



Financial Development, Trade Openness, and Economic Growth in Nigeria

Joshua Adeyemi Afolabi^{a,*}

a. Nigerian Institute of Social and Economic Research (NISER), Ibadan, Nigeria

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Abstract

This study examined the impact of financial liberalization and trade openness as well as their interactive effects on the growth of the Nigerian economy using annual time-series data for the period, 1981 to 2018. The results of the Augmented Dickey-Fuller (ADF) unit root test show that all the variables are stationary at the first difference and the Johansen cointegration test results confirm the existence of a long-run relationship among the variables in the model. Two equations were specified and estimated using the dynamic ordinary least square (DOLS) estimation technique and the granger causality test was carried out. The results reveal that financial development, exchange rate, and interest rate spread have a significant influence on real GDP in Nigeria while trade openness, as well as its interaction with financial development, do not exert any significant impact on economic growth in Nigeria. Further, this study supports the demand-following and trade-led growth hypotheses. Hence, this study recommends the design and implementation of a policy framework geared towards enhancing the intermediation efforts and deposit mobilization of the financial sector that would instigate the integration of the sector with the various productive sectors of the Nigerian economy and that trade performance in the country to be improved through economic diversification so as to boost exports, raise the country competitiveness and increase her national output.

Keywords: Financial Development, Trade Openness, Economic Growth, Dynamic OLS, Nigeria.

JEL Classification: C22, F10, G20, O40.

Introduction

The pivotal roles financial development and trade openness play in bolstering economic growth across countries cannot be overemphasized. International trade theories posit that differences in technology, factor endowments, and economies of scale, among others, across countries are the main sources of comparative advantage and determinants of trade patterns. Moreover, it has been argued that financial development is a potential source of comparative advantage to an economy, thus it can facilitate trade (Kletzer and Bardhan, 1987; Baldwin, 1989). Intuitively, a country with a relatively well-regulated, well-developed and efficient financial sector has comparative advantage in sectors that depend on external financing. Hence, countries with well-developed financial sector should experience greater volumes of international trade (Beck, 2002; 2003; Svaleryd and Vlachos, 2005; Hur et al., 2006). This accounts for the great volume of trade witnessed in China, Germany, United States, and United Kingdom, among other developed countries of the world. Thus, to experience greater volumes of international trade, it is expedient that each country especially developing economies aim at having a well-regulated and competitive financial sector.

The Nigerian government had made several efforts toward developing its financial sector

*. Corresponding author email: j.ogunjimi@niser.gov.ng

as reflected in the different reforms in the sector over time even though there had been inconsistency in implementing the policies. These policy reforms were aimed at maintaining a stable, well-regulated, and competitive financial sector. The 1986 reform was borne out of the repression witnessed in the financial sector of the Nigerian economy at that time and was a component of the Structural Adjustment Program (SAP) of the World Bank and International Monetary Fund (IMF). However, the SAP reform failed in that the link between the financial sector and the economy was very weak and this ushered in the 2004 reform when the Central Bank of Nigeria (CBN) required that the minimum capital base of all deposit banks be raised from about ₦ 2 billion to ₦ 25 billion before December 2005. This reform was adjudged successful as it was complemented by improved regulatory and oversight function by the Central Bank. However, the extremely fragile nature of the Nigerian financial sector was hit by the global financial crisis and recession, and this led to the formulation of the 2009 reforms as the Central Bank unveiled a ten-year reform blueprint anchored on four cardinal reform programs aimed at stabilizing the financial sector of the economy.

Similarly, since the adoption of SAP in 1986 until date, Nigeria has pursued liberal trade policies (import substitution and export promotion strategies) including the adoption of a flexible exchange rate regime and the implementation of a broad-based and comprehensive tariff system. The effect of the trade liberalization policy was that the share of agriculture in total GDP increased markedly from 30 percent in 1998 to 36 percent and 42 percent in 2000 and 2007 respectively while the share of the petroleum sector in total GDP also increased during the period. However, despite the improved contribution of these sectors to GDP, these sectors have no structural linkage with the industrial sector as the productivity of the industrial sector stagnated and unemployment continued to soar (Onyeiwu, Lorgulecu, and Polimeni, 2009). In addition, the implementation of the trade liberalization policy led to a fall in the lending rate, a rise in external reserve, an appreciation of the exchange rate as well as a surplus current account position for most of the period (CBN, 2018).

However, the trade liberalization policies yielded positive outcomes as the Nigerian economy became more open to international trade while the financial institutions (especially banks) still performs below expectations especially with regards to the mobilization of savings to finance real sector development projects (Adeoye and Adewuyi, 2005). In addition, the financial institutions in the Nigerian economy has been adjudged weak, ineffective and uncompetitive as there seems to be no obvious contribution of the sector to Nigeria's growth and development especially in the post-SAP era (Ayadi, Adegbite and Ayadi, 2008; Ayadi, 2009).

The literature is replete with country-specific, region-based as well as cross-country studies on the link between financial development and economic growth for different countries of the world, a body of knowledge that had led to testing the supply-leading hypothesis, demand-following hypothesis, feedback hypothesis and neutral hypothesis [Yucel, 2009 (Turkey); Adusei and Nkrumah, 2013 (Ghana); Rana and Barua, (5 South Asian Countries); Calderon and Liu, 2003 (109 Developing and Industrial Countries); Ndebbio, 2004 (Sub-Saharan African countries); Johannes et al, 2011 (Cameroon); Khan, 2008 (Pakistan); Ndlovu, 2013 (Zimbabwe); Michael, 2012 (South Africa); Mohammed and Sidropolous, 2006 (Sudan); Ogwumike and Salisu, 2012 (Nigeria); and Atoyebi et al, 2012 (Nigeria); among others]. Some other studies [Osabuohien, 2007 (ECOWAS Countries); and Atoyebi et al., 2012 (Nigeria), among others] focused on the trade-growth nexus which led to the testing of the trade-led growth hypothesis. From the foregoing, it is apparent that most studies employed a bivariate framework in examining the financial development-growth nexus as well as the trade-growth relationship. The empirical findings of these studies are mixed and inconclusive.

