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Economic Growth in The Wake of Nigerian Financial System Development: A Model of ARDL Bounds Test

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Abstract- *This paper assessed the relationship between financial system development and economic growth in Nigeria. The ARDL results established short and long run relationship between financial system development and economic growth in Nigeria, 1990-2020. Financial development index (FDI) and money supply (MS) had non-significant positive impact on the Nigerian real GDP. The policy implication depicts that development of the financial system remains a veritable instrument for economic growth in emerging economy like Nigeria. Based on results, researchers recommend that the monetary authority should repeal the financial inclusion secretariat with financial system development secretariat to broaden policies on financial inclusion and entrench financial system depth, access and efficiency, policies on cyber security should be pursued vigorously to afloat contemporary issues in global financial system and plausible monetary tools embraced for optimal money supply in the economy.*

Indexed Terms- *Economic Growth, the Financial System and Development.*

I. INTRODUCTION

The critical role of financial system in developing countries propelled it as strategic pathway for economic emancipation. As national economic hub and a veritable tool for the attainment of sustainable economy, the development has been a global phenomenon as it plays catalytic role especially in emerging economies. Ighoroje and Egedi (2015) assert that the Nigerian economy revolves round the hub of an active financial system. The financial system has witnessed colossal dynamism over time brought by financial performance and innovative practices especially in the emerging markets like Nigeria. The financial system development stimulates increase in the number of financial institutions and markets as

well, sophisticates the payment system and alternatives to holding money. This has resulted mainly from technological advancement and increase in competition as the number of institutions increase (Kibaara, 2015). Hayat and Ahmad (2018) opine that the relationship between financial development and economic growth for few decades has been of great interest to researchers to establish; those developing countries committed that economic growth remains possible via development of the financial sector. According to Ebiringa and Durube (2015), a number of studies have documented evidences on the fundamental role of financial system development on economic growth. However, existing studies explored segmented component of the financial system development and focused either on a specific financial institution or financial market and developed economies, limiting the area of coverage and leaving the aggregate financial system unrivaled and lacuna on the emerging economies like Nigeria. Consequently, the paper assesses the relationship between financial system developments on the Nigerian economic growth.

II. LITERATURE REVIEW

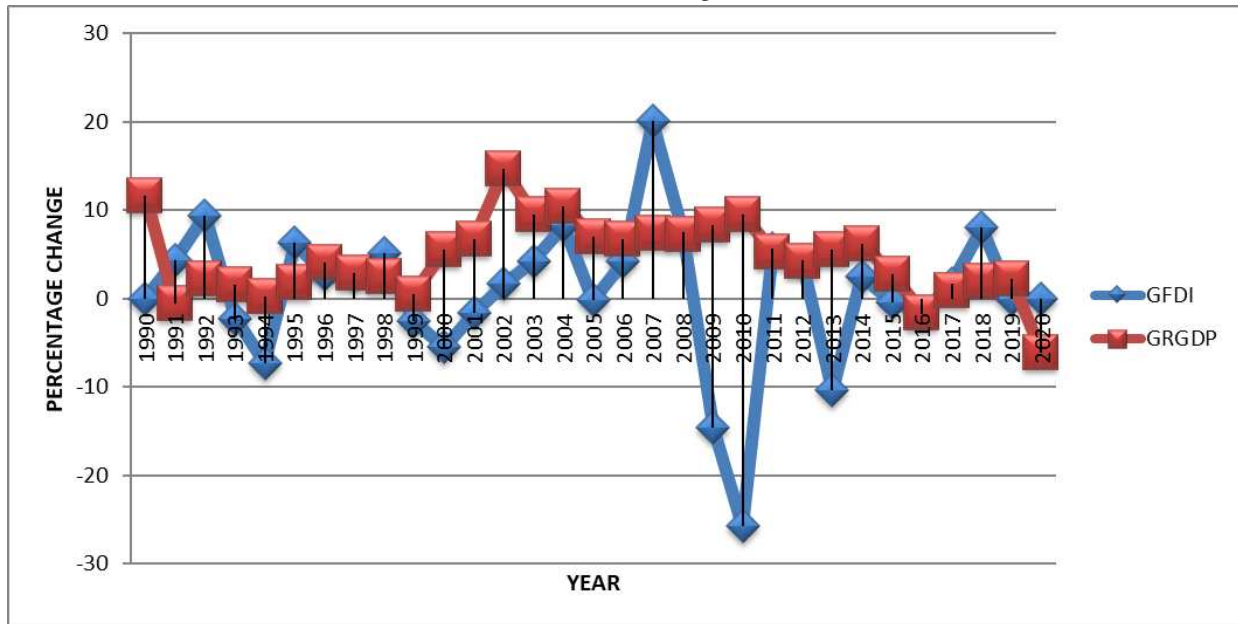
Financial system development measures the aggregate performance of the financial institutions and markets in an economy, and its development manifests in many folds for performance evaluation of the participants and relevant stakeholders. This development is measured by the performance indicators arising from the financial institutions and markets activities compared to benchmark assigned to the country or region based on her economic classification by the global financial regulators and convergence. Bui (2020) defines financial system development as improvements in the financial institutions and markets depth, access and efficiency. Component performance of the financial system basically,

