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Re-examining the link between financial structure and economic growth in Nigeria: An empirical investigation

Abstract

This paper re-examined the link between financial structure and economic growth in Nigeria. It sets to identify the prevailing financial structure in Nigeria and the link between the financial structure and economic growth in the face of expansion in the financial organisation size and depths. The paper used annual data from the Central Bank of Nigeria and the World Bank Development Indicators, covering the period of 1981 to 2017. The study adopted a Cobb-Douglas production function form model and applied autoregressive distributed lagged (ARDL) regression. The paper found out that bank-based intermediary is the prevailing financial structure in Nigeria. Also, financial structure contributed positively to outputs in Nigeria within the period investigated. The study recommends that the banking sector should be developed in such a way that it would promote the development of the capital market, and continual development of the banking sector should be maintained.

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1. Introduction

The tentacles of financial economics are many; validation of its relevancy to growth is one of these and how its structure impact growth is equally another aspect of the financial economics that has been x-raying by the researchers in the field. The financial structure is perceived as relevant to growth because of its tendencies in lowering the costs of the transaction, encouraging a higher level of specialization and promotion of technological innovations (Smith, 1776). Stulz (2000) gave credence to the fact that how financial services are arranged matters in achieving economic growth. It is observed that when financial services are structured in such a way that it positively impacts financing and proper management of funds in a corporation, it definitely engenders growth. Contrary to the neoclassical theory and in alignment with Stulz (2000), an ideal financial structure is needed in order to channel savings into an appropriate channel because savings not well utilized will lead to growth denial. Meanwhile, the well-structured financial system will mobilise and allocate savings effectively for investment purpose.

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Premised on the models of “Anglo-Saxon” and “bank-centred”, effective utilization of savings come as a result of ideal financial structure prevailing in an economy, although, the ideal financial structure is a relative term because what is ideal for economy ‘A’ may not be ideal for economy ‘B’. Appropriateness of the financial structure might be relative to the structure of an economy itself. It was noted that bank-centred model favoured the Japanese economy and made a difference when compared to the United States’ economy in the ‘80s, which was not bank-centred (Stulz, 2000; Thurow, 1992). The United States system was fund dominance as at the time (Thurow, 1992). As a matter of fact, it was noted that projects evaluation differs from one country to another based on the organisation of the financial activities in them (Thurow, 1992). Comparing the capital project evaluation, the present and future value is a response of capital costs and organisation of financial activities dictates this costs, “if two firms located in different countries make different decisions on the same project, it has to be, because the cost of capital differs or because the incentives and monitoring of management differs” (Stulz, 2000). Central Bank of Nigeria (CBN) and the Bank of Industry (BOI) keying into the postulation of Schumpeter (1912) in stimulating the national economy by providing support ranging from the provision of finances to technical services to the innovators in the economy. The assistance was given through different borrowers’ anchor schemes as touches, large-scale industries, small and medium scale businesses, and as well as start-ups entrepreneurs.

It is more conventional that some economies are market-based while some others are bank-based, aside the fact that financial structure in the Sub-Saharan countries is growing in size and depths (Iganiga, 2008; Isedu, 2007); more so, there are yet to be consensus in the findings of studies related to financial structure and its impact on economic expansion. Thereby, there is a need to re-examine how the expansion impacts the financial structure. In addition, this study is a follow-up study on a previous work by Gidigbi (2018) based on the methodological approach. This study aimed at identifying the prevailing financial structure in Nigeria and determining the link between the financial structure and economic growth in Nigeria. The rest of this paper covers a review of relevant literature, from which the study established the basis of its method and supports its findings. Then, methodology, followed by results and discussion, and conclusion, all presented section by section.

2. Relevant Literature

Over the years, financial structure literature has given credence to financial setup ability to contribute to the expansion of the real sector, economic expansion and financial inclusion (Beck, 2011). Although, findings of some studies buttressed the theoretical literature position of the positive role of financial setups in economic growth, notwithstanding, there yet to be unison in the findings of the researchers as to this (Kargbo & Adamu, 2009). Scepticism about the contribution of finance in an economy was not new as some believed that its role in economic growth is overemphasized (Lucas, 1988). This position down tool the role-reversal of finance in economic growth (Chandavarkar, 1992). There are a number of competing theories on which the contribution of financial structure to economic growth are discussed (Allen & Oura, 2004; Levine, 2002; Allen & Gale, 1999; Gerschenkron, 1962).

According to Beck (2011), Stulz (2000), and Merton (1995), the financial system contributes to economic expansion through the following means:

- (i) It supports the “efficient exchange of goods and services by providing payment services and thus reducing transaction costs” (Beck, 2016; 2011; Stulz, 2000; Merton, 1995), that is, it fosters entrepreneurship expansion.
- (ii) “It helps overcome investment indivisibilities and allow exploiting scale economies by pooling savings from many individual savers” (Beck, 2016; 2011).
- (iii) It helps in “economizing on screening and monitoring costs and thus allowing more investment projects to be financed

- and, ex-ante, increasing the aggregate success probability” (Beck, 2016; 2011).
- (iv) It helps in monitoring “enterprises and reduces agency problems within firms between management and majority and minority shareholders, again improving resource allocation” (Beck, 2016; 2011).
 - (v) It helps “reduce liquidity risk and thus enable long-term investment” (Beck, 2016; 2011; Merton, 1995).
 - (vi) It allows “cross-sectional diversification across projects, allowing risky innovative activity while guaranteeing an ex-ante contracted interest rate to savers” (Beck, 2016; 2011).

