is presented in Table 3

Table 3: Descriptive Statistics

	RGDP	M2GDP	PTDS	LDS	LR	SMR	INF	EXR
Mean	34514440	14.50945	0.493214	45.77340	22.49844	16.63664	19.96828	86.14242
Median	25070134	12.91250	0.401773	45.02500	21.93000	20.17040	12.45500	107.2600
Maximum	69023930	21.54000	0.868393	65.00000	45.30000	83.69824	87.84000	305.2000
Minimum	14953913	9.200000	0.163683	29.10000	11.00000	-61.18502	-2.790000	0.850000
Std. Dev.	18094474	3.837855	0.259966	8.106035	5.297932	26.37397	19.47861	70.66974
Skewness	0.694840	0.591944	0.373324	0.212146	0.541962	-0.476400	1.567618	0.366228
Kurtosis	1.985354	1.788224	1.407371	2.725630	5.404889	3.288024	4.508797	2.475146
Jarque-Bera	15.79049	15.30663	16.50106	1.361618	37.11137	5.284195	64.56627	4.330476
Probability	0.000373	0.000474	0.000261	0.506207	0.000000	0.071212	0.000000	0.114723
Sum	4.42E+09	1857.210	63.13141	5858.995	2879.800	2129.490	2555.940	11026.23
Sum Sq. Dev.	4.16E+16	1870.600	8.582936	8344.892	3564.646	88339.47	48185.86	634264.9
Observations	128	128	128	128	128	128	128	128

Source: Author's Computation Using Eviews 10

The descriptive results in Table 3 show that real gross domestic product (RGDP) averaged ₦34,514,440 billion over time with a standard deviation of ₦18,094,474 billion. It had a maximum value of ₦69023930 billion and a minimum value of ₦14953913. Mean ratio of money supply to GDP (M2/GDP) was 14.50945 billion with a standard deviation of ₦3.837855 billion. It had maximum and minimum values of ₦21.54000 billion and N9.200000 billion respectively. Ratio of private debt to total debt securities (P/TDS)

***Corresponding Author:** Yua Henry

averaged ₦0.493214 billion over the period of study with a standard deviation of N0.259966. It had maximum and minimum values of ₦0.868393 billion and N0.163683 billion respectively. Lending-Deposit spread (LDS) had a mean value of ₦45.77340 billion over the period of study with a standard deviation of ₦8.106035 billion. It had maximum and minimum values of ₦65.00000 billion and ₦29.10000 respectively. Liquidity ratio (LR) averaged ₦22.49844 over the period of study with a standard deviation value of ₦5.297932. It had maximum and minimum values of ₦45.30000 billion and ₦11.00000 respectively. Similarly, stock market returns (SMR) averaged 16.63664 percent with a standard deviation of 26.37397 percent. It had a maximum value of 83.69824 percent and a minimum value of -61.18502 percent. Also, inflation rate had a mean value of 19.96828 over the study period with a standard deviation of 19.47861. It had maximum and minimum values of 87.84000 percent and -2.790000 percent respectively. Lastly, exchange rate averaged ₦86.14242 against a dollar with a standard deviation of ₦70.66974. It had maximum and minimum values of ₦305.2000 and ₦0.850000 respectively. The Jarque-Bera test of normality for all the variables except liquidity ratio and inflation indicate that the variables are normally distributed at 5% level of significance. Thus, estimates resulting from this data set are reliable, consistent and unbiased.

Testing for Autoregressive Conditional Heteroskedasticity (ARCH) Effect

The justification for using a volatility modeling approach in this study rest on the fact that stock market returns (SMR) series is a high frequency variable and may be affected by the autoregressive conditional heteroskedasticity, the so called 'ARCH effect'. It is therefore important to test for the presence of conditional heteroskedasticity, an absence of which makes the use of the proposed E-GARCH for volatility modeling inappropriate. The result of the ARCH test is presented in table 3 below;

Table 4: Pre-estimation, Heteroskedasticity Test: ARCH

F-statistic	135.5781	Prob. F(1,124)	0.0000
Obs*R-squared	65.81001	Prob. Chi-Square(1)	0.0000

Source: Author's Computation using Eviews 10

Table 4 shows the result of the pre-estimation test for autoregressive conditional heteroskedasticity (ARCH). The F-statistic value of 135.5781 and probability of F-statistic 0.0000 show that, sufficient evidence does not exist to accept the null hypothesis of the absence of ARCH effect. The null hypothesis is therefore rejected in favor of the alternative hypothesis of the presence of ARCH effect in the model. This implies that the series in question is volatile which requires modeling for volatility using the Exponential General Autoregressive Conditional Heteroskedasticity (E-GARCH) approach. The result of the estimated E-GARCH model is presented in the Table 5:

Table 5: E-GARCH Model output

Dependent Variable: SMR

Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)

LOG(GARCH) = C(2) + C(3)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(4)
*RESID(-1)/@SQRT(GARCH(-1)) + C(5)*LOG(GARCH(-1)) + C(6)
*RGDP

Variable	Coefficient	Std. Error	z-Statistic	Prob.
SMR(-1)	0.968369	0.010100	95.87872	0.0000
		Variance Equation		
ω	-4.501173	5.420932	-0.830332	0.4064
δ	1.392705	0.392240	3.550646	0.0004
λ	0.177959	0.251071	0.708800	0.4784
β	0.508412	0.162110	3.136208	0.0017
ψ	0.300996	0.335184	0.898002	0.3692

R-squared	0.888721	Mean dependent var	16.76764
Adjusted R-squared	0.888721	S.D. dependent var	26.43658
S.E. of regression	8.818845	Akaike info criterion	6.633278
Sum squared resid	9799.274	Schwarz criterion	6.767649
Log likelihood	-415.2131	Hannan-Quinn criter.	6.687871
Durbin-Watson stat	1.999999		

Source: Author's Computation using Eviews 10

Table 5 shows the results for the mean and variance equations from the Exponential General Autoregressive Conditional Heteroskedasticity (E-GARCH) model. The variance equation provides information on the persistence and impact of shocks as

***Corresponding Author:** Yua Henry

well as asymmetry and the relationship between stock market returns and economic growth in Nigeria.

The coefficient (λ) of 0.177959 measures the presence of information asymmetry. It is however not statistically significant given probability value of 0.4784 which is greater than 0.05 significance level. This implies the absence of information asymmetry which thus reduces the model to a GARCH type. It means that positive and negative shocks have identical effects on the stock market returns series. That is, bad and good news will increase volatility of stock market returns in the same magnitude. It simply means that capital investors on the Nigerian stock exchange reacts the same way to information be it positive or negative in making investment decisions. The result of the GARCH (1, 1) model due to absence of information asymmetry is presented in Table 6:

Table 6: GARCH (1,1) Model

Dependent Variable: SMR

GARCH = C(2) + C(3)*RESID(-1)^2 + C(4)*GARCH(-1) + C(5)*RGDP

Variable	Coefficient	Std. Error	z-Statistic	Prob.
SMR(-1)	0.949695	0.014030	67.68948	0.0000
	Variance Equation			
C	-284.9988	141.2364	-2.017885	0.0436
RESID(-1)^2 (β)	1.010836	0.335879	3.009527	0.0026
GARCH(-1)(ρ)	-0.072176	0.041010	-1.759961	0.0887
RGDP	17.33680	8.363419	2.072932	0.0382

R-squared	0.888680	Mean dependent var	16.76764
Adjusted R-squared	0.888680	S.D. dependent var	26.43658
S.E. of regression	8.820475	Akaike info criterion	6.566849
Sum squared resid	9802.898	Schwarz criterion	6.678825
Log likelihood	-411.9949	Hannan-Quinn criter.	6.612343
Durbin-Watson stat	1.978128		

Source: Author's Computation using Eviews 10

Table 6, provides information about predicting volatility, the persistence of shock, the impact of shock and the relationship between stock market returns and economic growth. The variance equation indicate that the probability of RESID (-1) ^2 (β) (ARCH term) is equal to 0.0026, that is less than 5 percent which means that the ARCH term is significantly predicting volatility in the model. However, the probability of the GARCH (-1)(ρ) (GARCH term) is equal to 0.0887 which is great than 5 percent implying that GARCH term is insignificant and cannot predict volatility. The value of the adjusted R-squared is equal to 88.86%. This means that the model 88.86 % healthy.