However, only a few studies (Yucel, 2009; Arouri et al., 2013; Rahman et al., 2015; Altaee and Al-Jafari, 2015; Saaed and Hussain, 2015; Khan and Qayyum, 2007; Kar et al., 2014; among others) had been carried out using a trivariate framework in investigating the relationship among financial development, trade openness and economic growth across countries in the world. The studies examining the financial development and growth relationship together with the trade-growth nexus jointly are limited and particularly rare for Nigeria. Danlami et al. (2018) did a similar study but incorporated both the financial instability index and money supply in the same model thereby engendering multicollinearity problems that may invalidate the estimated coefficients and findings of the study. Katircioglu et al. (2007) opined that the impact of financial development and trade openness on economic growth as well as causality among them remains inconclusive in the existing literature. Hence, this study fills the identified gaps in the literature.

Furthermore, Kletzer and Bardhan (1987) and Baldwin (1989) have formally theorized the notion of financial comparative advantage arguing that countries with better financial systems produce and export financially dependent goods. Empirical evidence abounds in the literature that financial comparative advantage influences trade patterns (Beck, 2002; 2003, Becker and Greenberg, 2005; Svaleryd and Vlachos, 2005). Hence, to effectively examine the trivariate relationship between financial development, trade openness, and economic growth, it is needful to examine the interactive effect of the financial development and trade openness variables on economic growth. To the best of my knowledge, studies of this nature are rare in Nigeria.

It is against this background that this study raises the following research questions:

- (i) To what extent have financial development and trade openness influenced economic growth in Nigeria?
- (ii) What is the interactive effect of financial development and trade openness, on economic growth in Nigeria?
- (iii) What is the direction of causality of financial development, trade openness, and economic growth in Nigeria?

The choice of Nigeria for this study is premised on the fact that it is an oil-rich and small open economy with a weak financial sector and moderate economic growth. It therefore becomes imperative to investigate if the economic growth in Nigeria is stimulated or stifled by its weak financial sector or its relative openness to trade. It is noteworthy that the structure of the Nigerian economy is similar to some Middle East countries' including Iran. Hence, the findings from this study could as well apply to Iran and other countries having similar characteristics to Nigeria.

In view of this background, this study aims to examine the relationship between financial development, trade openness, and economic growth in a tri-variate framework. The organization of this study is as follows: Section 1 introduces the study while Section 2 presents the stylized facts on the financial development, trade openness, and economic growth in Nigeria. A review of related literature is the central theme of Section 3 while methodology and empirical analysis form the crux of Section 4. Section 5 comprises the concluding remark and policy recommendations.

Stylized Facts

Table 1 shows the trend of selected financial development variables, trade liberalization variable (trade openness), and GDP growth rate of Nigeria. It shows that all the financial development variables except the saving rate increased markedly for the period under review indicating an increase in financial depth in the country over time. Specifically, the share of broad money in GDP rose from 10.9 percent in 1981 to 12.7 percent and 19.6 percent in 2000

and 2018 respectively, a situation which indicates the increased monetization in the Nigerian economy. Furthermore, the share of credit to the private sector increased from 6.8 percent in 1981 to 7.7 percent and 17.6 percent in 2000 and 2018 respectively. This suggests the increasing importance of commercial banks in channeling idle funds from savers to lenders and it also shows the increased level of private sector participation in the productive activities of the country.

However, it is noteworthy that the saving rate and lending rate went in opposite directions such that as the lending rate was increased, the saving rate was declining. This has great implications for investment and economic growth. High lending rates and low savings rates are disincentives to investors and savers alike, as they would lead to an increase in money supply (as depicted by the upward trend of broad money as a percentage of GDP) and a fall in economic growth (as depicted by the volatility of the GDP growth). It is also important to state that the monetary policy rate has been relatively stable as it has hovered around 8.4 percent to 14 percent for the period under review. The foregoing implies that the various financial reforms implemented in the past have been suboptimal in fostering financial development and economic growth in Nigeria.

Furthermore, it is apparent from the trend of trade openness that the Nigerian economy was not really open until the adoption of policy measures under the structural adjustment program of 1986. Trade openness, which is calculated as the sum of exports and imports as a ratio of GDP, in Nigeria was more pronounced after 1986 as depicted by the upward trend in trade openness such that it stood at 47.8 in 2008 indicating that the Nigeria's GDP is more than twice as high as the volume of trade. This trend could be attributed to the 1995 deregulation policy as well as the final removal of all trade restrictions, a condition which Nigeria was compelled to fulfil before becoming a full-fledge member of World Trade Organization (WTO). The foregoing suggests that the various trade liberalization policies implemented in Nigeria have been successful in opening up the economy to trade with other nations of the world.

Table 1. Trend of Financial Development, Trade Openness and GDP Growth in Nigeria

Macroeconomic Variables	1981	2000	2018
Broad Money (% of GDP)	10.9	12.7	19.6
Credit to Private Sector (% of GDP)	6.8	7.7	17.6
Savings Rate (%)	8.0	5.3	4.1
Maximum Lending Rate (%)	11.6	21.6	31.1
Trade Openness	0.1	13.1	47.8
Commercial Bank Loans and Advances (% of GDP)	0.1	2.1	22.1
Stock Market Capitalization (% of GDP)	0.0	2.0	31.4
GDP Growth Rate (%)	-0.3	5.5	1.9
Monetary Policy Rate (%)	8.4	14.0	14.0

Source: Computed by Author from CBN Statistical Bulletin (2018).