Availability of finance was related to the earlier take-off of the industrial revolution in some countries when compared to others; such countries as the United Kingdom, Netherlands and the United States. All these countries were said to have experienced development in their financial system or financial deepening before they could experience the industrial revolution and political rise they had in the 17th and 20th centuries respectively (Hicks, 1969). It is believed that the availability of long-term investible fund promoted the establishment of industries who took up inventions as input and thereby sustained the industrial revolution.

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It cannot be said that one kind of financial arrangement is better than another but what really matters is the effective and efficient financial structure, which has ability to positively contribute to growth expansion and bring along with it other generative benefits; in respective of the structure model. A well-developed financial system of any structure whatever, which performs its functions very well as observed earlier will stimulate development and growth expansion irrespective of its structure (Levine, 2002; Beck & Levine, 2002)

The financial system is classified into formal and informal. The formal financial system is an organised system of financial market and mostly regulated by the national government towards maximising the usual set objectives of stability and economic expansion in an economy. In Nigeria, the state-regulated agencies of the formal financial system are Central Bank of Nigeria (CBN), Federal Ministry of Finance and National Planning (FMFN), and Securities and Exchange Commission (SEC). As for the informal financial system, is yet to be fully regulated and its regulations have not been easily feasible. The instance of the systems are thrift and saving association of different names, and local money lenders among others. The actual influence of this informal financial system is yet

unknown, however, it serves as a financial haven for the lion share of the populace. Having these sides of financial systems presented us with the fact of the difference between financial development and financial structure (Iganiga, 2008; Isedu, 2007).

Table 2.1 Indicators of financial development and financial structure

Financial development indicators	Financial structure indicators
Turnover of the stock market	Total financial assets percentage of gross domestic product
Stock market trading relative to GDP	Domestic credit provided by the banking sector percentage of gross domestic product
Stock market capitalization relative to GDP	Market capitalization percentage of gross domestic product
The proportion of funds raised externally by firms among others	The total value of shares traded a percentage of gross domestic product
	Insurance premium percentage of gross domestic product
	Market capitalization over bank lending

Source: Author's compilation from Onwumere, Onudugo and Ibe (2013), Demirguc-Kunt and Levine (1999), Guha Deb and Mukherjee (2008), and Arestis, Luintel and Luintel (2005).

As a matter of fact, financial development depends on the financial structure. Development of the financial sector is shaping and dictated by the prevailing structure in the sector. It is noted that policies directly touch the prevailing financial structure in a country but indirectly when it comes to financial development. The indicators of the duo justify this argument. Policies affect stock market directly while the ratio of the stock market (trading or capitalization) to GDP has nothing to do with policies but only the input figures, that is, how financial organisation directly affected by policies and financial development is indirectly affected. Financial structure answers for any policy calls or legislation on the financial sector, in buttressed of this argument, it was concluded that financial structure matters (Mork & Nakamura, 1999; Weinstein & Yafeh, 1998). Contrary to this, it was concluded from cross-sectional (country) studies that financial structure does not matter to economic growth, what really important is the overall financial system that is efficient and effective not the organisation of the financial system (Levine, 1997, 2002, 2003; Beck & Levine, 2002). The financial structures should only play a supportive role to each other or one another, not that one should play a pivotal role over all others. Better still, the aim of the structures should be supportive and balanced, this should be the zenith of the pursuance of financial structure in an economy.

Demirguc-Kunt and Levine (1996) were of the position that an economy with well-developed market-based institutions equally accomplished with a well-developed bank-based institutions and vice-versa. In support of Demirguc-Kunt and Levine (1996) finding, World Bank (2001) was of the opinion that both models serve a complementary role, therefore it was argued that “both the development of banking and market promote economic growth: each can complement the other”. On the other side of the coin, Levine and Zevros (1998) could not overlook their newfound fact as at then that there is a difference in the services provided by the different model of financial structure. It was observed that liquidity provision is the means of growth stimulation under the market-based system (Atje & Jovanovic, 1993). In line with Levine and Zevros (1998), Arestis, Luintel and Luintel (2005) found out in their study that financial structure matters to output levels.

Onwumere *et al.*, (2013), Demirguc-Kunt and Levine (1999), and Guha Deb and Mukherjee (2008), the studies found that bank-based financial indicators contribute positively to economic growth. Onwumere *et al.*, (2013), who worked on Nigeria, identified the financial structure in Nigeria as bank-based, and attributed the positive impact of the same to the banking consolidation carried out in the year 2005. On a contrary note, studies by Ujunwa, Salami and Nwakoby, (2012) and Oima and Ojwang (2013), which was patterned after Levine (2002), and Olofin and Afangideh (2008) found Nigeria to be more of market-based financial structure.