For a measure of persistence, the coefficient ($\beta + \rho$) = 0.94 shows that there is high persistence in the stock market return series. For impact of shocks, the coefficient of +0.94 which is less than one indicates that shocks to the stock market returns series do not have a permanent but temporary impact. The coefficient of RGDP measures the relationship between stock market returns and RGDP. The coefficients 17.34 and probability of 0.03 indicates a positive and statistical significant relationship between stock market returns and economic growth in Nigeria.

The result also provides information about the stationarity of the stock market returns series in Nigeria showing that it is a shock dissipating process. A shock to stock market returns on the Nigeria stock exchange persists for a while then decay out in the long run. By implication, since good or bad news has identical impact, either positive or negative shocks will have the same rate of persistence and will equally decay out in the long run.

Validation of the Model

The model is validated by checking if it is still ensued with heteroskedasticity. This entails carrying out an autoregressive conditional heteroskedasticity (ARCH) test on the exponential generalized autoregressive conditional heteroskedasticity (E-GARCH) model to ascertain if volatility is still prevalent in the model. The result of the post estimation test is presented in Table 7.

Table 7: Post-estimation Heteroskedasticity Test: ARCH

F-statistic	0.004997	Prob. F(1,124)	0.9994
Obs*R-squared	0.072107	Prob. Chi-Square(1)	0.9994

Source: Author's Computation using Eviews 10

The F-statistic value 0.004997 and its probability of 0.9994 in Table 8 provide evidence to accept the null

***Corresponding Author:** Yua Henry

hypothesis of no ARCH effect in the model. The model is therefore free from conditional heteroskedasticity and therefore reliable for further analysis and the results obtained thereof would be suitable for policy formulation and inference.

Unit Root Test

Before the estimation of the model, all the variables of the study were subjected to unit root tests to determine the stationarity levels of the series. The results of the tests are presented in Table 8.

Table 8: Augmented Dickey Fuller Test

Variables	ADF Statistics @ Level	t-statistic @ 5%	ADF Statistics @ 1st Difference	t-statistic @ 5%	Order of integration
RGDP	-0.811634 (0.8121)	-2.884477	-2.964854 (0.0431)*	-2.884477	I(1)
M2GDP	-1.354145 (0.6027)	-2.884477	-4.407535 (0.0005)*	-2.884477	I(1)
PTDS	-1.719371 (0.4191)	-2.884477	-3.656153 (0.0059)*	-2.884477	I(1)
LDS	-2.660224 (0.0617)	-2.886074	-3.380309 (0.0136)*	-2.886074	I(1)
LDR	-2.426523 (0.1118)	2.884856	-10.41174 (0.0000)*	-2.884665	I(1)
SMR	-2.853786 (0.0540)	-2.886074	-3.387987 (0.0133)*	-2.886074	I(1)
INF	-2.616867 (0.0567)	-2.884477	-6.892183 (0.0000)*	-2.884477	I(1)
EXR	1.646066 (0.9996)	-2.884291	-9.952340 (0.0000)*	-2.884477	I(1)

Source: Author's computation using Eviews 10

*Note: Values in Parentheses are probabilities and * indicates significance at 5% level*

The results from Table 8 indicate that none of the series is stationary at level as their probability values are all greater than 0.05 (5%) critical level which led to the acceptance of the null hypothesis (Series has a unit root) for all the series. However, the null hypothesis was consistently rejected for all the series (variables) when expressed in first difference, suggesting that, all the variables are integrated of order one (I(1)). The results reported are for those with intercept. The implication is that all the variables have mean reverting ability; suggesting long-run equilibrium among the variables.

Cointegration Analysis

Having confirmed that all the variables are stationary at first difference and integrated of the same order (I(1)), the appropriate technique to determine the existence of long run relationship among these variables is the Johansen cointegration test. Prior to this, we considered the optimal lag length for the VAR specification. The results of two different information criteria, Akaike (AIC) and Schwarz (SC) used unambiguously showed that the optimal lag length is one as shown in Table 9.

Table 9: Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-1128.076	NA	0.058806	19.86793*	21.35459*	20.47167*
2	-792.9031	580.9658	0.000648*	15.34838	18.32171	16.55587
3	-753.6407	62.81987	0.001009	15.76068	20.22066	17.57190
4	-705.9670	69.92133	0.001409	16.03278	21.97943	18.44775
5	-614.8872	121.4398	0.000998	15.58145	23.01476	18.60016
6	-527.9192	104.3616*	0.000804	15.19865	24.11863	18.82110
7	-471.9574	59.69257	0.001178	15.33262	25.73926	19.55881
8	-395.6748	71.19711	0.001372	15.12791	27.02121	19.95784

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

In order to check for cointegration, we used the Johansen procedure which uses maximum-likelihood method of estimation to ascertain the number, if any, of cointegrating relationships in the vector autoregressive equation. The results of the Johansen cointegration test are presented in Table 10

***Corresponding Author:** Yua Henry

Table 10: Multivariate Johansen Cointegration Test Result

Cointegration Vector (Series) = (*RGDP, M2/GDP, P/TDS, LDS, LR, SMR, INF, EXR*)					
Unrestricted Cointegration Rank Test (Trace)					
Null Hypothesis	Alternative Hypothesis	Eigen Value	Trace Statistic	0.05 Critical Value	Probability
r = 0	r = 1	0.677988	315.2155	169.5991	0.0000
r ≤ 1	r = 2	0.421395	175.8358	134.6780	0.0000
r ≤ 2	r = 3	0.277638	102.5382	103.8473	0.1436
r ≤ 3	r = 4	0.191134	68.53499	76.97277	0.1848
r ≤ 4	r = 5	0.131294	42.44404	54.07904	0.3538
r ≤ 5	r = 6	0.120574	25.13167	35.19275	0.3923
r ≤ 6	r = 7	0.038844	9.327915	20.26184	0.7053
r ≤ 7	r = 8	0.035570	4.454792	9.164546	0.3486
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)					
Null Hypothesis	Alternative Hypothesis	Eigen Value	Max-Eigen Statistic	0.05 Critical Value	Probability
r = 0	r = 1	0.677988	139.3796	53.18784	0.0000
r ≤ 1	r = 2	0.421395	67.29761	47.07897	0.0001
r ≤ 2	r = 3	0.277638	40.00322	40.95680	0.0638
r ≤ 3	r = 4	0.191134	26.09095	34.80587	0.3720
r ≤ 4	r = 5	0.131294	17.31237	28.58808	0.6344
r ≤ 5	r = 6	0.120574	15.80375	22.29962	0.3124
r ≤ 6	r = 7	0.038844	4.873123	15.89210	0.8990
r ≤ 7	r = 8	0.035570	4.454792	9.164546	0.3486

Source: Author's Computation using E-Views 10

For both trace test and maximum eigenvalue test, the null hypothesis is that there are r cointegrating vectors while the alternative hypotheses are *r+1* and at least *r+1* cointegrating vectors for the trace statistic and max-eigen statistic respectively. From the table, both the trace and the max-eigenvalue tests indicate that there are two cointegrating equations among the variables at 5% level of significance. To determine the true cointegrating vectors from the Johansen test, we followed Arestis and Demetriades (1997) in normalizing each of the vectors on the variable for which a clear evidence of error correction is found as shown in Table 11.

