

# Banking Sector Intermediation Development and Growth of a Developing Economy: An Empirical Investigation of Nigeria

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## Research

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## Abstract

In developing economies, banks act as a conduit for the efficient mobilization of financial resources from the surplus sectors for effective allocation to the deficit sectors for productive investment that will in turn lead to economic growth. Thus, the study is aimed at evaluating whether development in the banking sector intermediation process in the form of increase in the number of branches, credit to private sectors, intermediation efficiency and total assets stimulates economic growth in Nigeria during the period of 1987 to 2018. The study employed the Johansen cointegration test, dynamic ordinary least square (DOLS) regression and error correction model in determining the relationship between the variables. The results of the cointegration test confirmed the existence of long-run relationship between banking sector development indicators and economic growth in Nigeria. Whereas, in the short run, only number of bank branches and bank's total asset have a positive and significant impact on economic growth signifying that much of Nigeria's superior growth performance is attributed to increase in the number of bank branches and growth in bank's assets. Credit to private sector has negative and insignificant relationship with economic growth while bank's intermediation efficiency has positive and insignificant relationship with economic growth.

## Introduction

A well developed banking sector must have a good number of highly capitalized banks that will impact positively on the economic growth of a nation. Aside from this, such highly capitalized banks must have an even spread in the number of branches in both rural and urban areas to be able to mobilize funds from the surplus sectors of the economy for efficient allocation to the deficit sectors of the economy for productive investment that will in turn lead to economic growth.

Schumpeter (1911) argued that efficient financial system plays an important role in helping a nation's economy to grow, and well-functioning banks spur technological innovation by offering funding to entrepreneurs who successfully implement innovative products and production processes, and identify and fund productive investments, and all this stimulate future growth. According to Bencivenga and Smith (1991), the basic activities of banks are acceptance of deposits and lend to a large number of agents, holding of liquid reserves against predicated withdrawal demand, issuing of liabilities that are more liquid than their primary assets and eliminating or reducing the need for self financing of investments.

Mohammed (2017) pointed out that banking system is important to the economic growth through its ability in gathering and attracting deposits from savers. Secondly, its role in providing loans to encourage investment and production. Thirdly, its ability in creating economic expansion to the most of economic sectors such as; Agriculture, industry and trade sector. Fourthly, its intermediary role between savers and borrowers. Finally, banking industry contributes to the formation of initial capital for investment projects.

Kenourgios, and Samitas (2007), state that financial services offered by the banking sector are critical to the economic growth and development of a country where investment, insurance, bank debt and equity as well as savings enables the populace to save money, hence, safeguard themselves against unplanned financial circumstances, enable establishment of businesses, increase effectiveness and compete both at home and worldwide markets, while for the poor population, the financial services lessen vulnerability hence help them administer resources available to generate income through use of strategies to expand the growth of the economy.

The financial intermediation process which channels funds from the surplus units to deficit units of an economy largely depends, inter-alia, on the level of a country's financial or banking system development (Ayunku and Etale, 2014). Scott (2010) observed that the banking sector of most African countries do not have sufficient depth to play a catalytic role in promoting the development of a deep financial sector. He stress that most standard indicators of banking sector depth are low when compared to the rest of the world and that credit to the private sector is limited, assets are highly concentrated in a small number of banks and that the total volume of assets are also very low.

The link between the banking sector intermediation and the growth of the Nigerian economy has been weak. The real sector of the economy, most especially the high priority sectors which are also said to be economic growth drivers are not effectively and efficiently serviced by the banking sector. Also, most investors that are opportune to obtain credit from banks tend to divert it to unproductive venture rather than utilizing it for the purpose for which they are meant for. Sani and Alawiyya (2015) observe that the banks are declaring billions of naira profit but yet the real sector continues to be weak thereby reducing the productivity level of the economy and hence affecting the Gross domestic product. They added that most of the operators in the productive sector are folding up due to the inability to get loan from the financial institutions or the cost of borrowing was too outrageous. The Nigerian banks have concentrated on short term lending as against the long term investment which should have formed the bedrock of a virile economic transformation.

Also, most banks in Nigeria have concentrated in opening up branches in the urban areas at the expense of the rural areas. Hence, huge amount of cash are lying idle in the rural areas and thus, being left out of the banking stream (Azolibe, 2019). These idle funds are supposed to have been mobilized by banks and channeled to the deficit sector of the economy for productive investment that will in turn drive economic growth.

Empirically, the relationship between banking and financial sector intermediation development has been widely investigated in most developing and developed countries of the world. Limited evidence however exist in Nigeria and also, the few empirical studies conducted in Nigeria and other developing countries such as Ayunku and Etale (2014), Nwaeze, Michael and Nwabekee (2014), Iwedi, Okey-Nwala, Kenn-Ndubuisi and Adamgbo (2016), Murari (2017), Petkouski and Kjosevski (2014), Awdeh (2012) have concentrated mainly on using bank deposit, credit to private sector, interest rate and money supply as a measure of banking sector intermediation development. However, this study will improve on the variables employed by previous studies by using growth in the number of bank branches, intermediation efficiency and bank's total assets as a measure of banking sector intermediation development. Thus, this study is aimed at determining how banking sector intermediation development measured by the growth in the number of bank branches, growth in credit to private sector, growth in intermediation efficiency and growth in bank's total asset contributes to economic growth in Nigeria.

The rest of the article is structured as follows. The second section covers the Banking sector intermediation development indicators. The third section covers the theoretical and empirical framework. The fourth section covers analytical model, estimation strategy and analysis and discussion of results and finally, the Conclusion and recommendations are drawn in the fifth section.