Theoretical Issues and Literature Review

Theoretical Underpinnings

There is an intense debate in the literature on the direction of causality between economic growth and financial development. There are four basic arguments in this regard. The first is the "supply leading hypothesis" indicating that financial development causes economic growth (Schumpeter, 1911; Gurley and Shaw, 1967; McKinnon, 1973; King and Levine, 1993; and Calderon and Liu, 2003); the second is the demand-following hypothesis which

states that economic growth causes financial development (Robinson, 1952; Goldsmith, 1969; Kar and Pentecost, 2000; Omotor, 2007; Ndlovu, 2013); the third is the feedback hypothesis which argues for a bidirectional causality between financial development and economic growth (Yucel, 2009); and the final one is the neutral hypothesis which argues against causality between financial development and economic growth (Apergis and Levine, 2007).

Similarly, there exist a number of theories linking the relationship between trade and economic growth. First is the Hecksher-Ohlin (H-O) model also referred to as the factor-proportion theory which emphasizes the interplay between the proportion of availability of factors of production in different countries and the proportion in which they are used in producing different goods (Krugman et al., 2012). The H-O model postulates that all markets clear as there is macroeconomic equilibrium as well as full employment. The Hecksher-Ohlin neo-classical trade theory emphasizes that developing countries that are labor-intensive will export goods and services that are relatively more labor-intensive and import goods and services that are relatively more capital-intensive. It implies that trade liberalization will help raise relative prices of labor-intensive goods and services thereby increasing the demand for more labor, increasing wage rate as well as employment in the economy. Summarily, the Hecksher-Ohlin neo-classical trade theory argues in support of the trade-led growth hypothesis.

The Stolper-Samuelson theory describes the relationship between relative factor cost and relative prices of output. It states that, under certain economic assumption, there will be a rise in the returns to the most intensively used factor in the production of a good if the relative price of such good increases while there will be a decline in the returns to other factors. It also posits that there will be an increase in demand for skilled labor in a capital-intensive country and a fall in demand for unskilled labor.

Empirical and Methodological Review

The literature is replete with diverse scholarly perspectives on the relationship between financial development and economic growth, the trade-growth nexus as well as the impact financial development and trade openness have on economic growth both in developed and developing economies. While some studies focused on the direction of causality between these macroeconomic variables, others examined the level of impact of trade openness and financial development on economic growth. Different methods have also been employed to evaluate these relationships. Nonetheless, there is no general consensus on these relationships as there are mixed findings in the literature.

Yucel (2009) examined the direction of causality among financial development, trade openness and economic growth of the economy of Turkey using monthly time series data from January 1989 to November 2007. The study employed Granger causality test and Error Correction Model to examine the causal relationships among the variables. The result showed that whereas trade openness has a direct relationship with economic growth, financial development has an inverse relationship with growth. It also revealed the presence of bidirectional relationships among trade openness, financial development and economic growth implying that trade openness and financial development are key determinants of economic growth in Turkey.

Similarly, Aroui et al. (2013) made their contribution to the literature by investigating the relationship between financial development, trade openness and economic growth in Bangladesh using quarterly time series data from the first quarter of 1975 to the last quarter of 2011. The study adopted the Zivot-Andrews structural break unit root test was used to check the stationarity of the variables used in the study while ARDL Bounds test approach to

cointegration and the innovative accounting approach for causality were employed to examine the relationship. The results show a long-run relationship among trade openness, financial development and economic growth in Bangladesh implying that these variables converge in the long-run. They found evidence in support of the supply-leading hypothesis. They also found that economic growth causes imports; financial development and economic growth cause exports; and a feedback effect exists between economic growth and trade openness in Bangladesh.

Rahman et al. (2015) explored the relationship among international trade, financial development and economic growth in Australia using annual time series data between 1965 and 2010. The study employed the Zivot-Andrews structural break unit root test to test the stationarity properties of the variables; the ARDL Bounds test approach to cointegration was used to check for long-run relationship among the series; and the VECM granger causality technique was used in examining the relationship. Evidence confirms the existence of a long-run relationship among the variables. It was also found that international trade, financial development and capital influence economic growth in the short and long run. Furthermore, there is a feedback effect between economic growth and international trade in Australia. The study validates the supply-leading hypothesis in Australia as the results show that financial development causes economic growth.

However, Altaee and Al-Jafari (2015) investigated the relationship among financial development, trade openness, and economic growth in Bahrain using annual time series data from 1980 to 2012. This study employed the Vector Error Correction Model (VECM), variance decomposition, and impulse response function techniques in examining this relationship. The results show the existence of a long-run relationship among the variables. The empirical findings reveal that financial development and trade openness have a significant influence on economic growth in Bahrain. Conversely, the results are in favor of the demand following and trade-led growth hypotheses.

Employing the Vector Autoregression (VAR) technique and Granger Causality test, Saaed and Hussain (2015) empirically examined causality among financial development, trade openness and economic growth in Kuwait over the period of 1977 to 2012. The empirical results showed that there is no long-run relationship among financial development, trade openness and GDP in Kuwait. However, the result of the Granger causality tests shows that there is causality between financial development and economic growth and between the trade openness and economic growth; hence, supporting the supply leading and trade-led hypotheses. Similarly, using Pedroni cointegration technique and the generalized methods of moment (GMM) estimation technique, Pham (2010) explored the link among financial openness, financial development, and trade openness in twenty-nine developing countries in Asia using time series data from 1994 to 2008. The result shows the existence of bidirectional causality between trade openness and financial development/financial openness. It also shows the heterogeneity of the relationship between financial openness and financial development across different measures.