financial institutions and markets depth, access and efficiency measure its development based on how the intermediaries ameliorate the effect of information, enforcement, and transactions costs by providing broad categories of financial services to the economy (Loayza, Ouazad and Rancière, 2018). Development of the size, efficiency and stability of financial institutions and markets along with increased access is regarded as financial system development (Guru and Yadav, 2019). Financial depth indicates the size of financial sector relative to the economy, such as percentage of private sector domestic credit and stock market capitalization. Financial access indicates the level of banking system and stock market accessibility and how widely spread throughout the population, including number of bank branches, ATMs and agents per 100,000 adults. While, financial efficiency measures the ability and resilience of financial intermediaries in providing sustainable low-cost financial services, including stock market turnover ratio and interest rate spread.

Economic importance of the financial system has different intellectual perceptions, but all bored down to economic growth and sustainability. Bakar and Sulong (2018) assert that financial sector development ensures sustainable economic growth and the impact can never be over emphasized. Mwang'onda, Mwaseba and Ngwilizi (2018) posit that financial sector has always been an ingredient for economic growth. Ismail, Ab-Rahim and Pei-Chin (2019) collaborate that economic growth depends on the financial system which is largely built on stable financial development policies. Omofa (2017) avers that development of the financial system influences an economy significantly by lowering transaction cost and thereby encouraging deposits, reduces risk of uncertainty, information asymmetric, provides corporate governance to maximize firm's value, optimum allocation of resources; and encouraging specialization through its exchange function. The trend of financial system development and Nigerian economic growth was presented in graph 1 below.

2.1 Financial system development and economic growth

Graph 1: Authors' graphical presentation of financial system development index (FDI) and the real GDP in Nigeria, 1990-2020



A glance at graph 1 above depicts no linear relationship between financial system development index (FDI) and the real gross domestic product (RGDP). While the RGDP aggregate movements revealed average growth of 4.87%, FDI recorded 0.87% leaving a

glaring gap of 4% spanning from RGDP to FDI. The slopes in FDI and RGDP shows parallel movements, as FDI fluctuates even below the minimal basic point, the RGDP maintained positive trend throughout the period except in 1991, 2016 and 2020 by -0.55%, -1.58% and -6.1% declines respectively. 2016 decline

in RGDP was attributed to the impact lag of 2015 general election and subsequent power transition in Nigeria while that of 2020 was of COVID-19 pandemic. Whereas FDI trend recorded inconsistent movements along the vertical and horizontal axis, RGDP recorded 2.19%, 1.57%, 0.26%, 1.87%, 4.05%, 2.89%, 2.5%, 0.52%, 5.52%, 6.67%, 14.6%, 9.5%, 10.44%, and 7.01% in 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, and 2005 respectively. Others include, 6.73% in 2006, 7.32% in 2007, 7.2% in 2008, 8.35% in 2009, 9.54% in 2010, 5.31% in 2011, 4.21% in 2012, 5.49% in 2013, 6.22% in 2014, 2.79% in 2015, 0.82% in 2017, 1.91% in 2018 and 2.27% in 2019 before dampening by -6.1% in 2020. This economic growth proxy by the RGDP was attributed to various macroeconomic policies of government, but RGDP failed drastically in 2020 due to severe economic recession from the COVID-19 pandemic. The growth rates along the FDI and RGDP lines revealed no correlation with the variables and contradicts Kumar and Paramanik (2020) position that a well-developed financial system enhances capital formation and efficient allocation of resource that triggers economic growth and Chen et al. (2020) contribution that financial system development to economic growth proved considerably worthy together with causalities amid prudence in the understanding of economic growth paradigms.