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Most of the related previous studies adopted the ordinary least squares method to analyse their data, which were mostly time-series. Such studies are Onwumere *et al.*, (2013), Ujunwa *et al.*, (2012), and Guha Deb and Mukherjee (2008) among others. While Oima and Ojwang (2013) applied Unrestricted Error Correction Model (UECM) after Autoregressive Distributed Lagged model (ARDL). The fact remains that most of these financial time-series data are not usually stationary and finding them stationary and exhibiting long-run relationship might not be frequently feasible. Apply ordinary least squares may not be the usual order of investigating the relationship. Thereby, this paper is following suit in re-examining the relationship between financial structure and economic growth in Nigeria using the ARDL approach.

3. Method

3.1 Data Sources and Description of variables

The variables used are outputs, proxy by real gross domestic products; gross domestic investment, proxy by capital stock; and financial structure, which is proxy by market capitalisation divided by bank lending. All the

variables were sourced from the Central Bank of Nigeria Statistical Bulletin 2017, while the labour force population was sourced from the World Bank Development Indicators. The labour force population was used to divide both the outputs and the capital stock to have them at per capita level. Data for this paper is available online¹.

The following are the variables in the specified model and each of the variables is extracted thus:

$(Q/L)_t$ = Per capita output at time t.

$(K/L)_t$ = Per capita capital stock at time t.

$(STR)_t$ = Market capitalisation divided by bank lending at time t.

3.2 Estimation Techniques

This tested for both unit root and cointegration tests before proceeding to the estimation of equation 3 using Autoregressive Distributed Lagged (ARDL) techniques in estimating the model coefficients. After which some post-estimation diagnostic tests were carried out.

3.2.1. *Econometrics Diagnostics*

A. Unit Root Tests

Stationarity in the data was tested to affirm the usual expectation of constant mean and variance over time (Gujarati & Porter, 2009). Since it is noted that most of the time-series data may not be stationary. Also, it is important to carry out this test, in order to rule out the possibility of the serial autocorrelation from the study analyses, which may result in spurious statistical outputs. The paper used Augmented Dickey-Fuller unit root test for a test of stationarity because the data of concern is time-series data.

Augmented Dickey-Fuller unit root test specification:

$$\Delta x_t = \rho_t + \rho x_{t-1} + \sum_{i=1}^n \delta_i \Delta x_{t-1} \quad (1)$$

Based on the specified unit-root model, the value for ρ is expected to be between -1 and 1, in order to affirm the stationarity of the variable of concern. If not the variable of interest may be reckoned as non-stationary, then, the possibility of using the autoregressive model was considered.

¹ <https://data.mendeley.com/datasets/f65p2mfphd/1>

B. Cointegration Test

This paper used Johansen and Juselius Cointegration test to test for the existence of long-run relationship among the variables, since, it is ideal that these variables should exhibit an equilibrium relationship with one another. The variables of interest are per capita output as (Q/L), per capita capital stock as (K/L), and financial structure as STR.

$$\Delta \text{Log}(Q/L)_t = \text{Log}(Q/L)_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta \text{Log}(Q/L)_{t-1} + a \text{Log}(K/L)_t + \epsilon_t \quad (2a)$$

$$\Delta \text{Log}(Q/L)_t = \text{Log}(Q/L)_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta \text{Log}(Q/L)_{t-1} + a \text{Log}(STR)_t + \epsilon_t \quad (2b)$$

$$\Delta \text{Log}(K/L)_t = \text{Log}(K/L)_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta \text{Log}(K/L)_{t-1} + a \text{Log}(STR)_t + \epsilon_t \quad (2c)$$

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3.3 Model Specification

A generalized Cobb-Douglas production function model was specified following the work of Arestis, Luintel and Luintel (2005). The per capita of capital stock (K/L) and financial structure (STR) were not stationary at the level. Ultimately, having the explained variable at first integration order further reinforced the adoption of ARDL according to Pesaran *et al.*, (2001).

$$\begin{aligned} \Delta \text{Log}(Q/L)_t &= \alpha_{o(Q/L)} + \sum_{j=1}^n b_{j(Q/L)} \Delta \text{Log}(Q/L)_{t-j} \\ &+ \sum_{j=0}^n c_{j(Q/L)} \Delta \text{Log}(K/L)_{t-j} + \sum_{j=0}^n d_{j(Q/L)} \Delta \text{Log}(STR)_{t-j} \\ &+ \gamma_{1(Q/L)} \Delta \text{Log}(Q/L)_{t-1} + \gamma_{2(Q/L)} \Delta \text{Log}(K/L)_{t-1} \\ &+ \gamma_{3(Q/L)} \Delta \text{Log}(STR)_{t-1} \end{aligned} \quad (3a)$$

$$\begin{aligned} d(\Delta \text{Log}(Q/L))_t &= \alpha_{o(Q/L)} + \sum_{j=1}^n b_{j(Q/L)} d(\Delta \text{Log}(Q/L))_{t-j} \\ &+ \sum_{j=0}^n c_{j(Q/L)} d(\Delta \text{Log}(K/L))_{t-j} + \sum_{j=0}^n d_{j(Q/L)} d(\Delta \text{Log}(STR))_{t-j} \\ &+ \gamma_{1(Q/L)} d(\Delta \text{Log}(Q/L))_{t-1} + \gamma_{2(Q/L)} d(\Delta \text{Log}(K/L))_{t-1} \\ &+ \gamma_{3(Q/L)} d(\Delta \text{Log}(STR))_{t-1} + ECM_{t-1} \end{aligned} \quad (3b)$$

If an economy is more of ‘bank-based’ model a lower financial structure (STR) coefficient is returned from the model but if otherwise a higher financial structure (STR) coefficient is returned from the system specified in equation 3. This paper’s main interest is in the coefficient of a_2 which signal financial structure. A statistically significant coefficient of a_2 means that financial structure (STR) matters, while the insignificant of the coefficient means that financial structure (STR) does not matter (Arestic, Luintel, and Luintel, 2004).