Employing both linear and non-linear Granger causality tests, Kar et al. (2014) empirically examined the direction of causality among financial development, trade liberalization and economic growth in Turkey. A bi-directional causality was found to exist between economic growth and trade openness; economic growth causes financial development thus giving credence to the demand-following hypothesis, and financial development causes trade liberalization. The result further confirmed strong causal relationships between trade openness, financial development, and economic growth in Turkey. Similarly, Adusei and Nkrumah (2013) examined the relationship between financial development and economic growth in Ghana using annual time-series data from 1971 to 2010. The Fully Modified Ordinary Least Squares (FMOLS) and the Error Correction Method (ECM) results showed

that total domestic credit and broad money supply have an inverse relationship with economic growth both in the short-run and long-run while domestic credit to the private sector has a direct relationship with economic growth in Ghana.

Using panel data sourced from World Bank for the period between 1974 and 2012, Rana and Barua (2015) investigated the relationship between economic growth and financial development in Bangladesh, India, Nepal, Pakistan and Sri Lanka, five emerging economies in South Asia. They found that whereas total debt services and gross domestic saving are drivers of economic growth in these countries, broad money, trade balance and domestic credit are not. The inverse relationship between trade balance and economic growth in these countries is premised on the fact that they are primarily import-dependent thus having current account deficit. Also the insignificance of broad money suggests that funds injected into the economy are not adequately appropriated especially to the real sector due to high rate of money laundering which is occasioned by weak governance, low level financial development and ineffective regulatory system.

Susanto et al. (2011) empirically investigated the impact financial development has on trade of both agricultural and manufactured products across countries. The results revealed that financial development has a positive impact on bilateral trade flows in the manufacturing sector but has a lesser impact on the agricultural sector. It was also found that the impacts vary across regions as the impact of financial development on exports of both the agricultural and manufacturing sector is greater in most developing economies than advanced ones. On the other hand, Khan and Qayyum (2007) empirically examined the impact of trade openness and financial liberalization on economic growth in Pakistan using annual secondary data over the period 1961 to 2005. The ARDL results indicated that both financial policies and trade are significant drivers of economic growth in Pakistan in the long-run. Osabuohien (2007) assessed the effect of trade openness on economic performance of ECOWAS member states using Ghana and Nigeria as case. It was found that trade openness and real government expenditure have significant positive impact positively on the Ghanaian and Nigerian economy even though the effects are higher in the former than the latter.

For Nigeria-specific studies, Madichie et al. (2014) empirically examined the impact of financial development on economic growth in Nigeria over the period of 1986 to 2012. The study made adopted the error correction model and Granger causality test. The empirical results showed that whereas financial development has a negative impact on economic growth in the long run, it positively impacts economic growth in the short run. Also, causality test result validates the existence of demand-leading hypothesis in Nigeria. However, Osuji and Chigbu (2012) examined the impact of the money supply and credit to private sector on the economic growth of Nigeria using secondary data from 1960 to 2008. Their result found support for the feedback hypothesis in Nigeria.

Audu and Okumoko (2013) empirically evaluated the impact financial development has on Nigeria's economic growth using annual time-series data over the period of 1970 to 2012. The empirical result showed that lending rate, credit to private sector, money supply, bank deposit and interest rate are all significant in influencing economic growth in Nigeria implying that financial development is a driver of economic growth in Nigeria. More so, Nwosu and Metu (2015) used annual time series data from 1970 to 2012 to evaluate the impact of financial development on economic growth in Nigeria. The estimated ARDL model results revealed that whereas financial development exerts a significantly positive impact on economic growth in the long-run, trade liberalization variables exert negative impact on economic growth. However, it was found that domestic credit is not significant indicating a dearth of investible funds in the economy and implying that financial development influences economic growth in the long-run but not in the short-run.

Chude and Chude (2015) assessed the relationship between financial development and

economic growth in Nigeria over the period of 1980 to 2013. The result of the estimated vector error correction model (VECM) showed that broad money supply and credit to private sector are not significant to influence economic growth in Nigeria. More so, Atoyebi et al. (2012) empirically assessed the impact international trade has on economic growth in Nigeria using annual time-series data from 1970 to 2010. The empirical results showed that exports, foreign direct investment and exchange rate have significant positive impact on economic growth while inflation, imports and trade openness exert a negative impact on economic growth in Nigeria.

Moreover, Olufemi (2004) evaluated the causal relationship between the trade openness and economic growth in the Nigerian economy using secondary data from 1970 to 2000. The results revealed a unidirectional relationship between trade openness and economic growth implying that more benefits accrue to the country as its openness increases given the level of economic development in Nigeria. Similarly, Ademola et al. (2013) empirically evaluated the impact of trade openness on economic growth in Nigeria using secondary data from 1981 to 2009. The empirical result indicates that non-oil export and trade openness have a direct relationship with gross domestic product while exchange rate and balance of payment have an inverse relationship with gross domestic product. However, Ogwumike and Salisu (2012) found that financial intermediation variables impacts economic growth in Nigeria positively and their result of supports the supply-leading hypothesis. Danlami et al. (2018) showed that financial instability substantially impedes growth while trade openness contributes little to output growth in Nigeria.

The foregoing suggests mixed findings on the finance-trade-growth nexus due to methodological issues, measurement issues, data sources, sample size and the specificity of the contexts. In fact, the strand of the studies that found significant relationship among these variables also differs in the nature of the relationship as well as their transmission mechanism. This suggests the need for a study on the examination of the relationships among financial development, trade openness and economic growth in Nigeria given the extensive formulation and implementation of financial development and trade liberalization policies to stimulate sustainable growth in the Nigerian economy.