Theoretically, supply leading theory contends with demand following on causality of financial system development and economic growth paradigm. Supply leading contends that financial sector development is a necessary pre-condition for economic growth (Chandrashekar, Sampath and Chittedi, 2018). While, demand following submit that finance is led rather than leading. According to Omofa (2017), the supply leading concept emphasized that financial sector development induces growth in the real sector. From the supply leading hypothesis, financial sector development leads to transfer of resources from the traditional sector to the modern sector and promotes and stimulates an entrepreneurial response in these modern sectors (Roger et al. 2005 in Omofa, 2017). Supply leading theory posits financial development as a catalyst for economic growth process while demand following theory postulates financial development as an offspring of economic growth. The former postulates a causal relationship from economy to

financial, as the real sector develops, increased demand for financial services induces growth in the latter. The supply leading hypothesis on the other hand, posits a causal relationship from financial to economy as deliberate creation of financial institutions and markets increase supply of financial services; this catalyses growth in the real sector. Chow, Vieito and Wong (2018), the supply leading theory propounded by Hicks (1969) suggests that financial development promotes economic growth and thus has a positive effect on economic growth. Supply leading has two functions: to transfer resources from the traditional, low growth sectors to the modern high growth sectors and to promote and stimulate an entrepreneurial response in these modern sectors (Patrick, 1966 in Vieito and Wong, 2018). Levine (1996) argued that the preponderance of theoretical reasoning and empirical evidence suggests a positive, first order relationship between financial development and economic growth.

Empirically, the relationship between financial system development and economic performance has been explored in this area of intellectual contest with enormous measures harnessed in the related literature across the globe. The threshold regression model of Tariq, Khan and Rahman (2020) on the nonlinear relationship between financial development and economic growth in Pakistan reveals that economic growth responds positively to financial development when the level of financial development surpasses the threshold level and negative impact on economic growth when financial development lies below the level. This finding also revealed that economic growth reacts differently to financial development, and the relationship between financial development and economic growth was U-shaped in Pakistan. Rahman, Khan and Charfeddine (2020) investigated the impact of financial development on economic growth in Pakistan using the Markov Switching Model. Results based on two state Markov switching model confirms the Schumpeter's view that finance spurs growth, and reveals that financial development augments economic growth. Imoagwu and Ezeanyej (2019) assessed the relationship between financial development and economic growth. Ratio of broad money supply to GDP, interest rate, stock market recapitalization and credit to private sector to GDP on economic growth served as proxies. Results revealed

that financial development had significant positive relationship with economic growth in the short run, negative in the long run and that causality runs from financial development to economic growth. Bogari (2019) evaluated the relationship between financial development, financial institution quality and economic growth using dynamic panel approach and generalized method of moments (GMM). Liquid liabilities private credit of banks and other financial institutions validated that economic growth was affected by financial development in Saudi Arabia, and posited positive significant relationship between financial institution quality and economic growth. Yadav (2019) System GMM results confirmed that financial development positively and significantly determines economic growth in the emerging economies of Brazil, Russia, India, China and South (BRICS). Škare, Sinković and Porada-Rochoń (2019) investigated finance-economic growth nexus and revealed the existence of finance-economic growth link in Poland. Ismail, Ab-Rahim and Pei-Chin (2019) confirm a long run relationship between financial development and economic growth in Malaysia and running causality from economic growth to financial development. Haque (2020) assessed the role of financial development towards the growth of the private sector. Results showed that the private sector gross domestic product had a negative relationship with the supply of money, positive relation with bank credit to private sector, and no significant relationship with share market capitalization. Private sector growth had a positive and significant relationship with government expenditure, investment and trade openness. Iwegbu (2020) Autoregressive distribution lag (ARDL) model shows that pension fund contribution was effective in stimulating economic growth through investment in portfolios that yield short term returns in Nigeria. Chen et al. (2020) Nonlinear ARDL results revealed short run positive shocks in financial development and long run negative shocks in Kenya. Kumar and Paramanik (2020) NARDL revealed that financial development had positive impact on economic growth except in the short run.