Table 11: VECM Results before Normalization, indicating the Two Cointegrating Vectors before Normalization

Vector Error Correction Estimates		
Cointegrating Eq:	**CointEq1**	**CointEq2**
RGDP(-1)	1.000000	0.000000
M2GDP(-1)	0.000000	1.000000
PTDS(-1)	-3.446220	-9.333668
	(0.96215)	(1.80229)
	[-3.58180]	[-5.17877]
LDS(-1)	-0.010294	0.181769
	(0.02195)	(0.04112)
	[-0.46890]	[4.42004]
LR(-1)	0.015795	-0.135532
	(0.03281)	(0.06147)
	[0.48135]	[-2.20491]
SMR(-1)	-0.039796	-0.073471
	(0.00702)	(0.01314)
	[-5.67216]	[-5.59045]
INF(-1)	0.014042	0.050185
	(0.01011)	(0.01894)
	[1.38859]	[2.64926]

EXR(-1)	0.001197	-0.029307
	(0.00460)	(0.00862)
	[0.26020]	[-3.40028]
C	-15.13975	-12.39374

Error Correction:	D(RGDP)	D(M2GDP)	D(PTDS)	D(LDS)	D(LDR)	D(SMR)	D(INF)	D(EXR)
CointEq1	-0.032022	0.023392	0.003541	1.276771	-0.618880	0.918034	-0.287417	3.862867
	(0.00984)	(0.04783)	(0.00271)	(0.27979)	(0.45431)	(1.02994)	(1.02963)	(1.82336)
	[-3.25427]	[0.48906]	[1.30438]	[4.56333]	[-1.36224]	[0.89135]	[-0.27915]	[2.11854]
CointEq2	0.001083	-0.058572	-0.000578	-0.635539	0.336212	1.560511	0.140737	-0.105885
	(0.00037)	(0.02123)	(0.00121)	(0.12421)	(0.20169)	(0.45724)	(0.45710)	(0.80947)
	[2.90814]	[-2.75845]	[-0.47925]	[-5.11661]	[1.66698]	[3.41291]	[0.30789]	[-0.13081]

Table 11 presents the results from the estimated vector error correction model (VECM) without any restrictions. A comparison of the coefficients of the error correction terms revealed that the first cointegrating vector shows that Real GDP per capita (RGDP) has the most significant and correctly signed adjustment coefficient, with a t-value of –3.25427. This suggests that RGDP equation constitutes a true cointegrating relationship in the first vector. Thus, there exists a sustainable long-run equilibrium relationship amongst the variables in the RGDP equation. This is corroborated by the fact that RGDP is the target variable in the study.

The graph of the two cointegrating vectors is shown in Figure 1

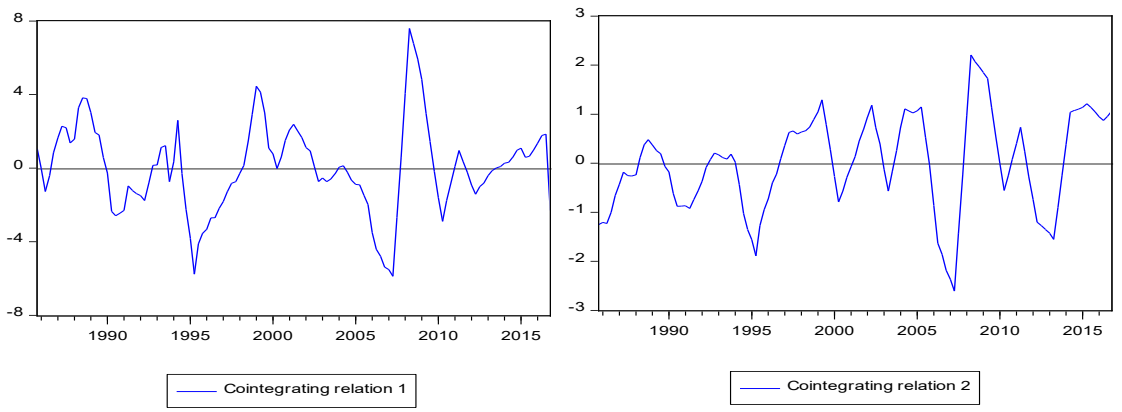

Figure 1: Graph of the two Cointegrating Vectors
Source: Graphs Using E-view Statistical Package, Version 10

The graphs exhibit mean-reversion thus indicating a clear evidence of true cointegrating vectors of real GDP (RGDP) and ratio of money supply to GDP (M2/GDP). However, since our interest and target is on RGDP, we do not report the result for the second vector. Therefore, the model was normalised on RGDP in order to obtain the long run and short run parameter estimates and possible inferences.

Table 12: Long-run Parameters of VECM Normalized on RGDP

Parameters	Coefficient	Standard Error	t-Statistic
RGDP(-1)	1	-	-
M2/GDP(-1)	0.811947	0.11584	7.00898
P/TDS(-1)	3.956608	1.16971	3.38254
LDS(-1)	-0.157230	0.02412	-6.51945
LR(-1)	0.127402	0.03673	3.46860
SMR(-1)	0.017947	0.00670	2.68044
INF(-1)	-0.026569	0.00947	-2.80667
EXR(-1)	0.025595	0.00538	4.75342
C	-5.089604	1.73400	-2.93518

RGDP = -5.09 + 0.812M2/GDP + 3.957P/TDS – 0.157LDS +0.127LR +0.018SMR – 0.027INF + 0.026EXR

***Corresponding Author:** Yua Henry

The result in Table 12 shows that all the explanatory variables except loan-deposit spread and inflation have positive effect on economic growth (*RGDP*) in the long-run. Also, all the variables are statistically significant at 5% level. It is evident from the result that *M2/GDP* (financial depth), *P/TDS* (financial access) and *LR* (financial stability) have positive and statistically significant effect on economic growth in Nigeria. A one percent increase in these measures of financial development leads to a positive change in the long-run economic growth by 0.811947 percent, 3.956608 percent and 0.127402 percent respectively. On the other hand, the result reveals a negative relationship between LDS (financial efficiency) and RGDP (economic growth) in Nigeria. A one percent increase in LDS (financial efficiency) leads to a reduction in the long-run RGDP (economic growth) by 0.157230 percent. This entails that the closer the gap between lending and deposit rate, the better for long-run economic growth in Nigeria.

