DETERMINANTS OF DEPOSIT MONEY BANK CREDIT TO MANUFACTURING SECTOR IN NIGERIA

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ABSTRACT

This study examined the determinants of deposit money bank credit to the manufacturing sector in Nigeria. Specifically, the effect of macroeconomic factors, proxied by inflation rate (INF), liquidity ratio (LQD), loan to deposit ratio (LTDR) and prime lending rate (PLR) on DMBs' credit was evaluated. Annual time series data spanning from 1986 to 2021 sourced mainly from CBN Statistical Bulletin was used. The study employed Augmented Dickey-Fuller test (ADF) and Autoregressive Distributed Lag (ARDL) estimation techniques. Findings revealed that INF and PLR have positive but insignificant effect on DMBs' credit in the long run. Also LTD ratio has positive significant effect in the short run, while liquidity ratio affects banks' credit negatively both in the short and long run. Moreover, results showed short run causality from explanatory variables to deposit money banks' credit. The study concluded that INF, LTDR, LQR and PLR are critical factors that influence DMBs' credit to manufacturing sectors. Therefore, it is recommended that the Central Bank of Nigeria should formulate favorable monetary and macroeconomic policies in order to encourage banks' lending to manufacturing firms in Nigeria thereby enhancing economic growth.
Keywords: Bank credit, determinants, economic growth, financial intermediation.

INTRODUCTION

The manufacturing sector contributes significantly to the development of Nigeria's economy. The sector is responsible for transforming crude materials into finished goods. It creates employment, boosts agriculture, diversifies the economy and helps the nation increase its foreign exchange earnings. Gbadebo et al. (2017) asserts that the sector acts as a catalyst that accelerates the pace of structural transformation and diversification of economies, enabling countries to fully utilize their factor endowments for economic growth, development and sustainability. Moreover, in terms of contribution to Gross Domestic Product (GDP), the manufacturing sector is dominant and has overtaken the service sector in a number of Organization for Economic Co-operation and development (OECD) countries (Anyanwu, 2010).

Regrettably however, Nigeria, regardless of its enormous natural endowments has been a pathetic case as the manufacturing sector still accounts for a very low percentage of its GDP. Also, the efforts of government towards spurring industrialization by increasing the output of manufacturing sector has proved abortive. This is a cause for worry even as the nation's quest to becoming a leading world economy increases (Omankhanlen & Owonibi, 2012). Omankhanlen and Owonibi (2012) observed that this sector is riddled with multifarious challenges like poor capital mix, poor credit facilities, budget deficits, macroeconomic instability.

However, the author emphasized that the major challenges bedeviling the sector are suffocating high interest rate and banks' unwillingness to lend to the sector even though the monetary authorities classify it as a priority sector. Abubakar and Gani (2013) also asserted that the

manufacturing sector in Nigeria still experience declining growth due to difficulty in accessing financial resources especially from the banks that hold about 90% of the total financial sector assets and concentrate their loans to the oil and gas sectors.

This showed that Deposit Money Bank (DMB) credits plays prominent role in the efficient and effective performance of the manufacturing sector. Its availability plays a crucial role in boosting economic growth, especially in emerging markets and developing countries (Imran & Nishat, 2013). These credits have improved investment leading to growth in the manufacturing sector and through them, banks' performance objectives are expected to be met (Casolaro et al., 2002).

However, in spite of continuous policy strategy to attract credits to the manufacturing sector, the Nigerian manufacturing enterprises have remained unattractive for DMBs credits at low lending rate (Ogar et al., 2014). For instance, as indicated in the central bank of Nigeria (CBN report, 2009), almost throughout the regulatory era, commercial banks loans and advances to the manufacturing sector deviated persistently from prescribed minima. Moreover, bank lending slightly decreased negatively in 2017 and 2018 with (-2.3%) and (-3.9%) changes respectively (CBN, 2021).

Observing the trend of DMB credit to manufacturing sectors in the last few decades indicate that the willingness of banks to provide credit to the manufacturing sector is contingent upon several factors. These factors are considered critical in the process of industrialization and as such, governments over the years have made attempts at mitigating the unfavorable business environment currently prevalent. It is argued that the fastest channel through which an economy can be transformed from having a predominantly traditional sector to a modern sector is investing in the manufacturing sector in order to increase industrial capacity and technological innovation. Consequently, this study aims to examine the determinants of DMB credit to manufacturing sector in Nigeria. The study thus formulated the following null hypotheses:

Ho_1: Inflation rate has no effect on DMB credit to manufacturing sector in Nigeria.

Ho_2: Liquidity ratio does not affect DMB credit to manufacturing sector in Nigeria.

Ho_3: Loan to deposit ratio does not affect DMB credit to manufacturing sector in Nigeria.

Ho_4: Prime lending rate has no significant effect on DMB credit to manufacturing sector in Nigeria.