4. Empirical Results & Discussion

4.1 Descriptive Statistics

Data for all the variables in the model were in natural logarithms. Table 1 showed the mean values for each variable in the model, which are actually close to one another. The standard deviation of the three variables shows no wide disparity among the variables. The Jarque-Bera statistical values of 11.47550 for Log(K/L) and 11.95362 for Log(STR) with associated probability values of 0.0032 and 0.0025 respectively implied absence of normality in the distribution of the two variables. All the variables in the specified model were normally distributed based on the Central Limit Theorem (CLT).

Table 1. Descriptive Statistics

	Log(Q/L)	Log(K/L)	Log(STR)
Mean	0.774160	0.056027	1.030307
Median	0.633292	0.006783	0.874882
Maximum	1.204202	0.246567	2.738490
Minimum	0.536255	0.000311	0.433077
Std. Dev.	0.232214	0.089231	0.524163
Skewness	0.794776	1.363887	1.212074
Kurtosis	2.007077	3.053107	4.370112
Jarque-Bera	5.415212	11.47550	11.95362
Prob.	0.066696	0.003222	0.002537
Obs.	37	37	37

Source: Author’s Computations, using Eviews 10.

4.2 Covariance Analysis

Table 2 showed the Covariance analysis output (ordinary). The table showed a positive relationship between the three variables and statistically significant at 1 per cent significance level. High correlation statistics were observed between Log(Q/L) and Log(K/L) but the correlation statistics between Log(Q/L) and Log(STR), and between Log(K/L) and Log(STR) were moderate and statistically significant at a level less than a per cent for all; by implication, the variables were free of multicollinearity concern.

Table 2. Covariance Analysis

Correlation			
t-Stat.			
Prob.	Log(Q/L)	Log(K/L)	Log(STR)
Log(Q/L)	1.000000		

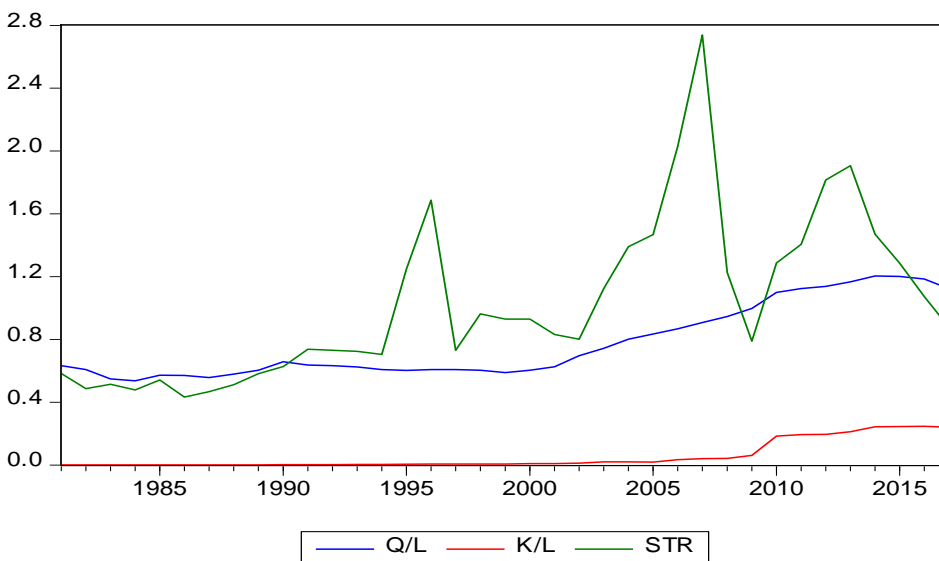
Log(K/L)	0.932355	1.000000	
	15.25643	----	
	0.0000	----	
Log(STR)	0.590788	0.419393	1.000000
	4.331967	2.733146	----
	0.0001	0.0098	----

Source: Author's Computations, using Eviews 10.

Figure 1 showed a graphical description of data used. The trend in the data is expected. Anywhere in the line whenever the line looked-like turning downward implied that labour growth rate is greater than the economic growth rate in each of the outputs and capital. For the output, it happened in 1981, 1990 and 2015. Also, for the capital, a similar situation happened in 2015. Peak points in the STR variable were years in which the financial institutions received a boost that equally transmitted to more capital mobilisation at the Nigeria stock market.

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Figure 1. Graphical Description of the Data



4.3 Stationarity Tests' Outputs

The unit-root tests output reported in table 3 showed that all the variables are not stationary at level but at first difference. Log of per capita outputs is stationary at first difference, at 10 per cent significance level. Log of per

capita capital stock is stationary at first difference, at 1 per cent significance level. The financial structure is stationary at the first difference, at 1 per cent significance level. Stationarity test outputs based on Philip Perron (PP) approach were reported in table 4. It showed a similar result with the ADF outputs reported in table 3. Only that the log(Q/L) could not be found stationary within the level at which other variables were found to be stable. Also, both tests with the inclusion of the trend showed that the Log(Q/L) is not stable at the first difference. The study relies on the outcome of the ADF unit root test to make use of an appropriate model for the analysis, more so, that the ADF is a more appropriate stationarity test for the time-series data. Following the results captured in table 3 and 4, ARDL would be used for estimation of the likely relationship among the variable. Difference level of stationarity in the variables listed is a reinforcement for the use of the specified model.