Similarly, the result reveals that SMR (Stock Market Returns) have positive and significant relationship with RGDP (economic growth) in the long-run in Nigeria. A one percent increase in stock market returns leads to increase in long-run economic growth by 0.017947 percent. The study also found a positive and significant relationship between exchange rate and long-run economic growth in Nigeria, as well as a negative and significant relationship between inflation and long-run economic growth in Nigeria.

Vector Error-Correction Model

Having reached conclusions on the inherent long-run relationships, we proceed to investigate the short-run dynamics of the RGDP equation. The existence of cointegration among the I(1) variables entails the presence of short-run error correction relationship associated with them. The relationship represents an adjustment process by which the deviated actual RGDP is expected to adjust back to its long-run equilibrium path (Takaendesa, 2005). The results of the VECM of short run dynamics are presented in Table 13

Table 13: Short-run Dynamic Estimates of VECM Normalised on RGDP

Parameters	Coefficient	Standard Error	t-Statistic
Δ RGDP(-1)	0.756618	0.11184	6.76521
Δ M2/GDP(-1)	0.012036	0.00396	3.03939
Δ P/TDS(-1)	0.067004	0.02183	3.06935
Δ LDS(-1)	0.040115	0.00626	6.40815
Δ LR(-1)	-0.191505	0.04016	-4.76855
Δ SMR(-1)	0.227105	0.06115	3.71390
Δ INF (-1)	-0.024136	0.00705	-3.42355
Δ EXR (-1)	0.044718	0.01004	4.45398
ECM(-1)	-0.516121	0.10044	-5.13860

Adjusted R-squared = 0.756300 F-Statistic = 25.05135

The result from Table 13 shows that M2/GDP (financial depth), P/TDS (financial access) and LDS (financial efficiency) are positive and statistically related to short-run RGDP (economic growth) in Nigeria while LR (financial stability) is negative and statistically significant to RGDP (economic growth) in Nigeria. A one per cent increase in M2/GDP (financial depth), P/TDS (financial access) and LDS (financial efficiency) lead to positive change in economic growth by 0.012036 percent, 0.067004 percent and 0.040115 percent respectively. On the other hand, one percent increase in LR financial stability) leads to negative effect on short-run economic growth by 0.191505.

Also, the result shows that SMR (stock market returns) have positive and significant relationship with RGDP (economic growth) in the short-run in Nigeria. A one percent increase in SMR (stock market returns) leads to 0.227105 percent increase in RGDP (economic growth) in the short-run economic in Nigeria. The result shows negative relationship between inflation and economic growth in Nigeria. One percent increase in inflation decreases economic growth by 0.024136 percent. Contrary to expectations, the results reveal a positive relationship between exchange rate and short-run economic growth in Nigeria.

The magnitude of the error-correction term reveals the change in economic growth per period that is attributable to the disequilibrium between the actual and equilibrium levels. The reported speed of adjustment is negative and statistically significant with a coefficient of -0.516121 indicating that about 51.6% of adjustment to the equilibrium level of real gross domestic product occurs annually in Nigeria. In other words, the speed of adjustment implies that, about 51.6% of the disequilibrium in real gross domestic product will be corrected annually for the long-run relationship to be established.The dynamics of the short run coefficients are better explained by the impulse response function in Figure 3.

Diagnostic and Stability Tests

Before drawing conclusions/policy inference from the estimated regression, it is important to perform residual diagnostic and stability tests to ascertain the validity of the underlying assumptions. The diagnostic tests of VEC Residual Serial Correlation LM Tests and VEC Residual Heteroskedasticity Tests were conducted while the stability test of inverse roots of AR characteristic polynomial was estimated.

VEC Residual Serial Correlation LM Tests

To test for serial correlation among the residuals, the LM test was conducted and the results are shown Table 14

***Corresponding Author:** Yua Henry

Table 14: VEC Residual Serial Correlation LM Tests

Null hypothesis: No serial correlation at lag h						
Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	66.67312	64	0.3852	1.045045	(64, 537.1)	0.3875
2	80.37237	64	0.0812	1.275381	(64, 537.1)	0.0823

Null hypothesis: No serial correlation at lags 1 to h						
Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
1	66.67312	64	0.3852	1.045045	(64, 537.1)	0.3875
2	148.2671	128	0.1063	1.174378	(128, 618.4)	0.1112

*Edgeworth expansion corrected likelihood ratio statistic.

The result showed that there is absence of serial/autocorrelation among the residuals since the null hypothesis of no serial or autocorrelation is accepted at 0.05 level of significance for both lags 1 and 2. That is, the LM-statistics (LRE*stat and Rao F-stat) are not statistically significant (probability values are more than 0.05).

VEC Residual Heteroskedasticity Tests

To test for heteroskedasticity among the residuals, the Levels and Squares joint test was conducted and the results is presented in Table 15

Table 15: VEC Residual Heteroskedasticity Tests (Levels and Squares)

Joint test:		
Chi-sq	Df	Prob.
1369.709	1224	0.0622

The joint test of the VEC residual heteroscedasticity test show that there are equal variances among the residuals in the VAR model given that the probability value of the test statistic (Chi.sq) is greater than 0.05 which implied the acceptance of the null hypothesis of absence of heteroskedasticity.

Stability Test

The stability of the VAR model was investigated using the inverse roots of AR characteristic polynomial presented in Figure 2

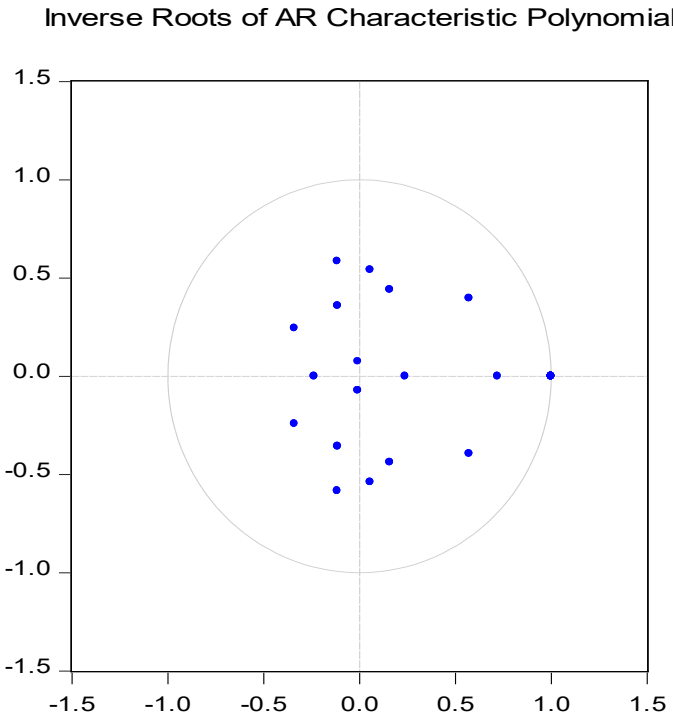

Figure 2: Inverse Root of AR Characteristics Polynomial
Source: Graphs Using E-view Statistical Package, Version 10

***Corresponding Author:** Yua Henry

The result shows that the VAR is relatively stable since all dots are within the circle except one of it that is exactly on the circumference of the circle. The reverse would be the case if the dots lie outside of the circled region. Given that all the diagnostics and stability tests validated the good performance of the specified VAR model, it can therefore be concluded that, inferences and policy decisions can be drawn from the results of the model.