Methodology and Empirical Analysis

Data Issues and Model Specification

This study examines the relationship among trade openness, financial development and economic growth in Nigeria spanning the period of 1981 and 2018. Annual time series data are obtained from Central Bank of Nigeria (CBN) Statistical Bulletin, 2018, to examine this relationship. Trade openness is measured as the sum of exports and imports as a ratio of GDP [(Exports + Imports) / GDP]. In the literature, the standard measure of financial development is the ratio of broad money to GDP (M2/GDP). However, Demetriades and Luintel (1996) and Luintel and Khan (1999) argued that rather than measure financial development, this ratio measures the extent of monetization in the economy and increase in monetization devoid of financial development is possible especially in developing countries. Accordingly, De Gregorio and Guidotti (1995) opine that credit to private sector (CPS) as a ratio of GDP (CPS/GDP) is a better indicator of financial development as CPS correctly captures the actual amount of funds that goes to the private sector as against other monetary aggregate measures such as M1, M2 and/or M3. Hence, this study adopts CPS/GDP as a proxy for financial development. Moreover, the growth rate of real gross domestic product in Nigeria is used as a proxy for economic growth. Exchange rate is an important determinant of trade liberalization while interest rate spread (the difference between lending rate and deposit rate) is a good

measure of the performance of the financial system. Hence, exchange rate and interest rate spread are incorporated into the model as control variables to capture the effects of the external and internal workings of the economy respectively.

Data on financial development, trade openness, exchange rate and real GDP are sourced from Central Bank of Nigeria (CBN) Statistical Bulletin (2018) and the data on interest rate spread is sourced from World Development Indicator (2018). All the variables, except financial development and interest rate spread which are in percentage, are expressed in their natural logarithm to aid the interpretation of results in proportionate terms. Routine pre-estimation tests such as stationarity test and cointegration test are needful as they examine the order of integration individual macroeconomic variables to prevent against spurious regression and investigate the existence of a long-run relationship among the variables respectively. In view of this, the basic model employed in the study can be expressed as:

Baseline Model

$$\text{LRGDP}_t = \alpha_1 + \alpha_2 \text{FDEV}_t + \alpha_3 \text{LTROP}_t + \alpha_4 \text{LEXR}_t + \alpha_5 \text{IRS}_t + \mu_{1t} \quad (1)$$

$\alpha_1 > 0; \alpha_2 > 0; \alpha_3 > 0, \alpha_4 > 0; \text{ and } \alpha_5 < 0$

Alternative Model

$$\text{LRGDP}_t = \delta_1 + \delta_2 \text{FDEV}_t + \delta_3 \text{LTROP}_t + \delta_4 (\text{FDEV} * \text{LTROP}_t) + \delta_5 \text{LEXR}_t + \delta_6 \text{IRS}_t + \mu_{2t} \quad (2)$$

$\delta_1 > 0; \delta_2 > 0; \delta_3 > 0; \delta_4 > 0; \delta_5 > 0; \text{ and } \delta_6 < 0$

where:

LRGDP = Log of Gross Domestic Product (measured as Real GDP growth rate)

FDEV = Financial Development (measured as CPS/GDP)

LTROP = Log of Trade Openness (measured as [Exports + Imports]/GDP)

(FDEV*LTROP) = Interactive effect of financial development and trade openness

LEXR = Log of Exchange Rate (₦: \$)

IRS = Interest Rate Spread (%)

α_1 and δ_1 = Intercepts of the baseline and alternative models respectively

$\alpha_2 - \alpha_5$ = Coefficients of explanatory variables of the baseline model

$\delta_2 - \delta_6$ = Coefficients of explanatory variables of the alternative model

μ_{1t} and μ_{2t} = Stochastic Disturbance Terms for the baseline and alternative models respectively

Estimation Technique

This study employs the Stock Watson dynamic OLS technique to evaluate the impact of trade liberalization and financial liberalization on economic growth in Nigeria. DOLS is superior to some other estimators on three grounds. First, the DOLS estimator is more robust in relation to other estimators as it corrects for small sample bias as well as simultaneity bias by incorporating the leads and lags of the differenced independent variables in the equation with co-integrating vectors. Second, DOLS corrects for serial correlation using the Generalized Least Square (GLS) procedure. Third, DOLS accommodates both stationary and non-stationary variables (Stock and Watson, 1993). The rule of DOLS states that the analysis of the short-run model be excluded since it is the adjustment period where the leads and lags net out their effects. (Stock and Watson, 1993).

Empirical Analysis

Table 2 presents the descriptive statistics of the macroeconomic variables used in this study. It shows that the average value of exchange rate, financial development, interest rate spread, real GDP, and trade openness are 88.66/US\$, 11.05 percent, 6.32 percent, 33725 billion and 0.16 respectively. All the variables are positively skewed except for interest rate spread and the skewness of each variable is not significantly different from zero. In addition, the kurtosis of all the variables shows that they are platykurtic (less than 3) and the probability values of the Jarque-Bera statistic of each variable, except financial development, show that the series are normally distributed. Further, all the variables have a relatively high standard deviation.

Table 2. Descriptive Statistics

	EXR	FDEV	IRS	RGDP	TROP
Mean	88.66	11.05	6.32	33725.22	0.16
Median	97.40	8.21	6.96	23068.85	0.10
Maximum	306.08	20.77	11.06	69810.02	0.47
Minimum	0.61	5.92	0.32	13779.26	0.00
Std. Dev.	87.19	5.38	2.81	19578.10	0.16
Skewness	0.80	0.88	-0.59	0.73	0.53
Kurtosis	2.96	1.96	2.58	2.00	1.84
Jarque-Bera	4.05	6.56	2.49	5.01	3.91
Probability	0.1322	0.0377	0.2876	0.0817	0.1413
Observations	38	38	38	38	38

Source: Author's Computation from Eviews9.

Table 3 presents the results of the unit root test using the Augmented Dickey-Fuller (ADF) approach. The results show that whereas the probability values of each of the macroeconomic variables at level were insignificant, their probability value at first difference is significant, thus, suggesting that all the variables employed in this study are stationary only after being differenced. This condition justifies the use of the Johansen approach to cointegration hence; I proceed to examining whether a long-run relationship exists among the variables using the Johansen cointegration method.