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Table 3. Outputs of Stationarity Tests Using ADF

Variable	Level	With Trend			Without Trend			
		1 st Difference	Lag Length	Order of Integration	Level	1 st Difference	Lag Length	Order of Integration
Log(Q/L)	-2.0457	-2.3560	9	I(>1)	-0.9027	-2.6758*	9	I(1)
Log(K/L)	-1.0686	-5.2147***	9	I(1)	0.7398	-4.8775***	9	I(1)
Log(STR)	-3.2011	-5.7803***	9	I(1)	-2.4954	-5.8072***	9	I(1)

Source: Author's Computations, using Eviews 10.

Table 4. Outputs of Stationarity Tests Using PP

Variable	Level	With Trend			Without Trend			
		1 st Difference	Lag Length	Order of Integration	Level	1 st Difference	Lag Length	Order of Integration
Log(Q/L)	-2.0792	-2.2590	3	I(>1)	0.1767	-2.6024	3	I(>1)
Log(K/L)	-1.0686	-5.1729***	3	I(1)	0.7398	-4.8775***	3	I(1)
Log(STR)	-2.9945	-8.2598***	15	I(1)	-2.4505	-7.3853***	13	I(1)

Source: Author's Computations, using Eviews 10.

4.4 Estimation and Discussion

4.4.1 Autoregressive Distributed Lagged Estimation

The two stationarity tests carried out indicated different stationarity level for the variables in the specified model. Thereby, autoregressive distributed lagged was applied. The specified equation 3a is estimated. The selected model was based on 2, 1, 0 lagged formation, that is the first variable which is the dependent variable was lagged by two periods and the independent variables were lagged by one and zero (there was no lagged period) periods respectively. Akaike Info Criterion (AIC) was the

basis of the lagged period in the model. Figure 2 showed the detail information of the period lag selection applicable to the model.

The lagged of output per capita at a previous period contributed positively to the output per capita (1.4469), at less than 1 per cent significance level. This is rightly signed and in consonance to the theoretical expectation. Also, on the contrary, the lagged of output per capita at a previous 2 periods contributed negatively to the output per capita (-0.4582), at less than 1 per cent significance level.

The per capita of capital formation contributed positively to per capita output (0.6828) that is, a percentage increase in the per capita of capital formation will lead to 0.68 per cent increment in output per capita, and this is claim is valid at less than 1 per cent significance level. This is rightly signed and in consonance to the theoretical expectation. In addition, the lagged of per capita of capital formation at a previous period exhibited a negative relationship with the per capita output (-0.7824) and this is valid at less than 1 per cent significance level.

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The STR (financial structure) coefficient was not statistically significant. Interestingly, both the coefficient and the significance level were considered to convey different meaning and very relevant to the analysis (Arestis, Luintel and Luintel, 2005). Thereby, more of its relevancy cannot be emphasised here but with the low coefficient, it showed that the system is more of bank-based. Really, the low coefficient signals the prevailing bank-based structure in the country. The economy is more of bank-based or intermediary in the structure; this is in tandem with the work of Arestis, Luintel and Luintel, (2005), which asserted that a low financial structure coefficient implied “bank-based financial structure”. Incessant interventions of the Central Bank of Nigeria go a long way in influencing this finding because the bank has been prompt in ensuring credit flow in the economy through different anchor borrowers’ scheme. In addition, the continual banking reforms in the country have a way of entrenching banking performance in line with Gidigbi (2017), which asserted that the banking reforms tends towards bank performance and economic expansion.

Furthermore, positive link between the STR (financial structure) and per capita outputs is in tandem with extant studies (Mork & Nakamura, 1999; Weinstein & Yafeh, 1998) and contrary to some others (Levine, 1997; 2002; Beck & Levine, 2002), which asserted that financial organisation does not really matter. Furthermore, in agreement with Ujunwa et al., (2012), Nigeria economy is bank-based. However, this position is contrary to the

finding of Oima and Ojwang (2013), which found out that Nigeria economy is “market-based”.