Impulse Response Function

Impulse response functions trace the effect of a shock emanating from an endogenous variable to the other variables in the VECM. It traces the responses of the system variables to one standard deviation shocks and to the system innovations spanning over the ten (10) quarters. The impulse response function for the model is analyzed in Figure 3.

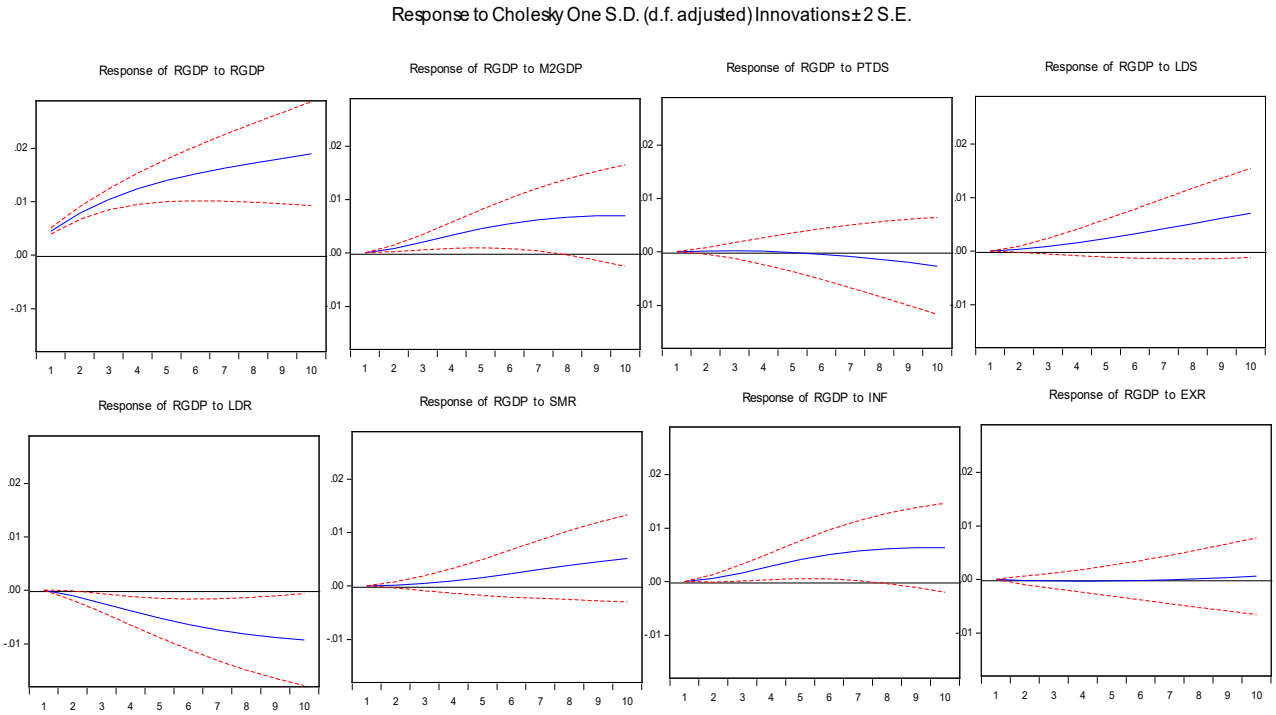

Figure 3: Impulse Response Function of Real GDP to shocks in M2/GDP, P/TDS, LDS, LR, SMR, INF, EXR
Source: Graphs Using E-view Statistical Package, Version 10

The result of the impulse response function in Appendix 25 shows that each variable responds significantly to its own shocks. However, Figure 3 represents the response to real GDP to its own shocks and shocks in the independent variables. The figure reveals that RGDP responds positively to its own shocks all through the ten quarters. Similarly, RGDP responds positively to shocks in M2/GDP (financial depth), LDS (financial efficiency) and inflation all through the ten quarters but less than the response to own shocks. On the other hand, RGDP responds negatively to shocks in LR (financial stability) and EXR (exchange rate) starting from the first quarter in the LR and second quarter in the EXR. Also, the positive response of RGDP to shocks in P/TDS (financial access) was marginal up till the seventh quarter where the response became negative through to the tenth quarter. Similarly, the response of RGDP to shocks in SMR (stock market returns) was very marginal, showing no significant change all through the tenth quarters. This result conforms to the short run result in Table 13.

Granger Causality Test

In order to achieve the five objectives of the study, the Pairwise Granger Causality test was conducted and the result is presented in Table 16.

Table 16: Pairwise Granger Causality Tests

Pairwise Hypothesis	Obs	F-statistics	P-Value	Decision	Type of Causality
M_2/GDP↗RGDP	126	3.57718	0.0312	Reject Ho	Bidirectional
RGDP ↗ M_2/GDP	126	6.22727	0.0027	Reject Ho	Bidirectional
P/TDS↗RGDP	126	0.19253	0.8251	Do Not Reject HO	No causality
RGDP ↗ P/TDS	126	4.28967	0.0159	Reject Ho	Unidirectional Causality
LDS ↗RGDP	126	3.56716	0.0328	Reject Ho	Unidirectional Causality
RGDP↗ LDS	126	0.07888	0.9242	Do Not Reject HO	No causality
LR ↗RGDP	126	4.79546	0.0204	Reject Ho	Unidirectional Causality
RGDP↗ LR	126	0.33446	0.7164	Do Not Reject HO	No causality

***Corresponding Author:** Yua Henry

SMR ↗RGDP	126	0.01287	0.9872	Do Not Reject HO	No causality
RGDP↗ SMR	126	3.77735	0.0256	Reject Ho	Unidirectional Causality
INF ↗RGDP	126	3.98014	0.0201	Reject Ho	Unidirectional Causality
RGDP↗ INF	126	1.67869	0.1881	Do Not Reject HO	No causality
EXR ↗RGDP	126	1.91912	0.1512	Do Not Reject HO	No causality
RGDP↗ EXR	126	6.59434	0.0019	Reject Ho	Unidirectional Causality

Source: Author's Computation using Eviews 10

The result of the Granger causality test in Table 16 reveals bidirectional causality between M_2/GDP (financial depth) and RGDP (economic growth), a unidirectional causation between P/TDS (financial access) and RGDP (economic growth) with causation running from RGDP to P/TDS. The result also reveals a unidirectional causation between LDS (financial efficiency) and RGDP (economic growth) with causation running from LDS to RGDP. Similarly, the study found a unidirectional causation between LR (financial stability) and RGDP (economic growth) with causation running from LR to RGDP. A unidirectional causation was also found between SMR (stock market returns) and RGDP (economic growth) running from RGDP to SMR. On the other hand, causation between INF (inflation) and RGDP (economic growth) indicate a unidirectional relationship running from INF to RGDP while causation between EXR (exchange rate) and RGDP (economic growth) is also unidirectional and run from RGDP to EXR.

Hypotheses Testing

The five null hypotheses of the study are tested at 0.05 (5%) level of significance.

Decision Rule*:* Reject the null hypotheses if the probability value (p-value) of the variable of interest is less than 0.05 (5%) level of significance.