### **Banking Sector Intermediation Development Indicators**

The banking sector intermediation development is measured by growth in the number of bank branches, growth in credit to private sector, growth in intermediation efficiency and growth in total asset in this study. They are discussed as follows;

#### **Growth in the Number of Bank Branches**

The banking sector in Nigeria has witnessed growth in terms of spread in the number of branches. According to CBN (2018), the number of bank branches, increased to 5,714 in 2017 from 5,570 in 2016. Before the introduction of the rural banking scheme in 1977, most banks in Nigeria concentrated mainly in opening up branches in the urban areas. However, Government through the rural banking scheme had made it compulsory for banks to open up branches in the rural areas. Although, most Deposit Money Banks complied with these government directives, they did so reluctantly and are still doing so in recent time. Generally, rural branches were considered unprofitable by Deposit Money Banks for reasons ranging from heavy capital outlay, due to lack of infrastructure in these rural areas, to inadequate manpower to meet the needs of these rural branches because of mass expansion.

Branch network expansion remains one of the traditional and most effective methods used by Nigerian banks in mobilizing funds from the public for onward lending to the deficit economic units as most households and businesses still find it safer and more convenient to deposit their hard earned money in a bank. In most developed countries of the world such as USA, Canada, Australia, Germany, United Kingdom e.t.c, banks use electronic channels such as the Automated teller machine (ATM) to mobilize more cash deposit from the public. Their ATM can perform both deposit and withdrawal operations. Hence, bank customers can make cash deposit anytime of the day without necessarily visiting a bank branch. But in developing countries like Nigeria, the ATM is currently deemed as simply a cash dispensing machine as only withdrawals can be made. Hence, bank branches remain the only channel where cash deposit transactions can be made by the public. Banks open up branches in commercial areas that are highly populated in order to move banking closer to people and also mobilize more deposit that will be allocated to the productive sectors of the economy in the form of credit that. This practice helps to increase investment and economic growth of the country. Below is a table showing number of Deposit Money Banks branches in Nigeria by state and abroad from 2006 to 2018.

**Table 1: Number of Deposit Money Banks Branches by State and Abroad From 2006 to 2018**

Year		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Branches Abroad<sup>2</sup></b>		2	7	8	2	2	2	2	1	1	2	2	2	2
<b>Number of Deposit Money Banks Branches in Nigeria by State<sup>1</sup></b>	<b>Abia</b>	104	111	138	141	146	125	138	147	144	135	142	137	135
	<b>Abuja(FCT)</b>	163	219	283	361	398	359	379	397	380	369	421	437	382
	<b>Adamawa</b>	39	52	58	63	67	79	63	61	47	47	57	64	66
	<b>Akwa-Ibom</b>	60	78	85	99	99	92	100	94	92	103	106	114	88
	<b>Anambra</b>	121	174	212	217	237	222	228	224	219	218	219	214	209
	<b>Bauchi</b>	35	45	50	51	53	50	46	46	47	48	50	47	55
	<b>Bayelsa</b>	28	31	37	38	37	37	37	38	38	38	38	39	35
	<b>Benue</b>	39	53	61	71	75	57	73	76	67	63	69	71	78
	<b>Borno</b>	61	57	68	71	79	68	71	69	83	72	60	61	58
	<b>Cross-River</b>	36	52	63	71	79	76	76	80	79	74	78	79	72
	<b>Delta</b>	98	129	174	193	198	177	194	198	178	180	200	205	183
	<b>Ebonyi</b>	15	22	28	32	35	45	33	33	59	61	37	36	59
	<b>Edo</b>	109	118	163	175	183	162	188	192	144	165	178	188	159
	<b>Ekiti</b>	31	54	67	58	80	60	64	76	91	87	86	92	76
	<b>Enugu</b>	90	93	120	130	141	116	142	147	158	151	159	162	127
	<b>Gombe</b>	25	29	33	40	40	36	36	37	43	41	36	37	65
	<b>Imo</b>	37	57	84	104	104	97	100	102	110	105	98	100	99
	<b>Jigawa</b>	19	29	34	35	39	37	36	38	63	66	38	36	43
	<b>Kaduna</b>	126	133	157	164	183	170	169	171	154	164	168	173	169
	<b>Kano</b>	130	130	160	183	193	186	183	183	174	170	178	179	195
	<b>Katsina</b>	33	41	50	57	62	55	58	59	73	78	56	55	52
	<b>Kebbi</b>	21	31	35	36	40	40	37	38	95	37	37	35	49
	<b>Kogi</b>	27	64	68	81	80	77	82	84	88	80	79	82	70
	<b>Kwara</b>	39	70	67	72	79	139	75	79	104	101	78	84	100
	<b>Lagos</b>	1038	1407	1551	1690	1766	1453	1692	1678	1443	1486	1645	1686	1478
	<b>Nasarawa</b>	19	27	40	48	58	51	49	48	68	69	49	49	67
	<b>Niger</b>	46	51	69	75	80	76	79	82	67	65	78	86	64
<b>Ogun</b>	52	122	139	149	175	402	161	154	137	142	154	172	153	
<b>Ondo</b>	87	91	107	109	121	109	110	119	106	101	113	120	120	
<b>Osun</b>	38	81	93	92	105	118	101	104	101	99	106	108	86	
<b>Oyo</b>	112	163	191	220	236	203	223	237	347	343	222	237	195	
<b>Plateau</b>	77	65	73	76	79	72	77	75	75	71	70	67	75	
<b>Rivers</b>	179	197	248	273	302	246	310	311	292	275	312	319	275	
<b>Sokoto</b>	46	41	54	59	53	53	52	52	43	45	53	52	60	
<b>Taraba</b>	16	27	30	35	37	41	35	35	40	40	34	27	39	
<b>Yobe</b>	22	32	33	32	35	35	33	35	38	41	34	31	27	

<b>Zamfara</b>	15	24	29	35	35	33	34	40	39	38	30	31	38
<b>TOTAL</b>	<b>3233</b>	<b>4200</b>	<b>4952</b>	<b>5436</b>	<b>5809</b>	<b>5454</b>	<b>5564</b>	<b>5639</b>	<b>5526</b>	<b>5470</b>	<b>5570</b>	<b>5714</b>	<b>5301</b>

**Source:** Authors Compilations from Central Bank of Nigeria (CBN) Statistical Bulletin, 2018

From the above table, it can be observed that Lagos state has the highest number of bank branches from 1038 in 2006 to 1478 in 2018 and then followed by Abuja (FCT), Rivers state and Anambra state from 163 in 2006 to 382 in 2018, from 179 in 2006 to 275 and from 121 in 2006 to 209 in 2018 respectively. This is so because they are the highest in terms of commercial activities. Hence, banks tend to take advantage of these states in order to mobilize huge deposit from the public. The least in terms of number of bank branches is Yobe state which was 27 as at 2018. This is so because the state is still less developed and there are no much commercial activities there compared to other state. Thus, banks will find it very unprofitable opening up branches there. Also, As at 2017, the total number of deposit money banks branches increased from 3233 in 2006 to 5714 in 2017 representing an increase in 76.7% (CBN, 2017). There was a slight drop from 5714 in 2017 to 5301 in 2018 due to the mergers and acquisitions in the banking sector that made the merging banks to sell off most of their branches.