Literature Review

Theoretical Review

The foundational theory of this study is the bank lending channel theory (Bernanke & Blinder, 1988) which is built on the studies of Tobin (1969) and Brunner and Meltzer (1972). The theory hypothesizes that monetary policy changes would alter supply of intermediate loans, in specific, loans supplied by DMBs. The theory posits that monetary policy decisions will affect the provision of loans available to banks (i.e. the liabilities of the bank) and thus the overall amount of loans that they can provide (i.e. assets of the banks). According to the model of Bernanke and Blinder (1988), it highlights that three essential conditions must prevail in order to ensure the existence of a distinct bank lending channel of monetary policy transmission which include (i) open-market bonds and intermediated loans must not be perfect substitutes; (ii) monetary authorities should be able to influence the supply of intermediated loans by altering the quantity of reserves in the banking system; and (iii) there must be imperfect price adjustment that prevents the neutrality of any monetary policy shock.

Grodzicki et al. (2000) postulated that the existence of a bank lending channel is based on two essential assumptions: monetary policy decisions affect the liquidity position of banks and changes in the supply of loan from banks affect borrowers due to limited access to other substitute sources of finance. Oyebowale (2020) also posited that monetary authorities use the bank lending channel to implement monetary policies within an economy. For instance, an expansionary monetary policy through the bank lending channel increases bank deposits and reserves, causing an increase in the availability of bank loans to boost investment and consumer spending.

Concept of Bank Credit

The term banks' credit refers to the amount of credit available to an individual, business or corporate borrower from a banking institution in form of loans advances. In other words, it is the total amount of credit available to a group of businesses in the same or different sectors of an economy from a banking institution for developmental projects or investment purposes in order to step up economic growth. CBN (2003) defines bank credit as the amount of loans and advances given by the banking sector to the various economic agents. Similarly, Nigerian Deposit Insurance Corporation (NDIC) Prudential Guidelines (1990) describes bank credit as the combination of all loans, advances, guarantee, overdraft, lease, commercial papers, bills discounted and banker acceptance. Banks' credit can either be in short-term, medium-term or long-term forms. While short term credit can be used in financing working capital, medium- and long-term credit can majorly be used in financing long term investment for productive purposes (Akindutire, 2021).

Ndifong and Ubana (2014) explained that DMBs being a generic name for commercial and merchant banks operating in the country since the commencement of universal banking in 2001 hence DMBs credit is the borrowing ability of these universal banks to provide loans to individual, government, or organization. Nwanyanwu (2010) stated that credit is the money given to borrower from a lender. Banks and credits are financial twins that influence each other. Thus, banks act as a channel for fund from surplus economic units to deficit sectors with productive investment opportunities. Agbanike et al. (2016) defined credit allocation as the channel through which resources are transferred for viable investment activities in terms of capital formation which lead to growth in the output of different priority sectors of the economy.

Banking sector in Nigeria has gone through a number of different phases namely; the free banking era (1892–1952); regulation era (1952–1986); deregulation era (1986–2004); consolidation era (2004–2005); and post-consolidation era (2006 to date).Over the last two decades Nigerian banking sector had experienced a number of major changes caused by restructuring and liberalization of the financial sector as well as technological progress (Odeleye, 2014). However, among the different phases mentioned the most significant is consolidation era. The aggregate loans and advances data of DMBs in Nigeria from deregulation era to date are illustrated figures below:

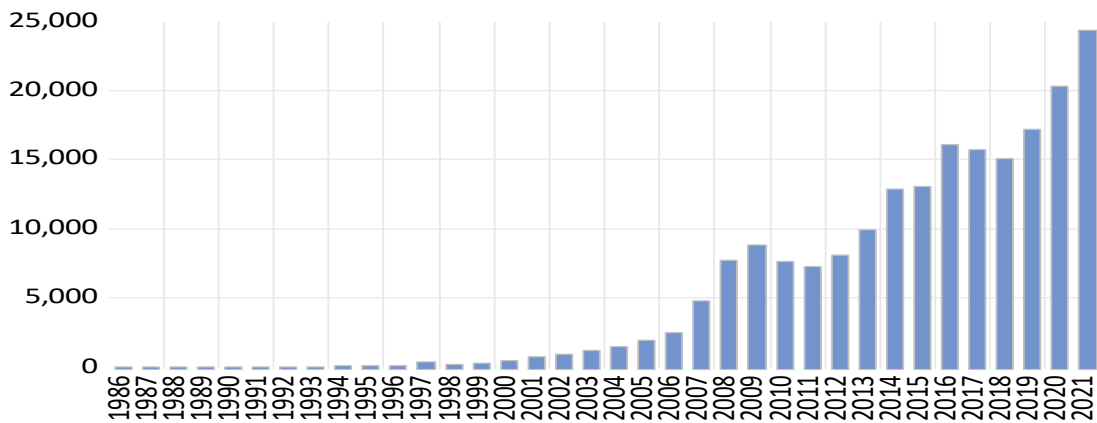Fig. 1: Aggregate loan and advances of DMB's in Nigeria, 1986-2021.
Source: Author's compilation from CBN Statistical Bulletin (2021).
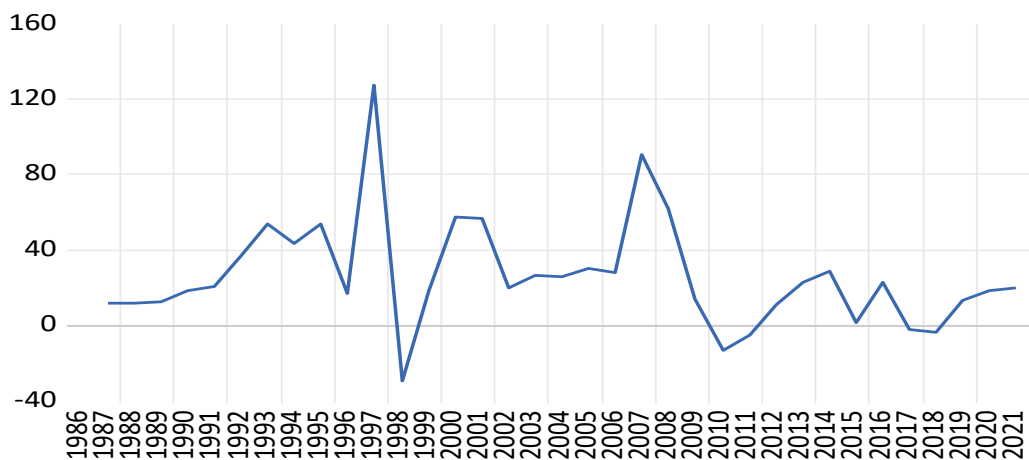

Fig. 2: Percentage change of aggregate loans and advances of DMB's in Nigeria, 1986-2021.
Source: Author's compilation from CBN Statistical Bulletin, 2021.

As shown in Figures 1 and 2 respectively. Aggregate DMBs credit to economic sectors has been increasing with significant % change on a year-on-year basis. At the end of 1986 the aggregate credit was 15.70billion and continued to increase year-on-year until 1998 when there was a negative fall of (-29.2%)from 385.55billion in 2017 to 272.90billion in 1998thus the trend continued to grow from then on. In 2004 the aggregate credit stood at 1,519.24billion and increased to 1,976.71billion in 2005 and 2,524.30billion in 2006 approximately (30.1%) and (27.7%) changes respectively. The trend subsequently witnessed significant growth in 2007(90.7%) and 2008(62%). The increase trend could be attributed to effect consolidation of banks which also raised the minimum capital base of banks to N25 billion. However, prior to the consolidation era, the minimum capital base of banks was N2 billion.

The aggregate credit kept increasing up to2009 when there was a fall in annual growth of aggregate credit of about (14.3%) with subsequent negative decrease in 2010 and 2011 approximately (-13.5%) and (-5.1%) changes respectively which reflecting the aftermath of the 2007–2008 financial crisis. The fever of the financial crisis triggered a global credit crunch so as bank credit contraction in Nigeria during 2009–2011.Nevertheless, without the earlier

proactive capital base requirement by monetary authority, the Nigerian banking industry would have experienced systemic risk during the 2007–2008 financial crisis with an earlier minimum capital requirement of N2 billion. Further, bank lending in Nigeria started increasing in 2012, after recovery from the financial crisis, and kept increasing up to 2016.Consequently, bank lending slightly decreased negatively in 2017 and 2008 with (-2.3%) and (-3.9%) changes respectively.

Empirical Review

A number of studies have examined the determinants of bank credit in different countries. Akindutire (2021) examined factors that determine the deposit money bank's lending behaviour to private sector of the economy in Nigeria using annual time series data spanning from 1986 to 2017. The study used secondary data sourced from CBN Statistical Bulletin while the estimation techniques used for the study were the Augmented Dickey-Fuller test, pairwise Granger causality test and autoregressive distributed lag (ARDL). The results showed that there was a significant relationship between bank lending behaviours and the identified determinants. Also, it was revealed that the variables move in the long run, though, among the variables of interest, the volume of deposit and M2G determines bank lending behaviour in the short and long run while RSR, INF and LDR retard lending to private sector. The study also found that causality runs from the volume of deposits to private sector credit.

The study of Oyebowale (2020) investigated the determinants of bank lending in Nigeria using annual data from 1961 to 2016. The study adopted the autoregressive distributed lag (ARDL), bounds testing approach and Granger causality tests to investigate the relationship and direction of causality among the variables. The study model examined the impact of growth in loan-to-deposit ratio, growth in inflation, growth in broad money, and growth in bank capital on growth in bank lending The Granger causality tests result showed that growth in broad money Granger-causes growth in bank lending, while there was no causality from other explanatory variables to bank lending in Nigeria. It was also revealed from the results that growth in bank lending Granger-causes growth in loan-to-deposit ratio and growth in inflation in Nigeria.