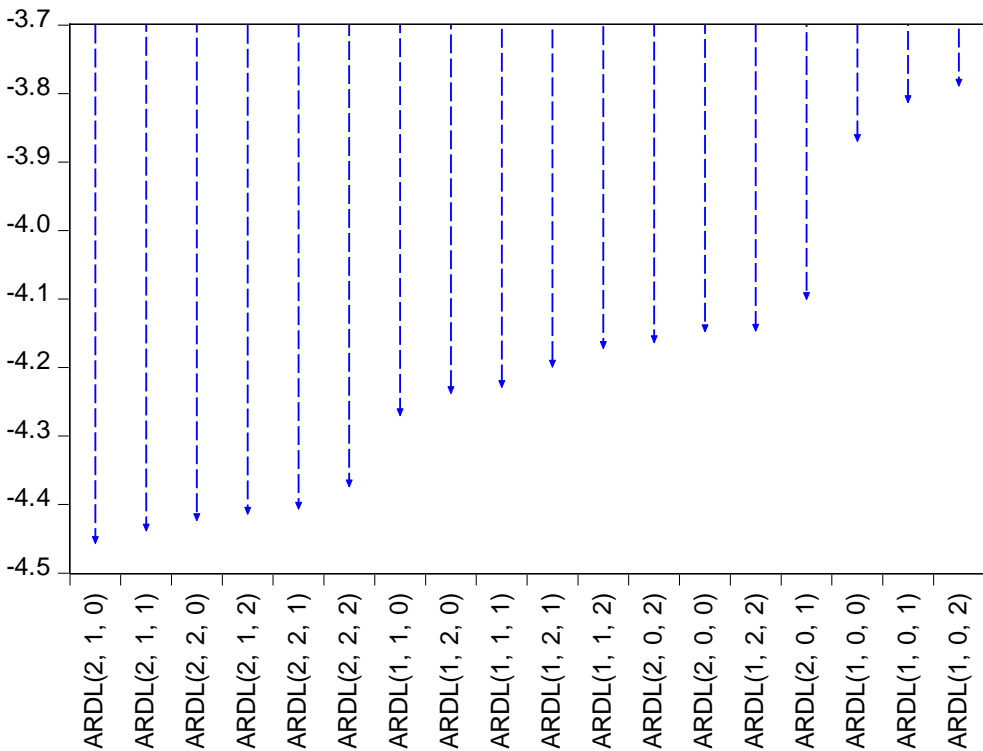
The model’s variables jointly relevant as depicted by the high F-statistic (640.8039), at 1 per cent significance level. The regressors accounted for 99.10 per cent of the total change of the regressand. Also, the Durbin-Watson stat of 1.8975, which is very close to 2 suggested the absence of serial correlation in the model. Notwithstanding, a further test was carried out to justify the DW stat reported.

Table 6 Long-Run Estimate

Dependent variable: Log(Q/L)

Variable	Coefficient	Std. Error	t-Statistics	Prob.
Const.	0.0030	0.04542	0.0661	0.9477
(Log(Q/L))(-1)	1.4469	0.1455	9.9430	0.0000
(Log(Q/L))(-2)	-0.4582	0.1619	-2.8302	0.0084
Log(K/L)	0.6828	0.2348	2.9075	0.0069
(Log(K/L))(-1)	-0.7842	0.2189	-3.5819	0.0012
Log(STR)	0.0130	0.0106	1.2296	0.2287
R-squared	0.9910			
Adjusted R-squared	0.9894			
F-statistics	640.8039			0.0000
Durbin-Watson stat	1.8975			

Figure 2. Model Selection Information
Akaike Information Criteria



4.4.2 Cointegration and ECM Estimation

The induced stationarity of the variables in the main model suggested an error correction model (ECM) as the appropriate follow-up estimation. ECM was estimated and reported in table 7. Although all the coefficients in the model are statistically relevant at 1 per cent significance level, only the variable of interest as applicable to this section was reported in the table.

The variable 'CointEq (-1)' reported in table 7 implies the long-run relationship and error correction models ARDL or ADL. The statistically relevant (at 1 per cent significance level) negative-coefficient (-0.0113) implies that the variables as specified in the model are related at long-run. This buttressed the reliability of the long-run estimation carried out earlier and reported in table 6. Furthermore, the coefficient equally implies the convergence in the model in an instance of deviation. The convergence exhibited in the model was shown to be very slow precisely at 1 per cent per annum. This development is further proof of the heavyweight the banking sector thrown behind the economy in Nigeria.

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The R-squared in table 7 shows that the model is robust, by implication, the explanatory variables approximately explained 56.68 per cent of the change in the explained variable. Meanwhile, DW Stat suggested the absence of serial correlation in the model, as earlier observed, specific test on autocorrelation was carried out to further justify the claim.

Table 7. ECM Estimates

Variable	Coefficient	Std. Error	t-Statistics	Prob.
CointEq(-1)	-0.0113	0.0041	-2.7127	0.0111
R-squared	0.5668			
Adjusted R-squared	0.5397			
Durbin-Watson stat	1.8975			

4.4.3 Post Estimation Diagnostic Tests

A. Serial Correlation Test

Serial Correlation LM test result as reported in table 8 showed that the model's residual is free from serial correlation. Both the test's "F-statistic and Obs*R-squared statistic" values of 0.1841 and 0.4710 respectively, with a probability values (0.8328 and 0.7901) not less than or equal to 5 per cent threshold of significance level validated acceptance of the null hypothesis.

Table 8. Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.1841	Prob. F(2,27)	0.8328
Obs*R-squared	0.4710	Prob. Chi-Square(2)	0.7901

Source: Author's Computations, using Eviews 10.

B. Heteroskedasticity Tests

Tables 9 and 10 showed the results of both White and ARCH heteroskedasticity test. All the test statistics reported in the two tables showed a probability value greater than 5 per cent threshold of significance level respectively. This implies acceptance and validation of the null hypothesis for the model, that, the residual has no presence of heteroskedasticity. Both White and ARCH heteroskedasticity tests rejected the presence of heteroskedasticity in the residuals.