**Note:** The data started from 2006 as Central Bank of Nigeria (CBN) started classifying the number of Deposit Money Banks branches by state after the bank consolidation in 2005. Before then, branches were classified into urban and rural branches.

### **Growth in Credit to Private Sectors**

Olowofeso, Adeleke and Udoji (2015) defined credit to private sectors as financial resources provided to the private sector, such as loans and advances, purchases of non-equity securities, trade credits and other accounts receivable, which establish a claim for repayment. Bencivenga and Smith (1991) posited that consumption goods in the economy are produced from capital and labour. An entrepreneur who obtains credit from the bank purposely for the commencement of a business, uses it to hire labour so as to produce goods and services which in turn leads to economic growth.

In Nigeria, the banking system credit to private sectors has increased tremendously right from the period of the post structural adjustment programme (SAP) which led to an increase in the number of banks. Credit to private sector increased from N21.08 billion in 1987 to N22,521.93 billion in 2018. However, the capacity of the banking system to finance the economy declined as the ratio of credit to private sector to GDP fell from 8.53 per cent in 1988, to 6.71 per cent in 1990 and from 10.10 per cent in 1993, to 6.22 per cent in 1995 and then in recent time, the ratio of credit to private sector to GDP fell from 20.77 per cent in 2016, to 17.63 per cent in 2018 (CBN, 2018) as shown in table 3 below.

**Table 2: Credit to Private sector and Ratio of Credit to Private sector to GDP (1987-2018)**

Year	Credit to Private Sectors (₦billions)	GDP at Current Basic Prices (₦billions)	Ratio of Credit to Private sector to GDP (%)	Year	Credit to Private Sectors (₦billions)	GDP at Current Basic Prices (₦billions)	Ratio of Credit to Private sector to GDP (%)
1987	21.08	249.44	8.45	2003	1,096.54	13,301.56	8.24
1988	27.33	320.33	8.53	2004	1,421.66	17,321.30	8.21
1989	30.40	419.20	7.25	2005	1,838.39	22,269.98	8.26
1990	33.55	499.68	6.71	2006	2,290.62	28,662.47	7.99
1991	41.35	596.04	6.94	2007	3,668.66	32,995.38	11.12
1992	58.12	909.80	6.39	2008	6,920.50	39,157.88	17.67
1993	127.12	1,259.07	10.10	2009	9,102.05	44,285.56	20.55
1994	143.42	1,762.81	8.14	2010	10,157.02	54,612.26	18.60
1995	180.00	2,895.20	6.22	2011	10,660.07	62,980.40	16.93
1996	238.60	3,779.13	6.31	2012	14,649.28	71,713.94	20.43
1997	316.21	4,111.64	7.69	2013	15,751.84	80,092.56	19.67
1998	351.96	4,588.99	7.67	2014	17,131.45	89,043.62	19.24
1999	431.17	5,307.36	8.12	2015	18,675.47	94,144.96	19.84
2000	530.37	6,897.48	7.69	2016	21,082.72	101,489.49	20.77
2001	764.96	8,134.14	9.40	2017	22,092.04	113,711.63	19.43
2002	930.49	11,332.25	8.21	2018	22,521.93	127,762.55	17.63

**Source:** Author's Computation from Central Bank of Nigeria (CBN) Statistical Bulletin, 2018

### Growth in Intermediation Efficiency

Banking sector intermediation efficiency is measured by the ratio of currency outside banks to broad money supply. Currency outside banks refers to those currencies that are physically used to conduct transactions between consumers and businesses and which are not stored in the bank, financial institution or central bank. Broad money supply includes bank money and any cash held in easily accessible accounts. The current measure of broad money supply in Nigeria is M3. However, banking sector intermediation efficiency is the ease at which funds are transferred from the surplus sectors of the economy to the deficit sectors of the economy for productive investment that will spur economic growth.

**Table 3: Nigerian Banking Sector Intermediation Efficiency (COB/M2) from 1987-2008**

Year	COB(₦billions)	M2(₦billions)	COB/M2 (%)	Year	COB(₦billions)	M2(₦billion)	COB/M2 (%)
1987	6.30	27.57	22.85	2003	412.16	1,952.92	21.10
1988	9.41	38.36	24.53	2004	458.59	2,131.82	21.51
1989	9.76	45.90	21.26	2005	563.23	2,637.91	21.35
1990	14.95	47.42	31.53	2006	650.94	3,797.91	17.14
1991	23.12	75.40	30.66	2007	737.87	5,127.40	14.39
1992	36.76	111.11	33.08	2008	892.68	8,008.20	11.15
1993	57.85	165.34	34.99	2009	927.24	9,411.11	9.85
1994	90.60	230.29	39.34	2010	1,082.30	11,034.94	9.81
1995	106.84	289.09	36.96	2011	1,245.14	12,172.49	10.23
1996	116.12	345.85	33.58	2012	1,301.16	13,893.22	9.37
1997	130.67	413.28	31.62	2013	1,444.66	15,154.64	9.53
1998	156.72	488.15	32.10	2014	1,437.40	16,238.52	8.85
1999	186.46	628.95	29.65	2015	1,456.10	18,525.22	7.86
2000	274.01	878.46	31.19	2016	1,820.42	21,624.63	8.42
2001	338.67	1,269.32	26.68	2017	1,782.66	22,363.43	7.97
2002	386.94	1,505.96	25.69	2018	1,912.98	25,079.72	7.63

**Source:** Author's Computation from Central Bank of Nigeria (CBN) Statistical Bulletin, 2018

CBN (2018) observes that there was an improvement in intermediation efficiency indicator, measured by the ratio of currency outside banks to broad money supply, which stood at 7.63 per cent in 2018, from 7.97 per cent at end-December 2017.