III. METHODOLOGY AND DATA ANALYSIS

ARDL bounds test was employs a single reduced form equation for determining both short and long run

relationship among the model variables. According to Lawal et al. (2016) and Ogwumike and Salisu (2017), ARDL bounds test technique has several advantages over other estimation techniques as it could be applied regardless of the order of the integration of the regressors either I (1) and/or I (0)); it is a more statistically significant approach for examining correlation when faced with small data size as other techniques require large data size for validity to hold. It also allows for the variables to have different optimal lags, which is not applicable to other techniques. Hence, this model was adopted and specified thus:

$$\begin{aligned} &\Delta \ln RGDP_t \\ &= \beta_0 \\ &+ \sum_{t=0}^{n1} \beta_1 \Delta \ln RGDP_{t-1} \\ &+ \sum_{t=0}^{n2} \beta_2 \Delta \ln FDI_{t-1} + \sum_{t=0}^{n3} \beta_3 \Delta \ln MS_{t-1} \\ &+ \phi_1 \ln RGDP_{t-1} + \phi_2 \ln FDI_{t-1} + \phi_3 \ln MS_{t-1} \\ &- 1 \\ &+ \epsilon_t \dots \dots \dots (1) \end{aligned}$$

Where: RGDP = the real gross domestic product. FDI and MS represent financial development index and money supply respectively. *ln* = the log of the variables. Δ = the first difference operator. β_0 = constant term and β_1 , β_2 and β_3 = the short-run coefficients. ϕ_1 , ϕ_2 and ϕ_3 = the long-run coefficients; n_1 , n_2 and n_3 = the lag length and ϵ_t represent the error term.

Table 1: Selection of Lag length

Lag	FPE	AIC	SIC	HQIC
0	1149.467	17.06355	17.25386	17.12173
1	1149.467	17.06355	17.25386	17.12173
2	1062.373 **	16.93997 **	17.17994 **	17.01133 **

**indicates lag order selected by the criterion.

Optimal lag length of two (2) out of a maximum of 2 lag structure as selected by four different criteria was observed in table 1 above, Final Prediction Error (FPE), Akaike information criteria (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HOIC) recorded the least values at two lag lengths.

Table 2: ARDL Result

Dependent Variable: RGDP
 Method: ARDL
 Date: 06/02/21 Time: 20:07
 Sample (adjusted): 1992 2020
 Included observations: 27 after adjustments
 Maximum dependent lags: 2 (Automatic selection)
 Model selection method: Akaike info criterion (AIC)
 Dynamic regressors (2 lags, custom fixed):
 Fixed regressors: FDI MS C
 Number of models evaluated: 2
 Selected Model: ARDL (2)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
RGDP (-1)	1.756365	0.246405	7.127971	0.0000
RGDP (-2)	-0.809801	0.340963	-2.375042	0.0267
FDI	11503.70	9950.932	1.156043	0.2601
MS	0.064196	0.188040	0.341394	0.7360
C	-461.6338	2242.564	-0.205851	0.8388

$RGDP = 1.75636469149RGDP (-1) - 0.809800550316RGDP (-2) + 11503.7035733FDI + 0.0641955528132MS - 461.633827961CM$, P-Value = 0.2601 and 0.7360 > 0.05 critical value, FDI and MS had positive and non-significant impact on RGDP in the short run. This was explained by the positive coefficients value of the explanatory variables (FDI and MS) and the t-statistic less than two in absolute term and corresponding probability value of the t-statistic greater than five percent critical value. The R² as the summary measure that shows how well the sample regression line fits the data equals 0.997315, indicating that 99% variation in RGDP was explained by a change in FDI and MS, and the remaining 0.0001% was explained by variable not included in the model. The adjusted R² takes account of a greater number of regressors if included and it explains 99.6827% variation in the dependent variable.