Bustamante et al. (2019) investigated the determinants of credit growth and the bank lending channel in Peru. The study used datasets from Peru's banking supervision agency on bank-specific variables (i.e. bank size, liquidity, capitalization, funding, revenue, and profitability) and employed regression analysis to estimate the variables. The results revealed that well-capitalized, high-liquidity, low-risk, more profitable banks tend to grant more credit, especially in domestic currency. Also, the study found evidence that reserve requirements both in domestic and foreign currency are effective in curbing domestic credit in Peru.

Adzis et al. (2018) assessed macroeconomic and bank-specific determinants of commercial banks' lending in Malaysia covering a period from 2005 to 2014. The study used a pool of data sourced from financial statements of 27 banks on total loans which is the dependent variable and total assets, liquid assets, bank deposit, non-performing loan, lending rate, reserve requirement, the annual growth rate of GDP, and the dummy for macro-prudential policy while panel regression was employed as the estimation technique. Findings show that bank size and volume of deposit influence commercial bank lending positively while liquidity influences the lending activities negatively in Malaysia. On the other hand, the study found no conclusive evidence to support the influence of gross domestic product (GDP), lending rate and cash reserve requirement on commercial bank lending activities in Malaysia

Akani and Oparaordu (2018) examined determinants of commercial banks credit to the domestic economy in Nigeria using time series data sourced from Central Bank of Nigeria Statistical bulletin The study employed ordinary least square properties of augmented Dickey Fuller test, co-integration test, and granger causality test and vector error correction model. Findings from the study revealed that banks specific variables shows that deposit liabilities and liquidity ratio have positive impact on total loans and advances while deposit rate, number of commercial banks branches and openness of the economy have negative impact. It was also found that (Macroeconomic variables) exchange rate, inflation rate and Real Gross Domestic Product have positive impact while public expenditure and openness of the economy have negative impact on total commercial bank loans and advances.

Similarly, Baoko et al. (2017) examined the relevant factors influencing allocation of bank credit to the private sector in the Ghanaian economy using annual time series data covering the period 1970 to 2011. The study employed Autoregressive Distributed Lag (ARDL) framework. The study found that broad money supply, bank assets, real lending rate, and bank deposits are significant determinants of bank credit in both the short and long-run. The results also revealed that Inflation exerts significant positive impact however only in the short-run. The findings further revealed that increases in deposits mobilization by banks does not necessarily translate into supply of credit to the private sector.

Ebere and Iorember (2016) examined the effect of commercial bank credit on the manufacturing sector output in Nigeria from 1980 to 2015 using Cochrane-Orcutt method. The study discovered that inflation rate and interest rate have negative effect on manufacturing sector output while loans and advances and broad money supply have positive effect with manufacturing sector output in Nigeria

Olanrewaju et al. (2015) empirically investigated the effect of banking sector reforms on the output of manufacturing sector in the Nigerian economy between 1970 and 2011 with a view to examining the extent of the impact of banking sector reforms on the manufacturing sector. The study utilized annual time series data from 1970 to 2011, adopting the Cointegration analysis and error correction mechanism (ECM). The result revealed that Bank assets, Lending rate, Exchange rate (EXR) and real interest rate have low and positively significant effect on manufacturing output while financial deepening and interest rate have negative and significant impact on the output growth of manufacturing sector in Nigeria

Akinlo and Oni (2015) examined the determinants of bank credit to the private sector in Nigeria using time series data covering a period from 1980 to 2010. The data were sourced from Central Bank of Nigeria Statistical bulletin and World Development Indicators. Credit to the private sector was used as the dependent variable while the explanatory variables are broad money supply, liquidity ratio, bank total asset, inflation rate, reserve ratio, cyclical risk premium, prime lending rate, exchange rate, minimum rediscount ratio and real gross domestic product. The results showed that broad money, cyclical risk premium and liquidity ratio tend to increase credit to the private sector. However, prime lending rate and reserve ratio lead to a decrease in credit to the private sector. It was also revealed from the results that private credit increases with inflation, but not one to one, meaning that inflation tends to diminish real bank credit to the private sector.

Ogar et al. (2014) examined how commercial bank credit can influence manufacturing sector in Nigeria using a time series data for a sample period of 1992-2011. The study utilized ordinary least squares multiple regression analysis and discovered that commercial bank credit

had a significant relationship on manufacturing sector in Nigeria. Also, Adolphus and Deborah (2014) analyzed the role of banks in financing the agriculture and manufacturing sectors in Nigeria from 1981 to 2010. The study employed descriptive statistics combined with multiple regression analysis. The findings revealed that there exists a significantly weak correlation between commercial bank lending and the contribution of agriculture to GDP and a significantly positive correlation between merchant bank lending and agricultural contribution to GDP.