#### **Growth in Total Assets**

A typical bank's asset consists of all forms of personal and commercial loans, mortgages and securities. Central Bank of Nigeria grouped Deposit Money Bank's assets into the following categories: reserves, claims on Central Bank, foreign assets, claims on Central Government, claims on state and local Government, claims on private sector, financial derivatives and unclassified assets.

However, bank's total assets in Nigeria increased from N49.83 billion in 1987 to N17,522.86 billion in 2009. It dropped slightly to N17,331.56 billion in 2010 and then rose sharply to N37,206.99 billion in 2018.

#### **Table 4: Bank's Total Asset and Ratio of Bank's Total Asset to GDP (1987-2018)**

Year	Bank's Total Asset (₦'billions)	GDP at Current Basic Prices (₦'billions)	Ratio of Bank's Total Asset to GDP (%)	Year	Bank's Total Asset (₦'billions)	GDP at Current Basic Prices (₦'billions)	Ratio of Bank's Total Asset to GDP (%)
1987	49.83	249.44	19.98	2003	3,047.86	13,301.56	22.91
1988	58.03	320.33	18.12	2004	3,753.28	17,321.30	21.67
1989	64.87	419.20	15.47	2005	4,515.12	22,269.98	20.27
1990	82.96	499.68	16.60	2006	7,172.93	28,662.47	25.03
1991	117.51	596.04	19.72	2007	10,981.69	32,995.38	33.28
1992	159.19	909.80	17.50	2008	15,919.56	39,157.88	40.65
1993	226.16	1,259.07	17.96	2009	17,522.86	44,285.56	39.57
1994	295.03	1,762.81	16.74	2010	17,331.56	54,612.26	31.74
1995	385.14	2,895.20	13.30	2011	19,396.63	62,980.40	30.80
1996	458.78	3,779.13	12.14	2012	21,288.14	71,713.94	29.68
1997	584.38	4,111.64	14.21	2013	24,301.21	80,092.56	30.34
1998	694.62	4,588.99	15.14	2014	27,526.42	89,043.62	30.91
1999	1,070.02	5,307.36	20.16	2015	28,173.26	94,144.96	29.93
2000	1,568.84	6,897.48	22.75	2016	31,682.82	101,489.49	31.22
2001	2,247.04	8,134.14	27.62	2017	34,593.89	113,711.63	30.42
2002	2,766.88	11,332.25	24.42	2018	37,206.99	127,762.55	29.12

**Source:** Author's Computation from Central Bank of Nigeria (CBN) Statistical Bulletin, 2018

On the other hand, there has been fluctuation in bank's total asset/GDP ratio as it fell from 19.98 percent in 1987 to 15.47 percent in 1989. It also experienced a decline from 17.96 percent in 1993 to 12.14 percent in 1996 but increased rapidly to 27.62 percent in 2001. It equally experienced a tremendous increase from 20.27 percent in 2005 to 40.65 percent in 2008 due to the recapitalization exercise that saw the increase in capital base from N2 billion to N25 billion. Nonetheless, there was a drop to 29.68 percent in 2012. In recent time, it dropped slightly from 30.42 percent in 2017 to 29.12 percent in 2018.

### **Banking Sector Intermediation Development and Economic Growth: Theoretical and Empirical Framework**

A well-structured banking sector mostly decreases costs of transactions and constraints of credits, conditions that may delay the growth of economy in a country. A banking sector that is not effective can by its ineffectiveness result in little activity and economic growth. The banking sector does propel economic growth through its investment function. Banks invest its excess deposit on real investment such as real estate, partnering with private individuals in real production of goods, procuring and leasing of equipment etc.

The theory financial intermediation that was first put forth by Schumpeter (1911) and later supported by the works of Shaw (1973), McKinnon (1973), Gupta (1984), Fry (1988), Greenwood and Jovanovic (1990), Bencivenga and Smith (1991) among others, postulates that financial expansion causes the economy to grow. The theory posits that a strong developed sector of finance facilitates vital services that reduce transaction, information and monitoring costs and enhance the effectiveness of intermediation. As such, it identifies and funds good business projects, mobilizes savings, enables trading and risks diversification, promotes exchange of services and goods, monitors the performance of managers. All these services result in effective allotment of resources; lead to a quick increase of human and physical capital; and enables faster technological innovation. This eventually brings the outcome into faster and long-term economic growth (Schumpeter, 1911). Previous empirical studies in Nigeria and in other countries of the world have found a positive relationship between financial and banking sector development and economic growth. Some found a negative relationship.

Ayunku and Etale (2014) examined the relationship between banking sector development and economic growth in Nigeria. The result of the study revealed that trade openness, domestic credit and interest rate have positive relationship with real GDP while credit to private sector and deposit liabilities have negative relationship with real GDP. The result of their study lends very strong support to the existence of a



short and long-run relationship between banking sector development and economic growth in Nigeria. Similarly, Tripathy and Pradhan (2014) extended the study to the Indian economy by investigating the short run as well as long-run relationships and also the causality relationships between banking sector development and the economic growth between the period of 1960 and 2011. They found strong evidence that banking sector development caused economic growth in the Indian economy. In another related study, Aigbovo and Uwubamwen (2014) included the stock market segment in their study to examine the short-run and long-run relationships between financial system development and economic growth in Nigeria. The Granger causality test was used to determine the direction of causality among the variables. The findings of the study were that financial development (measured by banking system and stock market development) positively influenced economic growth in Nigeria; that causality runs from finance to growth in the finance-growth nexus.