Table 3. Augmented Dickey Fuller Unit Root Test Result

	Level	P-Value	First Difference	P-Value	Order of Integration
FDEV	-1.87b	0.6481	-4.88a	0.0003	I(1)
IRS	-2.68b	0.2504	-6.38a	0.0000	I(1)
LEXR	-1.30b	0.8705	-5.52b	0.0003	I(1)
LRGDP	-1.50b	0.8091	-3.40	0.0177	I(1)
LTROP	-1.24a	0.6484	-6.85	0.0000	I(1)

Note: 'a' and 'b' denote model with constant and model with constant and trend respectively while I(1) indicate stationarity at first difference.

Source: Author's Computation from Eviews9.

Before carrying out cointegration test using the Johansen approach and estimating the Dynamic OLS model, it is needful choose the optimal lag length. This is essential because estimation bias results from an under parameterized model while loss of degree of freedom results from over parameterized model. The optimal lag length selection criteria used include:

sequential modified Likelihood Ratio test statistic (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ), and the results are presented in Table 4. In the baseline model, FPE, SC, and HQ selected lag 1 as optimal while LR and AIC chose lag 3. Similarly, in the alternative model, LR, SC, and HQ chose lag 1 as the optimal lag while FPE and AIC selected lag 3. The lag length chosen by most of the criterion will be selected as optimal. Accordingly, the optimal lag length for the baseline and alternative models are lag 1 and 2 respectively.

Table 4. VAR Lag Length Selection Criteria

Baseline Model (Model without Interaction)						
Lag	LogL	LR	FPE	AIC	SC	HQ
1	-65.22729	NA	0.000121*	5.155845	6.266808*	5.539349*
2	-48.56201	23.80755	0.000209	5.632115	7.854040	6.399123
3	-12.28617	41.45809*	0.000136	4.987781*	8.320670	6.138294
Alternative Model (Model with Interaction)						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-310.8496	NA	2.940334	18.10569	18.37232	18.19773
1	-119.4330	306.2666*	0.000422	9.224744	11.09116*	9.869031*
2	-87.43440	40.22682	0.000643	9.453394	12.91960	10.64993
3	-32.92776	49.83464	0.000391*	8.395872*	13.46186	10.14465

Note: * 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; and HQ = Hannan-Quinn Information Criterion

Source: Author's Computation from Eviews9.

Given the unit root test result, this study employs the Johansen cointegration test approach which consists of the trace rank test and maximum-eigenvalue rank test to test the null hypothesis of "There is no cointegration". After incorporating the optimal lag length in the Johansen cointegration test, the result is presented in Table 5. The decision rule is that the null hypothesis is rejected when the trace statistic and maximum eigenvalue statistic are greater than the 5% critical value but not rejected if otherwise. Correspondingly, the results of the trace rank test show that the null hypothesis is rejected because whereas the baseline model has one cointegrating equation, the alternative model has four cointegrating equations. On the other hand, the maximum eigenvalue rank tests show that the baseline model has one cointegrating equation while the alternative model has two cointegrating equations. These results indicate the existence of a long-run relationship between financial development, trade openness, real GDP, exchange rate and interest rate spread as they share a common trend in the long-run

Table 5. Johansen Cointegration Test Result

Trace Cointegration Rank Test Result							
Baseline Model				Alternative Model			
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value
None *	0.673312	77.75382	69.81889	None *	0.774378	150.0106	95.75366
At most 1	0.426903	37.47888	47.85613	At most 1 *	0.675330	97.89927	69.81889
At most 2	0.243503	17.43768	29.79707	At most 2 *	0.526016	58.52613	47.85613
At most 3	0.147448	7.391622	15.49471	At most 3 *	0.411586	32.39580	29.79707
At most 4	0.044768	1.648844	3.841466	At most 4	0.251104	13.83444	15.49471
				At most 5	0.100678	3.714014	3.841466

Maximum Eigenvalue Cointegration Rank Test Result							
Baseline Model				Alternative Model			
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5% Critical Value
None *	0.673312	40.27494	33.87687	None *	0.774378	52.11137	40.07757
At most 1	0.426903	20.04120	27.58434	At most 1 *	0.675330	39.37314	33.87687
At most 2	0.243503	10.04606	21.13162	At most 2	0.526016	26.13033	27.58434
At most 3	0.147448	5.742778	14.26460	At most 3	0.411586	18.56136	21.13162
At most 4	0.044768	1.648844	3.841466	At most 4	0.251104	10.12043	14.26460
				At most 5	0.100678	3.714014	3.841466

Note: * denotes rejection of the hypothesis at the 0.05 level.

Source: Author's Computation from Eviews9.

Given the unit root result that shows all variables are non-stationary and the Johansen Cointegration result that illustrates the existence of a long-run relationship among the variables, this study estimated the Stock Watson Dynamic OLS model as follows:

$$\begin{aligned}
 LR GDP_t = & \alpha_0 + \alpha_1 FDEV_t + \alpha_2 LTROP_t + \alpha_3 LEXR_t + \alpha_4 IRS_t + \sum_{i=-j}^{i=j} \gamma_t \Delta FDEV_{t-i} \\
 & + \sum_{i=-j}^{i=j} \delta_t \Delta LTROP_{t-i} + \sum_{i=-j}^{i=j} \theta_t \Delta LEXR_{t-i} + \sum_{i=-j}^{i=j} \vartheta_t \Delta IRS_{t-i} + \epsilon_{1t} \quad (DOS 1)
 \end{aligned}$$

$$\begin{aligned}
 LR GDP_t = & \beta_0 + \beta_1 FDEV_t + \beta_2 LTROP_t + \beta_3 (FDEV * LTROP)_t + \beta_4 LEXR_t + \beta_5 IRS_t \\
 & + \sum_{i=-j}^{i=j} \gamma_t \Delta FDEV_{t-i} + \sum_{i=-j}^{i=j} \delta_t \Delta LTROP_{t-i} + \sum_{i=-j}^{i=j} \sigma_t \Delta (FDEV * LTROP)_{t-i} \\
 & + \sum_{i=-j}^{i=j} \theta_t \Delta LEXR_{t-i} + \sum_{i=-j}^{i=j} \vartheta_t \Delta IRS_{t-i} + \epsilon_{2t} \quad (DOS 2)
 \end{aligned}$$