METHODOLOGY

This study adopts causal research design. Time Series Annual data on DMBs financial data were extracted from statistical bulletin of CBN for the period 1986 – 2021. The study employed autoregressive distributed lag (ARDL) estimation technique to help estimate both the long and short run parameters of the model, while Augmented Dickey-Fuller (ADF) is used to test the stationarity of the variables.

Measurement of Research Variables

Variables	Definition	Measurement
DMBC	Deposit Money Banks Credit	Aggregate of total DMBs loan and advances to individuals, corporate bodies and governments from banking system. This includes credit to various economic sectors and subsector such as agricultural, Industrial, construction, trade/general commerce and government; services etc.
INF	Inflation Rate	This is general increase in prices and fall in the purchasing value of money.
LQD	Liquidity Ratio	Liquidity ratio is the ratio between the liquid asset and the liabilities of a bank or other institution.
LTD	Loan to Deposit Ratio	Loan-deposit ratio is a ratio between the banks total loans and total deposits. It is calculated by dividing bank's total amount of loans by the total amount of deposits for the same period.
PLR	Prime Lending Rate	This the rate of interest charged by a DMBs for lending money. It is the amount charged by lenders for a certain period as a percentage of the amount loaned

Model Specification

The study adopted a model from the empirical work of Akindutire (2021). The model stated as thus:

$$PSC_t = \beta_0 + \beta_1 VDt + \beta_2 LDR_t + \beta_3 RSR_t + \beta_4 M2G_t + \beta_5 INF + \mu_t$$

Where credit to the private sector (PSC) is the explained variable while the explanatory variables are volume of deposit (VD), lending rate (LDR), reserve requirement (RSR), money supply to GDP (M2G), Inflation rate (INF), and (μ) is the disturbance term . However, this modelwas adopted and adapted by incorporating regulation intervention that is, prime liquidity and loan to deposit ratio and by removing volume of deposit, reserve requirement and money supply to GDP (M2G).

The adapted model is stated thus in a functional form as:

DMBC = f (INF, LQD, LTD, PLR)……………………………………………………….... (1)

The estimable econometric model is formulated as:

$$DMBC_t = \beta_0 + \beta_1 INFt + \beta_2 LQD_t + \beta_3 LTD_t + \beta_4 PLR_t + \mu_t$$

Where:
DMBC = Deposit Money Banks' Credit
INF   = Inflation rate.
LQD   = Liquidity ratio
LTD   = Loan to deposit ratio
PLR   = Prime lending rate
t   = time period
$β_0$ = Constant Term.
$β_1$ - $β_4$ = Parameter to be estimated.
μ   = Error term

RESULTS AND DISCUSSION

Table 1: Descriptive Statistics

	DMBC	INF	LTD	LQD	PLR
Mean	5575.729	19.7383	65.97472	48.55694	18.33250
Median	1364.635	12.10000	66.06500	46.09000	17.77000
Maximum	24378.19	76.80000	96.82000	104.2000	29.80000
Minimum	15.70000	0.200000	37.56000	26.39000	10.50000
Std. Dev.	7007.423	18.19149	13.52366	14.99440	3.927990
Skewness	1.068278	1.798272	-0.047125	1.616740	0.772914
Kurtosis	2.975542	5.115482	2.699231	6.851673	4.323483
Jarque-Bera	6.848208	26.11560	0.149018	37.93617	6.211785
Probability	0.032578	0.000002	0.928199	0.000000	0.044785
Sum	200726.2	710.3100	2375.090	1748.050	659.9700
Sum Sq. Dev.	1.72E+09	11582.56	6401.131	7869.121	540.0187
Observation	36	36	36	36	36

Source: Author's computation (2022).

Results of descriptive statistics of the variables are highlighted in Table 1. It displayed overview of statistics such as the mean, median, standard deviation, and metrics of the distribution's symmetry and normality It is observed that the mean or average value of all the variables are positive. The standard deviation values are approximately 18.19, 13.52, 14.99 and 3.93 for inflation rate, loan to deposit ratio, liquidity ratio and prime lending rate respectively. It shows that among the independent variables inflation rate (INF) has the highest value for standard deviation. This implies that INF is the most volatile variable, it can change easily. While the standard deviation value of banks' credit to manufacturing sector (dependent variable) is 7007.423billion. This suggests that there is variation in banks credit allocation over the years.