Hypothesis One

In order to achieve objective one of the study, the null hypothesis of the study stated as "there is no significant causal relationship between ratio of money supply to GDP (M2/GDP) and economic growth in Nigeria" was tested using the Pairwise Granger Causality Results in Table 16.

Decision: The result in Table 16 indicate that the probability values (p-value) of the pairwise causality between M_2/GDP (financial depth) and economic growth (RGDP) is 0.0312 and between RGDP (economic growth) and M_2/GDP (financial depth) is 0.0027, both of which are less than 0.05 level of significance. It means that the p-values are significant; thus, we reject the null hypothesis of no significant causal relationship between ratio of money supply to GDP (M_2/GDP) and RGDP (economic growth) in Nigeria and conclude that, there exists a significant causal relationship between M_2/GDP and RGDP in Nigeria. Hence, M_2/GDP influences or affects RGDP and the converse is also true. Thus, it means that Granger causality is bidirectional between the series, M_2/GDP and RGDP, with causality running from M_2/GDP to RGDP and from RGDP to M_2/GDP.

Hypothesis Two

In order to achieve objective two of the study, the null hypothesis stated as "Ratio of private debt to total debt securities (P/TDS) has no significant causal relationship with economic growth in Nigeria" was tested using the Pairwise Granger Causality Results in Table 16.

Decision: The results of the p-value in Table 16 testing the causal relationship between P/TDS (financial access) and RGDP (economic growth) is 0.8251. The p-value of 0.8251 is insignificant because it is greater than 5% significance level, hence we accept the null hypothesis and conclude that P/TDS (financial access) does not Granger cause RGDP (economic growth). However, the converse is not true between P/TDS and RGDP as the P-value of 0.0159 is significant because it is less than 0.05 or 5% level of significance. Hence, we reject the null hypothesis, and conclude that RGDP Granger cause P/TDS. Thus, RGDP influences or affect P/TDS but P/TDS does not influence or affect RGDP. It means that the Granger causality is unidirectional between the series, P/TDS and RGDP, with causality running from RGDP to P/TDS and not the other way. These suggest that improvement in economic growth would lead to increase in economic activities and thus engender the degree to which individuals can and would have access to financial services Nigeria.

Hypothesis Three

In order to achieve objective three of the study, the null hypothesis stated as "There is no significant causal relationship between lending-deposit spread (LDS) and economic growth in Nigeria" was tested using the Pairwise Granger Causality Results in Table 16.

Decision: The p-value of 0.0328 in Table 16 expressing the causal relationship between LDS (financial efficiency) and RGDP (economic growth) is significant because it is less than 5% level of significance. So, we reject the null hypothesis of no significant causal relationship between lending-deposit spread (LDS) and economic growth in Nigeria and conclude that, LDS Granger cause RGDP in Nigeria. But the converse is not true between the p-value of RGDP and LDS of 0.9242 which is insignificant because it is greater than 5% level of significance. So, we cannot reject the null hypothesis and therefore conclude that RGDP does not Granger

cause LDS in Nigeria. Hence, LDS influences or affect RGDP but the reverse is not the case. It means that Granger causality is unidirectional between the series, LDS and RGDP, with causality running from LDS to RGDP and not the other way. It therefore suggests that economic growth can be achieved by improving financial efficiency among financial institutions, intermediaries and markets in intermediating resources and facilitating financial transaction.

Hypothesis Four

To achieve objective four of the study, the null hypothesis stated as "liquidity ratio (LR) has no significant causal relationship with economic growth in Nigeria" was using the Pairwise Granger Causality Results in Table 16.

Decision: The result of Table 16 show that the p-value of 0.0204 between LR (financial stability) and RGDP (economic growth) is significant because it is less than 5% level of significance. Hence, we reject the null hypothesis and conclude that LR Granger cause RGDP. But the converse is not true of the p-value of 0.7164 between RGDP and LR which is greater than 5% level of significance and insignificant. It means that RGDP does not Granger cause LR. Thus, LR influences or affects RGDP but the reverse is not the case which presupposes that Granger causality is unidirectional between the series, LR and RGDP, with causality running from LR to RGDP and not the other way. This entails that financial stability is an important variable in achieving economic growth and should be taken seriously by the regulatory authorities.

Hypothesis Five

To achieve objective five of the study, the null hypothesis stated as "There is no significant causal relationship between stock market returns and economic growth in Nigeria" was tested using the Pairwise Granger Causality Results in Table 16

Decision: The results of Table 16 show that the p-value of 0.9872 between SMR (stock market returns) and RGDP (economic growth) is insignificant because it is greater than 5% level of significance. Thus, we cannot reject the null hypothesis that there is no significant causal relationship between stock market returns and economic growth in Nigeria and conclude that SMR does not Granger cause RGDP. But the converse appears not true between SMR and RGDP with a p-value of 0.0256 which is significant because the p-value is less than 5% level of significance. So, we reject the null hypothesis, and conclude that RGDP Granger cause SMR. Thus, RGDP influences or affects SMR but the converse is not true. It means that Granger causality is unidirectional between the series, SMR and RGDP, with causality running from running from RGDP to SMR.

Discussion of Findings

The findings of the study reveal bidirectional causality between M2/GDP (financial depth) and RGDP (economic growth) in Nigeria. The bidirectional relationship supports both supply-leading hypothesis (M2/GDP Granger cause RGDP) and demand-following hypotheses (RGDP Ganger cause RGDP) between the series in Nigeria.

The study also found a unidirectional causation between financial access (P/TDS) and economic growth (RGDP) with causation running from RGDP to P/TDS. The findings support the demand following hypothesis in Nigeria.

The result reveals a unidirectional causation between LDS (financial efficiency) and RGDP (economic growth) with causation running from LDS to RGDP. The findings support the supply leading hypothesis in Nigeria. It means that lending to deposit spread (a proxy of financial development) has significant influence on economic growth.

The study found a unidirectional causality between LR (financial stability) and RGDP (economic growth) with causality running from LR to RGDP. This finding supports the supply leading hypothesis in Nigeria. It means that Liquidity ratio (proxy for financial development) has significant influence on economic growth or can predict economic growth.

The study found a unidirectional relationship between SMR and RGDP with causation running from RGDP to SMR. The findings support the demand leading hypothesis in Nigeria.

SUMMARY OF FINDINGS

- The ratio of money supply to GDP (M_2/GDP) has a significant and bi-directional causal relationship with RGDP (economic growth) which supports both supply leading hypothesis and demand following hypothesis in Nigeria for the period under review;
- The ratio of private debt to total debt securities (P/TDS) has an insignificant and unidirectional causal relationship with RGDP (economic growth) with causality running from RGDP to P/TDs which supports demand following hypothesis in Nigeria for the period under study;
- The Lending-deposit spread (LDS) has a significant and unidirectional causal relationship with RGDP (economic growth) with causality running from LDS to RGDP which supports supply leading hypothesis in Nigeria for the period under review;
- The Liquidity ratio (LR) has a significant and unidirectional causal relationship with RGDP (economic growth) with causality running from LR to RGDP which supports supply leading hypothesis in Nigeria for the period under review; and

***Corresponding Author:** Yua Henry

- The stock market returns (SMR) has an insignificant and unidirectional causal relationship with RGDP (economic growth) and causality running from RGDP to SMR which supports demand following hypothesis in Nigeria for the period under study.