In a cross country study, Petkouski and Kjosevski (2014) examined the relation between banking sector development and economic growth in 16 transitional economies from Central and South Eastern Europe and they showed that credit to the private sector and interest margin were negatively related to the economic growth while ratio of quasi money was positively related to economic growth. In the same vein, Murari (2017) explored the relationship between financial development and economic growth, using a panel data of South Asian middle-income countries for the years 1980–2013. The results indicate that the domestic credit provided by the banking sector has a significant association with economic growth in both directions but domestic credit to the private sector is associated with the economic growth in forward direction only, which confirms dearth in credit allocation in the region and suggests pathetic financial regulation and supervision. In a more recent study, Constantinou, Sofoklis and Joseph (2018) assessed the relationship between the financial sector and economic growth in 34 European and commonwealth of independent states economies. Their results suggested that there has been a link between financial sector and the real economy.

Dritsakis and Adamopoulos (2001) empirically examined the causal relationship between the degree of openness of an economy, financial development and economic growth by using a multivariate autoregressive VAR model in Greece for the period of 1960 quarter one to 2000 quarter four. The granger causality tests based on error correction models show that there is a causal relationship between financial development and economic growth and also between the degree of openness of the economy and economic growth. Keho (2010) interacted inflation rate in their model to analyze whether the strength of the relationship between finance and growth depends on inflation rate using time series data of seven African countries. The empirical findings did not provide significant evidence of nonlinearity in the finance-growth relationship. Financial development has no significant effect on economic growth regardless of the level of inflation. Also, Kyophilavong, Uddin, and Shahbaz (2016) examined the nexus between financial development and economic growth by testing the supply-leading hypothesis and demand-following hypothesis using time series data from Lao PDR. Using the autoregressive distributed lag (ARDL) bound testing approach to cointegration, the result confirmed the feedback effect between both of the variables. Financial development promotes economic growth and as a result, economic growth leads to financial development.

Panicos and Siong (2006) evaluated the relationship between finance, institutions and economic development using data from 72 countries for the period 1978–2000. They found that financial development has larger effects on GDP per capita when the financial system is embedded within a sound institutional framework. Moreover, they found that financial development is most potent in middle-income countries, where its effects are particularly large when institutional quality is high. Importantly, they also found that in low-income countries, the influence of financial development is at its weakest; in these countries, more finance without sound institutions may not succeed in delivering long-run economic benefits. Moreover, the study conducted by Malarvizhi, Zeynali, Mamun and Ahmad (2018) on the relationship between financial sector development and economic growth of ASEAN-5 countries (Malaysia, Indonesia, Singapore, Thailand and Philippines) from 1980 to 2011 also revealed that financial development has a significant positive effect on economic growth.

Awdeh (2012) studied the causality direction between banking sector development and economic growth in Lebanon over the period 1992–2011 and found a one way causality running from economic growth to banking sector measures such as deposit growth and credit to local private sector. In another causality approach, Helmi, Rashid and Bedri (2014) investigated the causal relationship between financial development and economic growth in Gulf Cooperation Council (GCC) countries that is, Bahrain, Oman, Kuwait, Qatar, United Arab Emirates and Saudi Arabia over the period of 1980 to 2012. Using error correction model and cointegration techniques to detect the long-run and short-run causalities between the variables, their overall empirical results revealed that financial sector development contributes significantly to economic growth in GCC countries.

King and Levine (1993a) studied a sample of 80 countries and concluded a strong positive relation between financial development and economic growth. Also, King and Levine (1993b) studied a sample of 70 countries and examined the impact of financial development on economic growth, capital accumulation and economic factor productivity and found a strong link between financial development and growth. Levine, Loayza and Beck (2000) evaluated the role of financial development in motivating economic growth and found that higher banking sector development implies higher economic growth and total factor productivity growth. Levine (2005) studied the influence of

bank system development and stock markets on economic growth by sampling eleven Arab countries, he concluded that countries with undeveloped financial systems affects negatively the economic growth of those countries. He stressed that a sound financial system is vital. Hence Levine studied a negative link between banking development and growth of economy due to an inadequately developed financial banking system.

However, from the above empirical literature, credit to private sector, interest rate and bank deposit has been commonly used by most scholars as a measure of banking sector development. Our study is unique and contributes to the empirical debates by introducing new variables such as number of bank branches, bank's total assets and bank's intermediation efficiency as a measure of banking sector development.

### Analytical Model

The regression model that was used in this study comprised of one dependent variable, four independent variables and three control variables. Data for the variables were compiled from World Bank, World Development Indicators and Central Bank of Nigeria (CBN) statistical bulletin 2018. Dependent variable was economic growth proxied by real Gross domestic product (RGDP). While variables that were independent include: number of bank branches, ratio of credit to private sector to GDP (CPS/GDP), banking sector intermediation efficiency proxied by ratio of currency outside bank to broad money supply (COB/M2) and ratio of bank's total assets to GDP (BTA/GDP). The control variables include lending interest rate, export and Government expenditure. The lending rate refers to the rate at which Commercial banks grant loans to the productive sector of the economy. Higher bank lending rate discourages people from borrowing for investment purposes and will in turn reduce the level of investment and economic growth and vice versa. Commercial bank lending rate to the productive sectors is usually influenced by the Central Bank rate. Export represents goods or services that are sold abroad. Export trade is an instrument for growth as it increases foreign exchange earnings, improves balance of payment position, creates employment and development of export oriented industries in the manufacturing sector and improves government revenue through taxes, levies and tariffs. These benefits will in turn enhance the process of growth and development in such economy. Finally, Government expenditure on infrastructure such as road, transport, defense power supply, health etc. will increase investment and economic growth.