All the variables are positively skewed except loan to deposit ratio (LTD) which is negatively skewed. In view of the kurtosis values, they are all positive. The kurtosis values are above 3indicating that all the variables except DMBC and LTD are platykurtic. Also, the probability value of the Jarque-Bera statistics for DMBC, INFL, LQD and PLR shows that the series of the variables follow a normal distribution with exception to LTD whose probability value is less than 5 percent level of significance

Table 2: Result of Augmented Dickey-Fuller Stationarity Test

Variable	ADF Sta	Critical Values		P-value	Order of Integration
DMBC	-5.083793	-4.284580	1%	0.0014	I(1)
		-3.562882	5%		
		-3.215267	10%		
INF	-5.609067	-3.639407	1%	0.0000	I(1)
		-2.951125	5%		
		-2.614300	10%		
LTD	-5.329910	-3.653730	1%	0.0001	I(0)
		-2.957110	5%		
		-2.617434	10%		
LQD	-3.213704	-3.632900	1%	0.0276	1(0)
		-2.948404	5%		
		-2.612874	10%		
PLR	-4.047168	-3.632900	1%	0.0034	I(0)
		-2.948404	5%		
		-2.612874	10%		

Source: Author's computation (2022).

The result of the unit root test using the Augmented Dickey-Fuller criterion is indicated in Table 2. Findings showed that banks' credit (DMBC) and Inflation Rate (INF) are stationary at the first difference while loan to deposit ratio (LTD), liquidity ratio (LQD) and prime lending rate (PLR) are stationary at level. As a result, there is clear evidence of mix integration thus the study adopts autoregressive distributed lag (ARDL) co integration since the variables of the study are combination of I(1) and I(0).

Autoregressive Distributed Lag (ARDL) Bound Test
In order to empirically estimate the long-run and short run dynamic relationship among the variables, the study employed the autoregressive distributed lag (ARDL) co integration method.

Table 3: ARDL Bound Cointegration Test

F-Bounds Test		Null Hypothesis: No levels relationship			
Test Statistic	Value	Signif.		I(0)	I(1)
			Asymptotic: n=1000		
F-statistic	5.565461	10%		2.2	3.09
k	4	5%		2.56	3.49
		2.5%		2.88	3.87
		1%		3.29	4.37
Actual Sample Size	32		Finite Sample: n=35		
		10%		2.46	3.46
		5%		2.947	4.088
		1%		4.093	5.532
			Finite Sample: n=30		
		10%		2.525	3.56
		5%		3.058	4.223
		1%		4.28	5.84

Source: Author's computation (2022).

The decision rule is if the calculated F-statistic is greater than the critical value for the upper bound I(1), then we conclude that there is cointegration. That is, there is presence of long term relationship. Thus we reject the null hypothesis and estimate the long run model which is ECM.

And If the calculated F-statistic is lower than the critical value for the lower bound I(0), then we conclude that there is no cointegration. Thus we fail to reject the null hypothesis and estimate the shortrun model which is ARDL model. However, if F-statistic fall between the lower bound I(0) and upper bound I(1), thus the test is considered inconclusive.

From the table above it is shown that the F-statistic value is greater than critical values in the upper bound I(1) and lower bound I(0) at all levels of significance for the asymptotic sample and when both the finite sample n is 35 and 30 respectively. Therefore, there is a strong evidence of long run relationship among banks' credit, inflation rate, loan to deposit ratio, liquidity ratio and prime lending rate in Nigeria. Thus, the study rejects the null hypothesis and estimates the long run model.

Short run and Long run Estimation (ARDL Error Correction Regression)
Since the variables are found cointegrated with the help of bound test, both short run and long run models are estimated as follow:

Table 4: Long Run Estimation

Levels Equation Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INF	45.67027	105.1192	0.434462	0.6694
LQD	-73.67156	138.6122	-0.531494	0.6020
LTD	-149.9686	107.0010	-1.401563	0.1790
PLR	431.3977	468.4203	0.920963	0.3700
C	1022.866	11604.30	0.088145	0.9308

EC = DMBC - (45.6703*INF -73.6716*LQD -149.9686*LTD + 431.3977*PLR + 1022.8661)

Source: Author's computation (2022).

The result show that the coefficient value of inflation rate, liquidity ratio, loan to deposit ratio and prime lending rate are approximately 45.67, -73.67, -149.96 and 431.39 with associated probability value of 0.6694, 0.6020, 0.1790 and 0.3700 respectively. In the long run INF has a positive and insignificant influence on bank credit to manufacturing sectors. This means that when inflation rate is increasing, in the long run it will have positive but insignificant effect on banks' credit. Also, LQD and LTD have negative and insignificant influence on banks' credit. That is, an increase in liquidity ratio and loan to deposit ratio will lead to insignificant decrease in banks' credit. Lastly, PLR has a positive but insignificant effect on banks' credit to economic sectors in the long run. The effect of inflation rate, loan to deposit ratio, liquidity ratio and prime lending rate on banks' credit seen in the long run is further tested in the short run below.