CONCLUSION

It employed robust techniques such as Exponential General Autoregressive Conditional Heteroskedasticity (E-GARCH), Vector Autoregressive (VAR) models and Granger Causality test. The descriptive statistics of the model variables was examined using mean, standard deviation, minimum and maximum values as well as Jaque Bera statistics test of normality. The Augmented Dickey Fuller test was used to examine the unit root properties of the series and the result indicates that all the variables became stationary only after first differencing. This led to the use of Johansen cointegration test in testing for the long-run relationship or cointegration which revealed two cointegrating equations. Further, the econometric results reveal that the major determinants of economic growth measured by real GDP in Nigeria include past real GDP, M_2/GDP (financial depth), P/TDS (financial access), LDS (financial efficiency), and LR (Financial stability), stock market returns as well as inflation and exchange rates.

The study came up with mixed findings – bidirectional causality supporting both supply-leading and demand following hypotheses and unidirectional causality supporting either supply leading hypothesis or demand following hypothesis. The study therefore concludes that, financial development and stock market returns are crucial for the growth of the Nigerian economy.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

- The study recommends promoting financial development and economic growth in Nigeria by implementing financial reforms and focusing on a robust financial system, legal system, and business environment for quality investments, real sector growth, and job creation.
- The study recommends Nigeria's government should implement policies to improve financial inclusion, access, capital accumulation, credit creation, economic activities, investment, and growth. It suggests introducing concessionary intervention funds targeted at critical sectors like agriculture, manufacturing, and mining, channeled through deposit money banks to Small and Medium Enterprises (SMEs), which are key engines of economic growth.
- The study recommends strengthening of Nigeria's forward-looking approach to bank regulation and supervision to maintain adequate liquidity ratios, enhancing banks' capacity to meet financial obligations, withstand short-term pressures, boost trust, and maintain financial system stability.
- The study recommended that RGDP Granger can lead to stock market returns, indicating the financial system's sensitivity. It recommends a risk-based approach for listed companies, early identification of risks, and sound corporate governance. The economy should also focus on the ease of doing business in the stock market, as it provides cheap long-term funding. This could involve reducing the cost of doing business in both primary and secondary markets.
- The study suggests that financial development and economic growth are bidirectional, supporting both supply-leading and demand hypotheses. To achieve price stability and accelerated growth, attention should be given to money supply, economic growth determinants like investment, human capital development, and research.

REFERENCES

1. Ahmad, A. U., Adam, A., Ahmad, T. A., & Umar, A. M. (2015). Stock market returns and macroeconomic variables in Nigeria: Testing for dynamic linkages with a structural break. *Scholars Academic and Scientific Publishers, 2*(8A), 816–828.
2. Akingunola, R. O., Olusegun, A. A., Oluwaseyi, B., & Olusoyi, S. G. (2013). The effect of the financial liberalisation on economic growth. *International Journal of Academic Research in Economics and Management Sciences, 2*(1), 123–155.
3. Ajekwe, T., Yua, H., & Tyona, T. (2024). Alternative securities market and long-term capital market financing in Nigeria. *International Journal of Development and Economic Sustainability, 12*(2), 1–26.
4. Ajekwe, T., Yua, H., Epor, S. O., & Victor, U. (2024). Exploring the new financing initiative for SMEs: The role of Nigeria's Alternative Securities Market (ASeM). *International Journal of Economics and Financial Management, 9*(3), 26–37.
5. Al-Rjoub, S. A., & Azzam, H. (2012). Financial crises, stock returns and volatility in an emerging stock market: The case of Jordan. *Journal of Economic Studies, 39*(2), 178–211.
6. Arestis, P. (2006). Financial liberalization and the relationship between finance and growth. *A Handbook of Alternative Monetary Economics*.
7. Arestis, P., Demetriades, P. O., & Luintel, K. B. (2001). Financial development and economic growth: The role of stock markets. *Journal of Money, Credit and Banking, 33*, 16–41.
8. Asemota, O. J., & Ekejiuba, U. C. (2017). An application of asymmetric GARCH models on volatility of banks equity in Nigeria's stock market. *CBN Journal of Applied Statistics, 8*(1), 73.

***Corresponding Author:** Yua Henry

9. Akwam, P. O., & Yua, H. (2021). Effect of financial products on the performance of selected deposit money banks in Nigeria: 2005–2019. *European Journal of Accounting, Auditing and Finance Research, 9*, 124–143.
10. Beck, T., & Levine, T. (2003). Stock markets, banks, and growth: Panel evidence. *Journal of Banking and Finance, 28*(3), 423–442.
11. Beck, T., Demirguc-Kunt, A., & Levine, R. (2003). Law, endowments and finance. *Journal of Financial Economics, 70*(2), 137–181.
12. Demetriades, P. O., & Hussein, K. A. (1996). Does financial development cause economic growth? Time-series evidence from 16 countries. *Journal of Development Economics, 51*(2), 387–412.
13. Dickey, D. A., & Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root. *Journal of the American Statistical Association, 74*, 427–431.
14. Dritsaki, C., & Dritsaki, B. M. (2005). The causal relationship between stock, credit market and economic development: Empirical evidence of Greece. *Economic Change and Restructuring, 38*, 113–127.
15. Emenuga, C. (1997). Development of stock markets in Sub-Saharan Africa. *African Development Review, 9*(1), 156–185.
16. Ejinkonye, R. C., Yua, H., Nwanko, B. C., & Mbanefo, P. A. (2023). Effect of financial inclusion on financial intermediation in Nigeria: 2000–2021. *Journal of Management Science, 60*(60), 337–350.
17. Epor, O. S., Yua, H., & Nwakoby, C. (2023). Fiscal policy, private investment and manufacturing sector performance: Empirical evidence from Nigeria with ARDL technique. *African Journal of Economics and Sustainable Development, 6*(1), 137–151.
18. Epor, S. O., Yua, H., & Utor, E. (2023). Exploring the asymmetric impacts of inflation on interest rate spread: Evidence from Nigeria with nonlinear ARDL and asymmetric causality. *African Banking and Finance Review Journal, 7*(7), 100–119.
19. Gbemisola, O., Ayotunde, A. A., Yua, H., & Oluwaseun, E. E. O. (2022). Exploring the effectiveness of entrepreneurship development programs (EDS) on graduated students' intention towards self-employment. *International Conference on Innovative and Advances in Interdisciplinary Research, Mewar University.*
20. Ityavyar, D. V., & Yua, H. (2023). The influence of International Financial Reporting Standards on financial performance and taxation of selected listed firms in Nigeria. *British Journal of Management and Marketing Studies, 6*(1), 51–67.
21. Ghirmay, T. (2006). Financial development, investment, productivity and economic growth. *US Southwestern Economic Review, 33*(1), 23–40.
22. Guo, H. (2002). Stock market returns, volatility, and future output. *The Federal Reserve Bank of St. Louis, 84*, 75–86.
23. Hassan, K., Sanchez, B., & Yu, J. (2011). Financial development and economic growth: New evidence from panel data. *The Quarterly Review of Economics and Finance, 51*, 88–104.
24. Hermes, N., & Lensink, R. (2000). Foreign direct investment, financial development and economic growth. *Journal of Development Studies, 40*(1), 83–116.
25. Hossain, M. (2010). Financial reforms and persistently high bank interest spreads in Bangladesh: Pitfalls in institutional development? Retrieved from http://mpra.ub.unimuenchen.de/24755/1/Hossain_IRS.pdf
26. Hunjra, A. I., Chani, M. I., Ijaz, M. S., Farooq, M., & Khan, K. (2014). The impact of macroeconomic variables on stock prices in Pakistan. *Munich Personal RePEc Archive Paper No. 60791.* Online at http://mpra.ub.uni-muenchen.de/60791/
27. Ikoku, E. I., & Okorie, G. O. (2010). The performance of the Nigerian Stock Exchange sectoral indices: January 2009 – December 2010. *Central Bank of Nigeria Bullion*.
28. Izunobi, A. O., Nzotta, S. M., Ebiringa, O. T., Akujuobi, A. B. C., & Chigbu, E. E. (2017). Macroeconomic variables volatility in the Nigerian stock market: An empirical analysis. *International Journal of Managerial Studies and Research, 5*(6), 1–13.
29. Khan, M. A., & Qayyum, A. (2006). Trade liberalization, financial sector reforms, and growth. *The Pakistan Development Review, 45*(4), 2–38.
30. Kibria, U., Mahmood, Y., Kamran, M., Arshad, M. U., Perveen, R., & Sajid, M. (2014). The impact of macroeconomic variables on stock market returns: A case of Pakistan. *Research Journal of Management Sciences. ISSN, 2319*, 1171.
31. King, R. G., & Levine, R. (1993). Finance and growth: Schumpeter might be right. *The Quarterly Journal of Economics, 108*(3), 717–738.
32. Klein, M., & Olivei, G. (1999). Capital account liberalization, financial depth, and economic growth. *Working Paper No. 99-6, Federal Reserve Bank of Boston.*
33. Ndako, U. B. (2010). Stock markets, banks and economic growth: Time series evidence from South Africa. *The African Finance Journal, 2*, 72–92.
34. Nkoro, E., & Aham, K. U. (2013). Financial sector development–economic growth nexus: Empirical evidence from Nigeria. *American International Journal of Contemporary Research, 3*(2), 87–94.
35. Nnachi, D. N., & Nnamani, C. U. (2017). Estimating the causal relationship between financial development and economic growth in Nigeria. *Journal of Economics and Finance, 8*(3), 47–55.
36. Nouren, A. (2009). The causality between financial development and economic growth in Kenya. *MPRA Paper 49, 262, University Library of Munich, Germany.*