Table 9. White Heteroskedasticity Test

F-statistic	0.4306	Prob. F(20,14)	0.9583
Obs*R-squared	13.3314	Prob. Chi-Square(20)	0.8627
Scaled explained SS	10.7716	Prob. Chi-Square(20)	0.9519

Source: Author's Computations, using Eviews 10.

Table 10. ARCH Heteroskedasticity Test

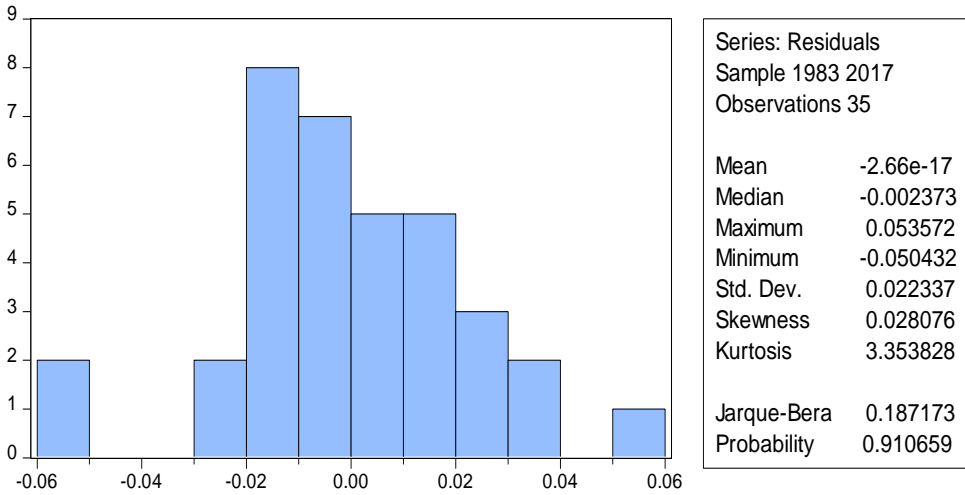
F-statistic	0.0992	Prob. F(1,32)	0.7548
Obs*R-squared	0.1051	Prob. Chi-Square(1)	0.7458

Source: Author's Computations, using Eviews 10.

C. Normality Test

Figure 3 below is a graph with statistics which shows the normality test result. The Jarque-Bera statistic (0.1871) with the probability value of 0.9106 implies that the standardized residuals are normally distributed. Having skewness statistic around zero (0) and the Kurtosis statistic around three (3) reinforced the position, though, the Jarque-Bera statistic equally premised on the operation of these statistics.

Figure 3. Graph Normality Test

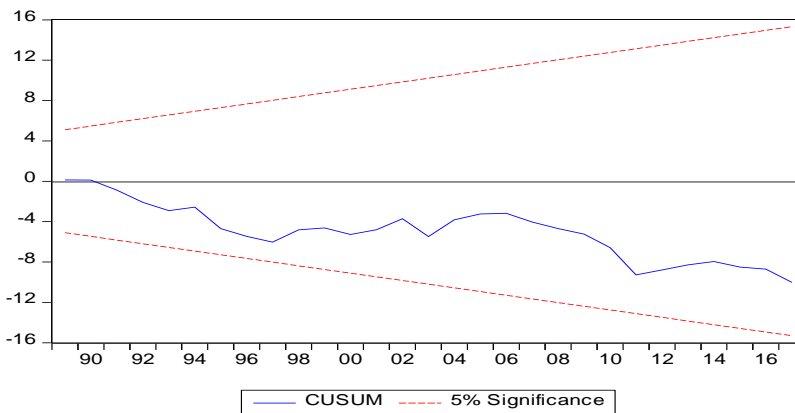


D. Stability Tests

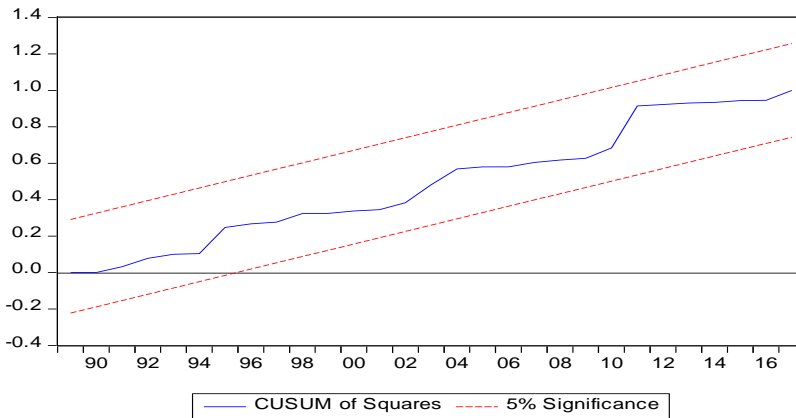
Stability tests were presented graphically in figure 4 and 5, CUSUM and CUSUM of squares tests respectively. The former is a cumulative sum of the recursive residuals while the latter is the cumulative sum of squares of the recursive residuals, both with the five (5) per cent critical lines as a boundary for the plot. The stability test graphs suggested stability in the residual variance or parameter since the plot in both graphs stayed within the 5 per cent critical boundary lines.