Table 5: Short Run Estimation
ARDL Error Correction Regression
Dependent Variable: D(DMBC)
Selected Model: ARDL(3, 4, 2, 1, 0)
Case 2: Restricted Constant and No Trend
Date: 08/18/22   Time: 15:06
Sample: 1986 2021
Included observations: 32

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DMBC(-1))	-0.441534	0.201406	-2.192253	0.0426
D(DMBC(-2))	-0.412344	0.162307	-2.540525	0.0211
D(INF)	17.99067	11.54355	1.558504	0.1375
D(INF(-1))	-14.48593	12.14032	-1.193208	0.2492
D(INF(-2))	16.96282	9.540175	1.778040	0.0933
D(INF(-3))	-24.91144	10.44815	-2.384292	0.0290
D(LQD)	-43.26004	11.07926	-3.904595	0.0011
D(LQD(-1))	-39.57399	12.59872	-3.141112	0.0060
D(LTD)	61.76673	13.64336	4.527238	0.0003
CointEq(-1)*	0.148898	0.022650	6.573748	0.0000

R-squared	0.760959	Mean dependent var		761.1306
Adjusted R-squared	0.663170	S.D. dependent var		1294.451
S.E. of regression	751.2618	Akaike info criterion		16.33169
Sum squared resid	12416674	Schwarz criterion		16.78973
Log likelihood	-251.3071	Hannan-Quinn criter.		16.48352
Durbin-Watson stat	2.204075			

Source: Author's computation (2022).

In the above table the short run dynamics result is presented. Inflation rate has a positive and insignificant effect on banks' credit in the short run as seen in the long run estimation, whereas LQD has a negative but significant effect on banks credit in the short run. LTD has a positive and significant effect on banks' credit in the short run. The CoinEq(-1)* which means error correction coefficient is positive and p-value is less than 0.05, which means there is presence of short run causality. The coefficient represents speed of adjustment of any equilibrium towards long run equilibrium state. Here the speed of adjustment is 0.14*100 = 14%. Also the R-squared statistic indicates that the explanatory variables in the model (INFL, LQD, LTD) accounted for approximately 76% of the deviation in the dependent variable (DMBC).

Post Estimation/Diagnostic Tests
Table 6: Wald Coefficient Test
Wald Test:
Equation: Untitled

Test Statistic	Value	df	Probability
F-statistic	257.8902	(15, 17)	0.0000
Chi-square	3868.353	15	0.0000

Source: Author's computation, (2022).

This test was conducted to identify whether independent variables influence the dependent variable at short-run. The result in the model shows that the p-value of the Chi-square statistics is less than the alpha value at 5%. So, the null hypothesis of no short-run dynamic influence from independent variables (INF, LQD, LTD, PLR) to dependent variable (DMBC) is rejected. Therefore, the study concludes that there is presence of short-run causality from the independent variables to dependent variable.

Table 7 Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	2.399962	Prob. F(2,15)	0.1247
Obs*R-squared	7.757484	Prob. Chi-Square(2)	0.0207

Source: Author's computation (2022).

The Breusch-Godfrey Serial Correlation LM test result shows that p-value is less than 0.05 critical level of significance. Thus, the null hypothesis is rejected which means that residuals are serially correlated.

Table 8: Heteroskedasticity Test: Breusch-Pagan-Godfrey

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.665960	Prob. F(14,17)	0.7762
Obs*R-squared	11.33400	Prob. Chi-Square(14)	0.6596
Scaled explained SS	2.250292	Prob. Chi-Square(14)	0.9998

Source: Author's computation (2022).

The test reported p-value of 0.6596 which is higher than the critical level of significance at 0.05. Thus, the study fails to reject the null hypothesis which means there is no arch effect in the model and that residuals are homoscedastic.

Figure 3: Cusum Test: Stability Diagnostic
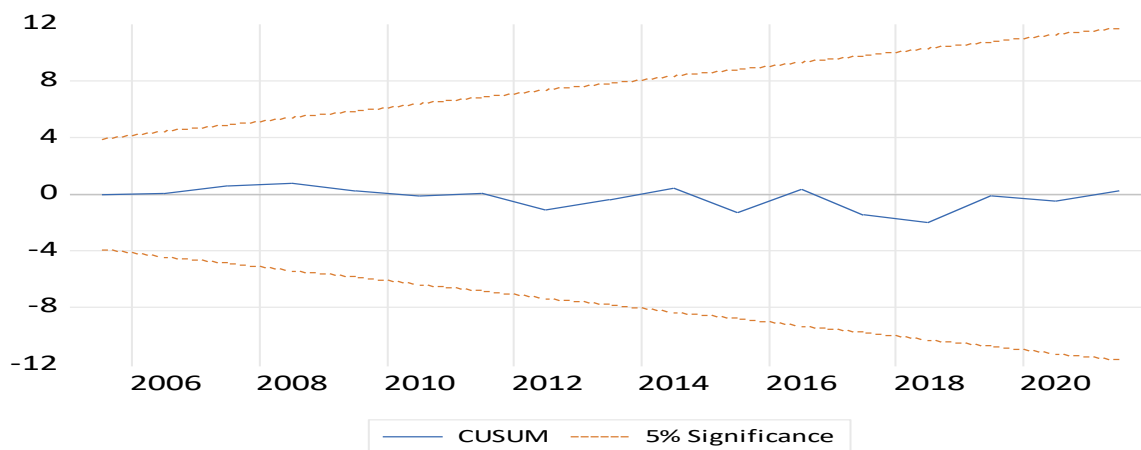
Source: Author's compilation (2022).