***Corresponding Author:** Yua Henry

37. Nwanna, I. O. (2017). Impact of capital market volatility on economic growth in Nigeria (1985–2016). *Journal of Economics and Finance, 8*(4), 1–25.
38. Nzomo, T. J., & Dombou-Tagne, D. R. (2017). Stock markets, volatility and economic growth: Evidence from Cameroon, Ivory Coast and Nigeria. *Panorama Económico, Escuela Superior de Economía, Instituto Politécnico Nacional, 12*(24), 145–175.
39. Nzotta, S., & Okereke, E. (2009). Financial deepening and economic development of Nigeria: An empirical investigation. *African Journal of Accounting, Economics, Finance and Banking Research, 5*(5).
40. Odo, S. I., Ogbonna, B. C., Agbi, P. E., & Anoke, C. I. (2016). Investigating the causal relationship between financial development and economic growth in Nigeria and South Africa. *Journal of Economics and Finance, 7*(2), 75–81.
41. Omale, E. A., Yua, H., & Azubuike, P. E. (2024). Effect of money market instruments on banking soundness in Nigeria. *Journal of Business and African Economy, 10*(2), 77–100.
42. Odeniran, S. O., & Udeaja, E. A. (2010). Financial sector development and economic growth: Empirical evidence from Nigeria. *Economic and Financial Review, 48*(3), 90–123.
43. Odhiambo, N. M. (2007). Supply-leading versus demand-following hypothesis: Empirical evidence from three SSA countries. *African Development Review, 19*, 257–280.
44. Ogiriki, T., & Andabai, P. W. (2014). Financial intermediation and economic growth in Nigeria, 1988–2013: A vector correction investigation. *Mediterranean Journal of Social Sciences, 5*(17), 19–26.
45. Okpara, G. C. (2010). The effect of financial liberalization on selected macroeconomic variables: Lessons from Nigeria. *The International Journal of Applied Economics and Finance, 2*(1), 1–9.
46. Omankhanlen, A. E. (2012). The financial sector reforms and their effect on the Nigerian economy. *Economy Transdisciplinarily Cognition, 15*, 45–57.
47. Osamwonyi, I. O., & Evbayiro-Osagie, E. I. (2012). The relationship between macroeconomic variables and stock market index in Nigeria. *Journal of Economics, 3*(1), 55–63.
48. Patrick, H. T. (1966). Financial development and economic growth in underdeveloped countries. *Economic Development and Cultural Change, 14*, 174–189.
49. Poon, S. H., & Granger, C. W. (2003). Forecasting volatility in financial markets: A review. *Journal of Economic Literature, 41*(2), 478–539.
50. Rajan, R. G., & Zingales, L. (2003). The great reversals: The politics of financial development in the twentieth century. *Journal of Financial Economics, 69*(1), 5–50.
51. Ritter, J. R. (2005). Economic growth and equity return. *Pacific-Basin Finance Journal, 13*(5), 489–503.
52. Shaw, E. S. (1973). *Financial Deepening in Economic Development.* London and New York: Oxford University Press.
53. Sikalao-Lekobane, O. L., & Lekobane, K. R. (2014). Do macroeconomic variables influence domestic stock market price behaviour in emerging markets? A Johansen cointegration approach to the Botswana Stock Market. *Journal of* [incomplete].
54. Torruam, J. T., Chiawa, M. A., & Abur, C. C. (2013). Financial deepening and economic growth in Nigeria: An application of cointegration and causality analysis. *3rd International Conference on Intelligent Computational Systems*, 20–26.
55. Voghouei, H., Azali, M., & Jamali, M. A. (2011). A survey of the determinants of financial development. *Asian-Pacific Economic Literature, 25*(2), 1–20.
56. World Bank. (2012). *Global financial development report 2013: Rethinking the role of the state in finance.* Washington, DC: World Bank. Retrieved from http://www.worldbank.org/financialdevelopment
57. Wuave, T., Yua, H., & Yua, P. M. (2020). Effect of liquidity management on the financial performance of banks in Nigeria. *European Journal of Business and Innovation Research, 2*(1), 33–51.
58. Yua, H. (2025). Corporate venturing and manufacturing firms' growth: Evidence from selected companies in the Benue State. *World Journal of Entrepreneurial Development Studies, 10*(2), 132–157.
59. Yua, H., & Temitope, A. O. (2024). Effect of risk management on financial institutions in Sub-Saharan Africa: A critical review of Nigeria and Mozambique. *British International Journal of Applied Economics, Finance and Accounting, 8*(3), 59–79. Retrieved from https://aspjournals.org/Journals/index.php/bijaefa/article/view/673
60. Yua, H., Epor, S. O., & Utor, V. (2023). The sway of financial markets on economic growth: Evidence from Nigerian Stock Exchange. *Development Multidisciplinary International Journal, 7*(1), 84–92.

***Corresponding Author:** Yua Henry