However, the regression model is been shown as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \epsilon$$

Transforming the above equation into natural logarithm, we have

$$\text{Log}Y = \alpha + \beta_1 \text{Log}X_1 + \beta_2 \text{Log}X_2 + \beta_3 \text{Log}X_3 + \beta_4 \text{Log}X_4 + \beta_5 \text{Log}X_5 + \beta_6 \text{Log}X_6 + \beta_7 \text{Log}X_7 + \epsilon$$

Where:

LogY= Log of Economic growth which was measured by the real GDP,

$\alpha$ = Regression constant,

LogX1= Log of Number of Bank Branches (NBB)

LogX2= Log of Ratio of Credit to Private Sector to GDP (RCPS)

LogX3= Log of Ratio of Currency Outside Bank to Broad Money Supply (COB/M2)

LogX4= Log of Ratio of Bank Total Asset to GDP (RBTA)

LogX5= Log of Lending Interest Rate (LINTR)

LogX6= Log of Export of Goods and Services (% of GDP) (EXP)

LogX7= Log of General Government Final Consumption Expenditure (% of GDP) (GOVEXP)

$\epsilon$ = Error term normally distributed about the mean of Zero and

**$\beta_1, 2, 3, 4, 5, 6, 7$**  = Regression coefficients of the variations to determine the volatility of each variable to economic growth in the regression model. The variables were logged because most time series data have an unequal variance (heteroskedastic in nature), thus the natural logarithm helps to stabilize the variance within the sample, which helps to improve our analysis.

## Population and Sample Size

Population according to Onwumere (2005), represents a universe or elements with similar characteristics, hence it is a census of all relevant elements and may be finite or infinite while a sample is a group of variables or items derived from a relevant population for the purpose of examination or analysis. Based on this, the population of this study will comprise of all banks in Nigeria such as Deposit Money Banks, Micro finance banks, Merchant banks and Non-interest banks. These banks are involved in financial intermediation in one form or the other. Sequel to the fact that there may be obvious difficulties in studying the entire population due to the pattern and size of distribution, sufficient knowledge of the entire population will be gotten from studying a sample of the population.

The sample of this study shall be the Deposit Money Banks in Nigeria. The choice of these banks is based on the fact that they are the dominant institution of financial intermediation in Nigeria and hence, holds the largest proportion of household savings and also based on the availability of data on the variables. The sample size will also cover a period of 1987 to 2018. The choice of this period is based the fact that it was the period of the post structural adjustment programme (SAP) during which the financial sector was deregulated and thus paved way for the entrance of new banks. There were more banks intermediating between the surplus sectors and the deficit sectors.

## Estimation Procedure

In the determination of the relationship between banking sector intermediation development and economic growth in Nigeria, the study employed dynamic ordinary least square (DOLS) regression analysis. The DOLS model is a robust single equation approach which corrects for endogeneity and correlation by including lags and leads of first-difference variables. Descriptive statistics of the variables were presented and unit root test was conducted to ensure that the time series analysis is free from stationarity defects. Also, Johansen cointegration test and error correction model were estimated. In the event that variables in the model exhibit a long-run harmonious relationship (cointegrated), it may be necessary to determine the speed of adjustment of economic towards a steady state in response to systemic change.

## Analysis And Discussion Of Results

**Table 5: Summary of Descriptive Statistics**

	RGDP	NDBB	RCPS	RCOBM2	RBTA	LINTR	EXP	GOVEXP
Mean	37296.88	3528.438	11.82500	21.30844	24.04281	19.27251	21.62012	4.019241
Median	30333.58	3118.000	8.355000	21.43000	22.83000	18.06625	21.28533	2.135947
Maximum	69810.02	5807.000	20.77000	39.34000	40.65000	31.65000	36.02327	9.448340
Minimum	15263.93	1476.000	6.220000	7.630000	12.14000	13.96167	9.218110	0.911235
Std. Dev.	19340.02	1550.683	5.529135	10.46103	7.610416	3.598424	6.576541	3.029960
Skewness	0.530700	0.348469	0.620620	0.033967	0.344684	1.495187	-0.010119	0.555239
Kurtosis	1.715475	1.432434	1.566210	1.544323	2.224174	5.662222	2.487315	1.772161
Jarque-Bera	3.702096	3.923982	4.795242	2.831482	1.436178	21.37302	0.351008	3.654335
Probability	0.157072	0.140578	0.090934	0.242746	0.487683	0.10402023	0.839034	0.160869
Sum	1193500.	112910.0	378.4000	681.8700	769.3700	616.7202	691.8438	128.6157
Sum Sq. Dev.	1.16E+10	74543162	947.7112	3392.427	1795.471	401.4084	1340.778	284.6004
Observations	32	32	32	32	32	32	32	32

From the table above, the time series residual variable data of all the variables are normally distributed as the probability of the Jarque-Bera statistic is absolutely greater than the critical value of 0.05 hence the null hypothesis (H0) is rejected in favour of the alternative (H1) that the residual of the distribution of the model is normally distributed.

## Unit Root Test

In statistics, a unit root test tests whether a time series variable is non-stationary and possesses a unit root. The null hypothesis is defined as the presence of a unit root and the alternative hypothesis is defined as stationarity or variables have no unit root. The present study uses augmented Dickey Fuller (ADF) unit root test to examine the stationarity of the data series. It consists of running a regression of the first difference of the series against the series lagged once, lagged difference terms and optionally, a constant and a time trend. This can be expressed as follows:

$$\Delta Y_t = \alpha_0 + \alpha_1 t + \alpha_2 Y_{t-1} + \sum_{j=1}^p \alpha_j \Delta Y_{t-j} + \varepsilon_t$$

The additional lagged terms are included to ensure that the errors are uncorrelated. In this ADF procedure, the test for a unit root is conducted on the coefficient of  $Y_{t-1}$  in the regression. If the coefficient is significantly different from zero, then the hypothesis that  $Y_t$  contains a unit root is rejected. Rejection of the null hypothesis implies stationarity. Precisely, the null hypothesis is that the variable  $Y_t$  is a non-stationary series ( $H_0: \alpha_2 = 0$ ) and is rejected when  $\alpha_2$  is significantly negative ( $H_a: \alpha_2 < 0$ ). If the calculated value of ADF statistic is higher than McKinnon's critical values, then the null hypothesis ( $H_0$ ) is not rejected and the series is non-stationary or not integrated of order zero, I(0). Alternatively, rejection of the null hypothesis implies stationarity. Failure to reject the null hypothesis leads to conducting the test on the difference of the series, so further differencing is conducted until stationarity is reached and the null hypothesis is rejected. If the time series (variables) are non-stationary in their levels, they can be integrated with I(1), when their first differences are stationary.