From the figure above, the cumulative sum (CUSUM) of residuals lies completely in-between the two 5 percent significant transverse lines. This implies that there is long run relationship and the parameters of the specification for this study are time invariant and stable during the sample period.

DISCUSSION OF FINDINGS

Findings indicated that both in the long and short run, inflation rate affect banks' lending to the manufacturing sector positively but marginally. This goes against the a priori assumption that INF is expected to result in reduced banks' credit. This outcome supports the findings of Ajayi and Atanda (2012), Ebire and Ogunyinka (2018) that INF has positive but minimal effect on bank lending. Additionally, Akinlo and Oni (2015) asserted that private credit rises with INF.

However, the outcome is in contrast to Sharma and Gounder (2012) in which INF is negatively correlated with banks' credit; and that the demand for credit will likely decline as living standards and borrowing costs rise, and that INF could be harmful to credit supply. In Pakistan, Guo and Stepanyan's (2011) and Imran's (2011) also support this finding.

Additionally, the effect of LQD on bank loans was examined. It was discovered that while LQD negatively and insignificantly affects bank credit over the long term, it negatively and significantly affects bank credit over the short term. This result confirms the a priori assumption that increased LQD results in declining bank credit to manufacturing sectors. This is based on the observation that banks' capacity to create credit tends to be constrained by excessive liquidity. The outcome, however, is in contrast to Akinlo and Oni's (2005) discovery that LQD significantly boosts credit supply. Additionally, Akani and Oparaordu's (2018) found that LQD has a favorable effect on the amount of loans and advances. However, given that Nigerian banks have extra reserves due to the country's significant oil wealth, monetary policy measures like LQD may not negatively affect credit supply in the nation.

More so, the effect of loan to deposit ratio was examined. Findings revealed that in the long term LTD negatively and insignificantly affected banks' credit to manufacturing sectors. However, it has a favourable and substantial effect in the short run. This result is in line with *a priori* expectation that LTD is expected to enhance banks 'credit to the manufacturing sectors in the short run. Also, the nature of the relationship suggests that when bank deposits rise, bank lending follows, increasing the LTD. This outcome is in line with Oyebowale (2020) that a substantial positive link exist between growth in loan to deposit ratio and growth in loan and advance though in the long run. The result differs from the study of Uyagu and Osuagwu (2015) that LTD negatively but significantly affect bank lending in Nigeria.

Lastly, the study examined the effect of prime lending rate on banks' credit to manufacturing sectors in Nigeria. It was found that PLR has a positive but insignificant effect on banks' credit in the long run. Moreover, PLR did not show any effect on banks' credit in the short run. This result is in line with the *a priori* expectation that PLR is expected to increase banks' credit to manufacturing sector however, in the short run, result was not significant. The reason may be that, as lending rates increase banks release huge volumes of loanable funds in anticipation of higher earnings through interest on loans. This outcome is consistent with Assefa (2014) who found a positive nexus between bank credit and lending rate. However, the result contradicts the findings of Enisan and Oluwafemi (2015) and Ayieyo (2016) as they found that the lending rate reduces the amount of credit to sectors of economy.

CONCLUSION AND RECOMMENDATION

The study concluded that independent variables (INF, LQD, LTD and PLR) do not significantly affect banks credit allocation to manufacturing sector in the long run. All the variables demonstrated negative effect on DMBs credit except inflation rate which was positive. On the other hand, in the short run, LQD though negative, portend significant effect on DMBs credit and LTD positively and significantly affect banks' credit respectively. Moreover, INF exhibited positive but insignificant effect on banks' credit; however, PLR have no effect on banks' credit to manufacturing sector.

Summarily, banks' credit to manufacturing sectors increases with INF and LTD. However, LQD reduces banks' credit to manufacturing sector in Nigeria. More so, CoinEq (-1)* which means error correction coefficient is positive and p-value is less than 0.05, which means there is presence of short run causality. It is recommended that there should be consultation between

regulatory authorities and DMBs so that the effect of regulatory measure on banks will be taken into consideration at the stage of policy formulation and implementation.

CONTRIBUTION TO KNOWLEDGE

The research significantly added to existing body of knowledge by incorporating variables such as prime lending rate and loan to deposit ratio as factors responsible for credit allocation of DMBs to manufacturing sectors in Nigeria. Also unlike past studies, this study covers a longer period (1986 – 2021).The timeframe was extended to 2021 in order to determine the current trend on credit allocation to manufacturing sectors in Nigeria.

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