Table 3: ARDL Bounds Test for Cointegration

Variables	F- Statistics	Cointegration
F (RGDP/FDI, MS)	8.464408**	Cointegration
Critical value	Lower Bound	Upper Bound
1%	6.44	6.44
5%	4.6	4.6
10%	3.8	3.8

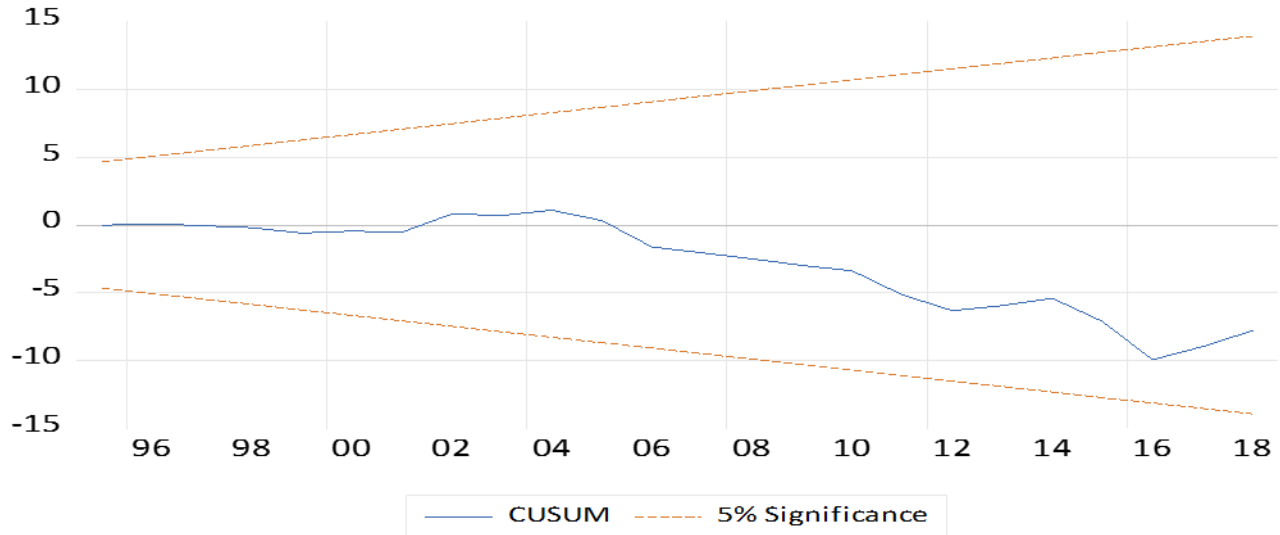
Notes: *** Statistical significance at 10% level; ** Statistical significance at 5% level; * Statistical significance at 1% level. The lag length k = 2 was selected based on the AIC and SIC.

Table 3 above reveals long run relationship between real GDP and financial system development. This was explained by F-statistic value of 8.464408 greater than integrated order bands (upper bound values) and the t-statistic.

R-squared	0.997315	Mean dependent var	40970.58
Adjusted R-squared	0.996827	S.D. dependent var	18860.34
S.E. of regression	1062.373	Akaike info criterion	16.93997
Sum squared resid	24830013	Schwarz criterion	17.17994
Log likelihood	-223.6897	Hannan-Quinn criter	17.01133
F-statistic	2043.104	Durbin-Watson stat	2.015195
Prob(F-statistic)	0.000000		

*Note: p-values and any subsequent tests do not account for model selection.

Graph 2: CUSUM Stability Test



The CUSUM in the graph 2 above was used to test stability of the function as CUSUM plot stays within the critical 5% bounds, that confirms the long run relationship among the variables and stability of the coefficient.

CONCLUSION/IMPLCATIONS OF RESULT AND RECOMMENDATIONS

The ARDL results established short run and long run relationship between financial system development and economic growth in Nigeria, reveals that financial development index (FDI) and money supply (MS) had non-significant positive impact on the real GDP in Nigeria within the period under review. This implies that units change in the FDI causes a higher proportionate change (11503.70) in the real GDP and a unit change in the MS causes 0.064196 change in the real GDP in the short and long run. Policy implication confirms that financial system development remains a veritable instrument for economic growth in emerging economy like Nigeria. Researchers recommend based on the results: that the monetary authority should repeal the financial inclusion secretariat with financial system development secretariat to broaden policies on financial inclusion and entrench financial system depth, access and efficiency, policies on cyber security should be pursued vigorously to afloat contemporary issues in global financial system and plausible monetary tools embraced for optimal money supply in the economy.

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