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Figure 4. Stability Test I



Also, further check as depicted in figure 6 shows stability in each of the variables of the model at the ± 2 standard error. In a nutshell, the parameters from the model are stable. The C(1) equals $\text{Log}(Q/L)$; C(2) equals $\text{Log}(K/L)$; and C(3) equals $\text{Log}(\text{STR})$.

Figure 5. Stability Test II

5. Conclusion & Policy Recommendations

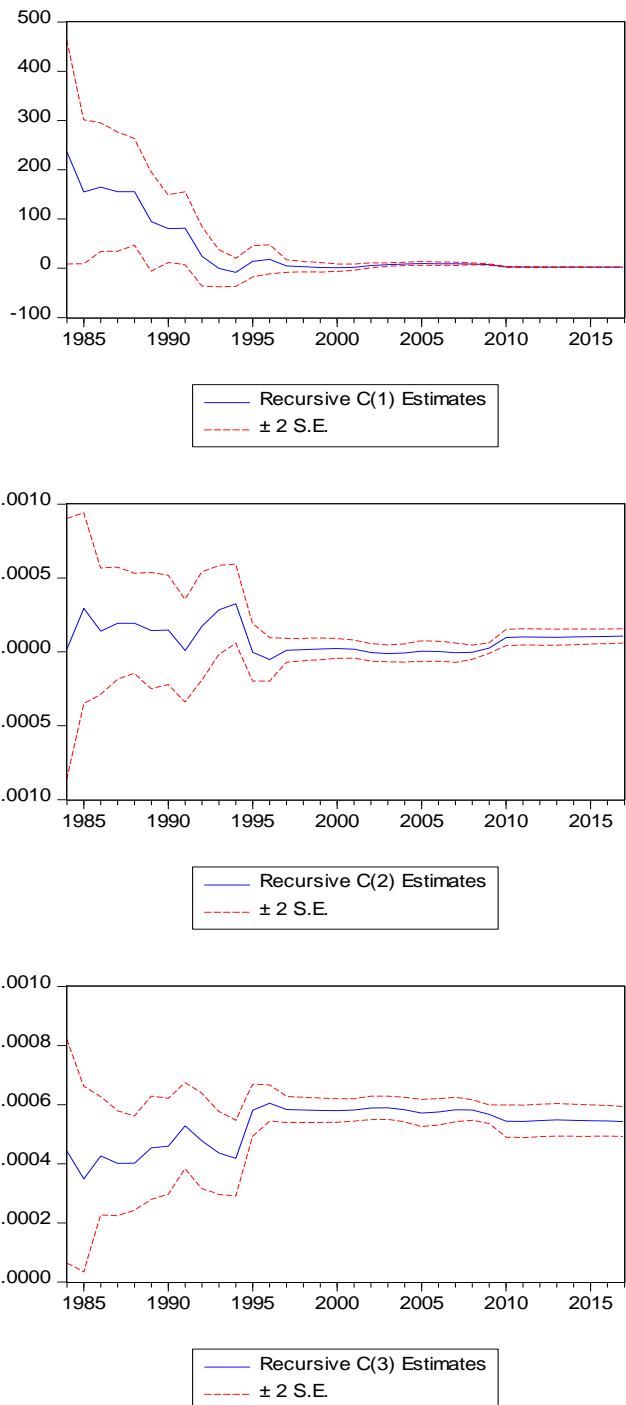
This paper empirically re-examined the link between the financial structure and economic growth in Nigeria, with the aim of identifying the prevailing financial structure in Nigeria even as it expands in size and depth and ascertaining the link between the two. This paper deployed autoregressive distributed lagged (ARDL) regression to analyse the extracted data towards answering the posed questions. The ARDL becomes the choice method for the study due to the different stationarity level of the data used.

As theoretically observed in the extant literature, lagged of per capita output in the first period positively contributed to the per capita output but negative in the second period. Also, per capita of capital formation contributed positively to the per capita output. While it's lagged in the first period exhibited a negative relationship with the per capita output. Bank-based financial intermediary found to be the prevailing financial structure in Nigeria even at the expansion of the financial organisation in size and depths. However, the significance of the bank-based financial structure could not be emphasized in this paper as the probability of the STR (financial structure) coefficient was above the chosen threshold of 5 per cent. A long-run relationship and convergence of deviation existed in the model. Although, it was found that the convergence would be at a slow rate.

Premised on the findings of this paper, the following are the policy recommendations: (i) banking sector should be positioned in a way it will complement and promote the capital market. More so, reforms in the capital market should be promoted and given necessary awareness like the banking sector reforms. The balanced development of the financial structure would safeguard the economy from any fluctuation that may affect the banking sector; (ii) continual development of the banking sector should be maintained *pari passu* with the balancing of the financial

structure towards more effective and expanded the capital market. On a general note, a consistent analysis of these concepts is essential towards advising and formulating an inclusive and balanced developmental policy on financial structure.

Figure 6. Stability of Individual Variable



This paper thereby concludes that “bank-based” model is the prevailing financial structure in Nigeria and that the financial organisation in Nigeria contributed positively to economic growth. Precisely, the golden target of

an economy's financial structure is to strive to the point whereby neither bank-based nor market-based would be matter but both serving complementarily role. This position was equally supported by Levine (1997; 2002), and Beck and Levine (2002). Attainment of this golden target, actually implies that an economy can boast of a consolidated financial structure, which is a bane of unprecedented and inclusive economic growth and development.

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