**Table 6: Summary of Unit Root Test Result using Augmented Dickey Fuller (ADF)**

Variables	ADF T-statistics	Order of Integration	Test Result
RGDP	-7.362490*	1(1)	Stationary
NDBB	-4.262784*	1(1)	Stationary
RCPS	-4.950483*	1(1)	Stationary
RCOBM2	-5.367427*	1(1)	Stationary
RTBA	-3.714984*	1(1)	Stationary
LINTR	-7.247732*	1(1)	Stationary
EXP	-7.071690*	1(1)	Stationary
GOVEXP	-5.593972*	1(1)	Stationary

Note: \* denotes significant at 1% level

From the above unit root test result, all variables were found to be stationary at first difference and as such we can go on and use the variables for further analysis. The optimal lag for ADF test is selected based on the Akaike info Criteria (AIC).

### Cointegration Test

This study employs VAR based approach of Johansen and Juselius (1990) test which proposes the use of two likelihood ratio tests. The co-integration test was performed to ascertain the long run relationship between the variables that were captured in the model.

**The Trace test:** The trace statistic for the null hypothesis of co-integrating relations is computed as follows:

m

$$\Gamma_{\text{trace}}(r) = -\sum_{i=1}^m \log [1 - \lambda_i]$$

i=1

**Maximum eigenvalue static** tests the null hypothesis of r co-integrating relation against r + 1 co-integrating relations and is computed as follows:

$$\Gamma_{\text{max}}(r, r + 1) = -\log (1 - \lambda_{r+1})$$

The trace values and the maximum eigen values are then compared with the critical value at 5% level. If at most one trace value and the maximum eigen value exceeds the critical value at 5% level, then the null hypothesis of no co-integration is rejected, hence there is co-integration and vice versa.

**Table 7: Johansen Cointegration Test Result**

Hypothesized		Trace	0.05		Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**	No. of CE(s)	Statistic	Critical Value	Prob.**	
None *	0.950696	305.7239	159.5297	0.0000	None *	90.29268	52.36261	0.0000	
At most 1 *	0.932617	215.4313	125.6154	0.0000	At most 1 *	80.92083	46.23142	0.0000	
At most 2 *	0.732617	134.5104	95.75366	0.0000	At most 2	39.57223	40.07757	0.0569	
At most 3 *	0.714906	94.93819	69.81889	0.0002	At most 3 *	37.64813	33.87687	0.0169	
At most 4 *	0.523141	57.29006	47.85613	0.0051	At most 4	22.21601	27.58434	0.2095	
At most 5 *	0.445730	35.07405	29.79707	0.0112	At most 5	17.70311	21.13162	0.1414	
At most 6 *	0.400294	17.37094	15.49471	0.0258	At most 6 *	15.33949	14.26460	0.0337	
At most 7	0.065473	2.031456	3.841466	0.1541	At most 7	2.031456	3.841466	0.1541	

Cointegration of variables is an indication that they move together in harmony and are most likely to converge in the long run, which augurs well for policy making. Cointegration results are reported in Table 7 and indicate that maximum Eigen-statistic and trace-statistic reject the first null hypothesis of no cointegrating relation among variables at the 5 per cent level of significance. The second hypothesis of at most one cointegrating relationship is also rejected. It follows that two or more cointegrating relationships exist among the variables; hence they are most likely to converge in the long run. The maximum Eigen-statistic and trace-statistic show similar results, confirming that the unit root coefficients of cointegrating vectors are significant at the 5 per cent level. This implies the variables are indeed cointegrated and results are not significantly sensitive to choice of test statistic. Since the variables are all found to be stationary in first differences and also cointegrated, the model is estimated by employing DOLS and ECM estimation techniques.

### Regression Analysis and Interpretations

**Table 8: Dynamic Ordinary Least Square (DOLS) Regression Analysis**

Dependent Variable	Explanatory Variables	Coefficient	t-Statistic	Regression Diagnostic
Real GDP	NDBB	1.183171* (0.026978)	43.85733	Adjusted R-squared = 0.92
	RCPS	-0.133236 (0.043854)	-3.038171	S.E. of regression = 0.011370
	RCOBM2	0.273776 (0.074456)	3.677038	Long-run variance = 2.22E-05
	RBTA	0.838112*** (0.119734)	6.999811	Mean dependent var = 10.42001
	LINTR	-0.384804 (0.135476)	-2.840380	S.D. dependent var = 0.489983
	EXP	-0.322782*** (0.032439)	-9.950521	Sum squared resid = 0.000129
	GOVEXP	-0.111568*** (0.014816)	-7.530259	

Note: Robust standard errors are in bracket. \* and \*\*\* denotes significant at 1% and 10% level respectively. Number of observation is 29.

From the DOLS result, it can be observed that it is only number of Deposit Money Bank branches and bank's total asset that have positive and significant relationship with economic growth in Nigeria. An increase in number of Deposit money banks branches and ratio of bank total asset to GDP led to a 118% and 84% increase in economic growth of Nigeria respectively. This positive and significant relationship between number of bank branches and economic growth in Nigeria is due to the fact that branch network expansion remains one of the traditional and most effective methods used by Nigerian banks in mobilizing funds from the public for onward lending to the deficit economic units. As stated earlier, banks in developed countries such as USA, Canada, Australia, Germany, United Kingdom e.t.c, uses the electronic channels such as the Automated teller machine (ATM) to mobilize more deposit from the public as their ATM can perform both deposit and withdrawal operations. But in a developing country like Nigeria, the ATM is currently deemed as simply a cash dispensing machine as only withdrawals can be made. Hence, bank branches remain the only channel where cash deposit transactions can be made by the public. The branches are usually located in areas with high population growth and business activities for enhanced deposit mobilization.