The results of the estimated DOLS models are presented in Table 6. The leads and lags of the independent variables are fixed at 1 because of the small sample size. The DOLS 1 and DOLS 2 results show that share of credits to private sector in total GDP (a proxy for financial development) has a significant positive relationship with economic growth in Nigeria such that the Nigerian economy will grow by approximately 0.1 percent if the share of credits to private sector in total GDP should increase by one percent. This suggests that the degree of responsiveness of real GDP to a change in the share of credits to private sector in total GDP is quite low. This result supports the supply leading hypothesis and the findings of Osuji and Chugbo (2012), Aude and Okumoko (2013) and Nwosu and Metu (2015). This implies that financial development is a veritable tool for ensuring the growth of the Nigerian economy thus; efforts should be geared towards the pursuance of financial debt in Nigeria.

Furthermore, whereas the result of DOLS 1 shows a direct relationship between trade openness and economic growth, DOLS 2 result reveals the existence of an inverse relationship between trade openness and economic growth in Nigeria. The direct relationship depicts that the more the Nigerian economy opens up her border for trade with the rest of the world, the more her economy will grow. The converse is true for an inverse relationship between the two variables. However, it is noteworthy that this variable is not significant in both equations indicating that trade openness is not a driver of economic growth in Nigeria. This result is plausible in that Nigeria is an import-dependent nation and the value of her

currency in relation to foreign currencies is very low, thus, her cost of trading with the rest of the world is greater than her benefits. This result contrasts the findings of Olufemi (2004) and Osabuohien (2007).

Having looked at the individual impacts of financial development and trade openness on the growth trajectory of Nigeria, it is expedient to know, apart from the direct impact, the indirect impact of financial development and trade openness in Nigeria hence, the need to interact the financial development and trade openness variables in the DOLS 2 model. This serves as the key contribution of this study. The coefficient of the interaction of financial development and trade openness shows an insignificant direct relationship with real GDP in Nigeria even though the coefficients of financial development and trade openness are positive and negative respectively. This gives evidence that financial development mitigates the negative effect of trade openness on real GDP in Nigeria. It is also noteworthy that the coefficient of the interaction of financial development and trade openness variables (0.03) is less than the individual coefficients of these variable thereby indicating that the interaction have a lower impact on real GDP in Nigeria. It also suggests that there is a need to intensify efforts geared towards markedly developing the financial sector of the Nigerian economy in order to make it globally competitive.

In addition, the results of DOLS 1 and DOLS 2 show that exchange rate has significant positive relationship with real GDP in Nigeria indicating that exchange rate is an important driver of economic growth in Nigeria. Specifically, the Nigerian economy will grow by approximately 0.2 percent if exchange rate depreciates by one percent. This result parallels a priori expectation and supports theoretical postulation which states that exchange rate depreciation cheapens exports and makes import more expensive thereby instigating both price and volume effect which tends to help increase local production to match the increasing foreign and domestic demand thereby increasing aggregate output and engendering economic growth (Aminu and Ogunjimi, 2019; Ogunjimi and Adebayo, 2019; Ogunjimi, 2019; Ogunjimi, 2020; Ogunjimi, 2021; Bolaji et al., 2021). Also, this result parallels the findings of Atoyebi et al. (2012) but negates that of Ademola et al. (2013).

On the other hand, both the DOLS 1 and DOLS 2 results show that interest rate spread has a significant inverse relationship with real GDP in Nigeria such that real GDP will fall by approximately 0.1 percent if the lending rate is more than the deposit rate by one percent. This result supports the economic theory that posits that an increase in lending rate serves as a disincentive to investors thereby reducing investment and aggregate output. Whereas an increase in lending rate will discourage investors, an increase in deposit rate will encourage savers but lead to leakage in the economy. Hence, the magnitude of increase or decrease in the lending rate in relation to the deposit rate would, largely, determine the rate at which the economy will be affected by interest rate spread. Nonetheless, while an increase in interest rate spread will stifle growth, its decline will stimulate growth.

The result of the adjusted R-squared values of DOLS 1 and DOLS 2 show that financial development, trade openness, exchange rate, and interest rate spread as well as the interaction of financial development and trade openness (for DOLS 2 only) explain about 98.4 percent of the variation in real GDP in Nigeria. This shows that the models have good fits. The probability value of the Jarque-Bera statistic shows that the residuals of the estimated models are normally distributed suggesting that the estimated coefficients satisfy the assumptions of the classical linear regression model (CLRM). Hence, these findings are valid and can be used for policy formulation. More so, the unit root test results from ADF and Philip Perron suggest that the residuals of both DOLS 1 and DOLS 2 models are stationary. Hence, the two estimated DOLS equations of this study are not spurious, indicating that the findings of this study are viable for policy prescription.