Contrary to expectation, credit to private sector has negative and insignificant relationship with economic growth in Nigeria. A one percent increase in credit to private sector led to 13% decrease in economic growth of Nigeria. These negative relationship between credit to private sector and economic growth could also be attributed to the fact that most individuals in Nigeria who are opportune to obtain credit from banks tend to divert the loan to unproductive ventures such as acquiring expensive cars, private apartment and other luxuries rather than investing it in productive projects that will likely spur economic growth. Also, it could be attributed to the inefficiency of the Nigerian banking sector and the poor quality of bank's risk selection policy. The negative relationship between ratio of credit to private sector to GDP and economic was in support of the findings of Ayunku and Etale (2014) and Petkouski and Kjosevski (2014). While it disagreed with the findings of Murari (2017) whose results indicate that the domestic credit provided by the banking sector has a significant association with economic growth.

Also, the ratio of currency outside bank to broad money supply which is a measure of bank's intermediation efficiency has positive and insignificant relationship with economic growth in Nigeria. A one percent rise in bank's intermediation efficiency led to 27% increase in economic growth of Nigeria. Finally, the control variables export and Government expenditure have negative and significant relationship with economic growth at 10% level of significance while lending interest rate had negative and insignificant relationship with economic growth in Nigeria.

The adjusted R2 indicates all variables together account for 92 per cent of systemic variation in economic growth of Nigeria.

#### **Table 9: Error Correction Model Results**

Variable	Coefficient	t-Statistic	Regression Diagnostic
C	0.043367* (0.006615)	6.555591	Adjusted R-squared = 0.83
NDBB(-1)	0.163564** (0.070935)	2.305838	S.E. of regression = 0.031382
DLRCPS(-1)	-0.006356 (0.051101)	-0.124379	Log likelihood = 66.62712
RCOBM2(-1)	0.018161 (0.059207)	0.306742	Mean dependent var = 0.048661
RBTA(-1)	-0.050027 (0.056359)	-0.887642	S.D. dependent var = 0.036562
LINTR(-1)	0.062237 (0.044856)	1.387490	Sum squared resid = 0.020682
EXP(-1)	0.007841 (0.020382)	0.384719	
GOVEXP(-1)	0.005913 (0.016041)	0.368597	
ECM(-1)	-0.578199** (0.231648)	-2.496023	

Note: Robust standard errors are in bracket. \* and \*\* denotes significant at 1% and 5% level respectively.

The main focus in the estimation of error correction model is an adjustment of economic towards equilibrium when a systemic change occurs as indicated by the coefficients of ECM-1 in the table 9. The adjustment coefficient of  $-0.578$  for indicates that economic growth adjusts by 58 per cent per year. This implies that full adjustment to a steady state takes about 2years and 2months.

## Conclusion

The prime objective of this study is to determine the relationship between banking sector intermediation development and economic growth by adding lending interest rate, export and Government expenditure as a control variable from 1987 to 2018 with evidence from Nigeria. The stationary of data is checked by the Augmented Dickey Fuller (ADF) unit root test and this test confirms integrated order at first difference. We have applied the Johansen cointegration to explore the cointegration between variables. The results confirm the existence of the long-run relationship between banking sector intermediation development and economic growth in Nigeria. However, in the short run, only number of bank branches and bank's total asset have a positive and significant impact on economic growth. Credit to private sector has negative and insignificant relationship with economic growth while bank's intermediation efficiency has positive and insignificant relationship with economic growth. The control variables export and Government expenditure have negative and significant relationship with economic growth while lending interest rate has negative and insignificant relationship with economic growth in Nigeria.

The result of the analysis has proven that number of Deposit money Bank branches and bank's total asset is the major driver of economic growth in Nigeria. This shows that much of Nigeria's superior growth performance is attributed to increase in the number of bank branches and growth in bank's assets. However, growth in credit to private sector was found to be negative and insignificant. This shows that the credit given to private sectors is not effectively utilized for productive investment that will spur economic growth. Most entrepreneurs who are opportune to obtain credit from banks in Nigeria tend to divert it to unproductive ventures and thus reducing the level of investment in the country. The calls for policy makers to develop good policy measures that will ensure that bank credit are utilized for productive investment that will spur economic growth. The study contributes to knowledge as it provides a good policy recommendation that will help address the negative relationship between credit to private sectors and economic growth in Nigeria and in other developing countries of the world. Extant literatures have not been able to address this challenge.

## Policy Recommendations

Going by the above stated findings and the conclusions drawn from them, the following recommendations are hereby made by the study;

1. Records indicate that large chunk of deposits are lying idle under pillows and in bamboos in the rural areas being left out of the banking stream. Therefore, it is recommended that banks should increase ways to approach and mobilize the huge deposits lying in the unbanked group. This can be achieved by setting up mini branches in the remote rural areas. This will help increase the volume of deposit that will be made available for investment purposes.
2. Bank managers should restructure their requirements for loan application by mandating borrowers to prepare and provide a list of all the expenses they want to embark upon with the loan and their supplier's account details such that the bank will transfer the funds directly to the supplier's account for the payment of all expenses to be incurred by the borrower with the loan rather than transferring it directly to the borrower's account of which they may end up diverting the loan to unproductive ventures. This measure will ensure that loans obtained for productive investment are utilized for the purpose for which they are meant for and will invariably increase the level of investment and economic growth of the country.
3. Banks should review their deposit interest rate by fixing it base on the level of customer's deposit such that those who deposit huge amount of their surplus income should earn higher interest rate rather than having a uniform rate for all classes of depositors. This will encourage people to save more and will in turn enhance intermediation efficiency.
4. The Central Bank of Nigeria should from time to time review the asset base of banks so as to measure up with international standard in order to increase investment and economic growth.

### Scope of Further Research

The study was limited only on the Nigerian economy. Thus, future research should focus on the entire African economy to test whether the relationships uncovered by the present study holds true across Africa and may provide more viable results.

## Declarations

**Availability of data and materials:** The data utilized in this paper are available upon request from the author.

**Competing interest:** The author has declared that there is no potential conflict of interest in this research work.

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