Table 6. Results of the Dynamic OLS Estimation

Dependent Variable	LRGDP					
	Explanatory Variables					
Equations	FDEV	LTROP	FDEV*LTROP	LEXR	IRS	CONSTANT
DOLS 1	0.057* (11.75)	0.049 (0.79)	-	0.160* (2.91)	-0.051** (-2.87)	9.64* (22.01)
DOLS 2	0.090* (4.40)	-0.216 (-1.24)	0.034 (1.68)	0.205* (3.39)	-0.059* (-3.17)	9.22* (17.85)
	Adj. R ²	S.E.	S.S.R.	Jarque-Bera	Leads	Lags
DOLS 1	0.9836	0.0695	0.0870	0.087 [0.9573]	1	1
DOLS 2	0.9841	0.068	0.066	1.241 [0.5378]	1	1
Unit Root Tests on Residuals of DOLS 1 and DOLS 2						
	ADF (Level)	ADF (First Difference)	Order of Integration	Phillip Perron (Level)	Phillip Perron (First Difference)	Order of Integration
DOLS 1 Residuals	-3.62c*	-	I(0)	-3.10*	-	I(0)
DOLS 2 Residuals	-3.96c*	-	I(0)	-3.98c*	-	I(0)

Notes: * and ** represents significance at 1 percent and 5 percent respectively; t-statistics are in parentheses; p-value of Jarque Bera is in block brackets; and leads and lags are fixed at one because the small number of observations.

Source: Author's Computation from Eviews9.

The granger causality result is presented in Table 7. It reveals that there is a unidirectional causal relationship running from trade openness to real GDP in Nigeria thus, supporting the trade-led growth hypothesis. This result corroborates the finding of Olufemi (2004) who posits that an increase in an economy's openness triggers economic growth. Similarly, there is a unidirectional causal relationship running from real GDP to financial development in Nigeria thereby giving credence to the supply-leading hypothesis. This result is in consonance with the finding of Madichie et al. (2014) but negates Ogwumike and Salisu (2012) who supported the supply-leading hypothesis and Osuji and Chigbu (2012) who supported the feedback hypothesis. Further, the result shows that a unidirectional causality running from exchange rate to real GDP exists in Nigeria indicating that exchange rate

Table 7. Granger Causality Results

Null Hypotheses	Obs	F-Statistics	Prob.	Direction of Causality
LTROP does not Granger Cause LRGDP	37	7.95	0.0080	Unidirectional
LRGDP does not Granger Cause LTROP		0.03	0.8551	LTROP → LRGDP
FDEV does not Granger Cause LRGDP	37	1.53572	0.2237	Unidirectional
LRGDP does not Granger Cause FDEV		6.36798	0.0165	LRGDP → FDEV
LEXR does not Granger Cause LRGDP	37	13.4587	0.0008	Unidirectional
LRGDP does not Granger Cause LEXR		0.00047	0.9829	LEXP → LRGDP
IRS does not Granger Cause LRGDP	37	0.30570	0.5840	No Causality
LRGDP does not Granger Cause IRS		1.38094	0.2481	
FDEV does not Granger Cause LTROP	37	0.14002	0.7106	No Causality
LTROP does not Granger Cause FDEV		2.53096	0.1209	

Source: Author's Computation from Eviews9.

movement influences economic growth in Nigeria and not the other way round. On the other hand, the result reveals that there is no causal relationship between interest rate spread and real GDP as well as financial development and trade openness in Nigeria that further gives credence to the earlier result that the interactive effect of financial development and trade openness has no impact of economic growth in Nigeria.

Conclusion and Policy Recommendations

This study examined the impact of financial liberalization and trade openness as well as their interactive effects on the growth of the Nigerian economy using annual time-series data for the period between 1981 and 2018. This choice of this period is because of the paucity of data on all the variables used in the study before 1981. The proxy for trade openness is the ratio of the sum of exports and imports to total GDP while the proxy for financial development is the share of credit to private sector (CPS) in total GDP because CPS correctly captures the actual amount of funds that goes to the private sector as against other monetary aggregate measures such as M1, M2 and/or M3. The dynamic ordinary least square (DOLS) estimation technique was adopted to estimate the effects of financial development, trade openness as well as their interaction on real GDP in Nigeria while granger causality was employed to examine the direction of causality of the variables.

The key findings of this study is that financial development, trade openness, interaction of financial development and trade openness variables, and exchange rate are positively related to real GDP in Nigeria while interest rate spread is inversely related to real GDP in Nigeria. However, only financial development, exchange rate and interest rate spread have a significant influence on real GDP in Nigeria. Further, it was that the interaction of financial and trade openness variables has a decreasing impact on real GDP unlike when the variables are considered individually. In addition, causality runs from economic growth to financial development as well as from trade openness to economic growth thus, supporting the demand-following and trade-led growth hypotheses respectively. Thus, this study concludes that whereas financial liberalization, exchange rate and interest rate spread are drivers of economic growth in Nigeria, trade openness as well as its interaction with financial development do not exert any significant impact on economic growth in Nigeria. It also concludes that the demand-following and trade-led growth hypotheses hold in Nigeria.

These findings have implications for policy making in Nigeria and other countries having similar economic structure with Nigeria including Iran. First, the coefficient of financial development in both equations are very low (0.1 percent) and it suggests that the financial sector of the Nigerian economy is still operating below its efficient point and its performance is at a low ebb. As a result, it is expedient to design and implement a policy framework geared towards enhancing the intermediation efforts and deposit mobilization of the financial sector that would instigate the integration of the sector with the various productive sectors of the Nigerian economy. Second, the coefficients of trade openness in both equations are not significant. The implication of this on the Nigerian economy is that trade openness does not drive real GDP in Nigeria but this can be corrected by improving trade performance in the country through economic diversification to boost exports, raise the country competitiveness and increase her national output.

Finally, the coefficients of exchange rate and interest rate spread showed that there is a need for Nigeria to develop and implement policies that would ensure stability in exchange rate as well as a stable deposit and lending rate. Maintaining a managed floating exchange rate regime is imperative because it helps cushion the impact of external shock on the economy while a stable deposit and lending rate will help savers and investors make rational expectations, which will lead to great gains for them, and the economy at large.

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