DETERMINANTS OF DEPOSIT MONEY BANKS' CREDIT TO MANUFACTURING SECTOR IN NIGERIA

Abimbola Oluwaseyi ADEMOLA
Department of Banking and Finance, Osun State University,
Osogbo, Osun State, Nigeria
E-mail:

Abstract: *The study investigated the determinants of Deposit Money Banks (DMBs) credit to manufacturing sector in Nigeria. Specifically, the effect of macroeconomic factors proxied by inflation rate (INF), liquidity ratio (LQD), loan to deposit ratio (LTD) and prime lending rate (PLR) on DMBs'credit was evaluated. Annual data on selected DMBs were taken from the CBN statistical bulletin from 1986 – 2021.Augmented Dickey-Fuller test (ADF) and Autoregressive Distributed Lag (ARDL) estimation techniques were employed. Results 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 LQD 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, LTD, LQR and PLR are critical factors that influence DMBs'credit to manufacturing sectors. Therefore, the study recommends that Central Bank of Nigeria should implement favorable monetary and macroeconomic policies so as to facilitate banks' lending to Nigerian manufacturing firms thereby enhancing economic growth.*

Keywords: Banks' credit, determinants, economic growth, financial intermediation.
JEL Classification: E2, E5, G2.

1. Introduction

The growth of the Nigerian economy is substantially driven by the manufacturing sector. The sector is in charge of turning raw materials into final products. In addition to diversifying the economy and generating jobs, it also helps the country's foreign exchange profits. According to Gbadebo et al. (2017), the sector serves as a catalyst that quickens the structural transformation and economic diversification process, allowing a nation to fully exploit its factor endowment for sustainable economic growth. In addition, the manufacturing sector dominates and has surpassed the service sector in a number of Organization for Economic Co-operation and Development (OECD) countries in terms of its contribution to the Gross Domestic Product (GDP) (Anyanwu, 2010).

Regrettably, Nigeria has been a pitiful case despite having tremendous natural resources as the manufacturing sector still makes up a relatively small portion of the country's GDP. Additionally, government's attempts to promote industrialization through raising the output of manufacturing companies have failed. Even as the country strives to become a global economic leader, this is cause for concern (Omankhanlen and Owonibi, 2012). According to Omankhanlen and Owonibi (2012), this industry faces a wide range of difficulties, including weak capital mix, inadequate lending opportunities, budget deficits, and macroeconomic instability. However, the author stressed that despite the sector being designated as a priority sector by the monetary authorities, it faces significant difficulties due to suffocatingly high interest rates and banks' reluctance to lend to it. Nigerian manufacturing firms are still experiencing declining growth, according to Abubakar & Gani (2013), since it is difficult to get financial resources, particularly from the banks, who control roughly 90% of the financial sector's assets and focus their loans on the oil and gas sectors

This demonstrated how important Deposit Money Banks' (DMBs') credits are to the manufacturing sector's efficient performance. Its accessibility is essential for fostering economic growth, particularly in developing and emerging markets (Imran & Nishat, 2013). The performance of manufacturing sector has greatly improved as a result of accessibility to DMBs credits, which also help banks meet their performance goals (Casolaro et al, 2002).

Unfortunately, despite ongoing policy strategy to attract credits to the manufacturing sector, the Nigerian manufacturing companies have proven to be unappealing for DMBs credits at low lending rates (Ogar, Nkamare, & Effiong 2014). As the central bank of Nigeria (CBN report, 2009) noted, commercial bank loans and advances to the manufacturing sector practically continuously departed from required minima during the regulatory regime. In addition, bank lending marginally declined in 2017 and 2018, with movements of (-2.3%) and (-3.9%), respectively (CBN, 2021).

Observing the trend of DMBs credit to the manufacturing sector shows that DMBs willingness to provide credit to the manufacturing sevctor is contingent upon several factors.These factors are thought to be crucial in the industrialization process, as such governments over the years have attempted to mitigate the adverse business climate that is currently prevalent in the manufacturing sector. It is believed that investing in the manufacturing sector to boost industrial capacity and technological innovation is the quickest way for transition from having a primarily traditional industry to a contemporary manufacturing sector. Therefore, the purpose of this study is to investigate the factors that influence DMBs' lending to Nigeria's manufacturing sector.

Research Hypotheses

The study hypotheses were stated in null form.

Ho_1:   Inflation rates have no effect on DMBs credit to manufacturing sector in Nigeria.

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

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

Ho_4:   Prime lending rates have no significant effect on DMBs credit to manufacturing sector in Nigeria.

2.   Literature Review
2.1   Conceptual Review
#### 2.1.1   Banks' Credit

The term banks' credit refers to the amount of money made accessible to an individual, business or corporate borrower from a banks as loans and advances. In other words, it is the total amount of money made accessible to a group of businesses in the same or different sectors of an economy from a bank in order to accelerate economic growth.CBN (2003) defines bank credit as the sum of loans and advances given by the banks to different economic players. Similarly, Nigerian Deposit Insurance Corporation (NDIC) Prudential Guidelines (1990) describes bank credit as the sum of all loans, advances, guarantee, overdraft, lease, commercial papers, bills discounted and banker acceptance. Credit from banks can either be short, medium or long-term . While working capital can be financed by short-term credit, long and medium term credit are mostly utilized to finance long-term investments for productive purposes (Akindutire, 2021). Ndifong and Ubana (2014) explained that DMBs being a generic name for commercial and merchant banks operating in the nation since the start of universal banking in 2001 hence DMBs credit is the borrowing capacity of these universal banks to offer loans to individual, government, or organization. Nwanyanwu (2010) asserted that credit is money that a lender lends to a borrower. Credits and banks are interdependent financial twins.

Therefore, banks serve as a conduit for money from surplus parts of the economy to economically deficient ones that offer profitable investments. Credit allocation was described by Agbanike et al. (2016) as the conduit via which resources are allocated for financially sound investment activities that increase the production of several high-priority economic sectors.

#### 2.1.2   Trend of Banks' Credit in Nigeria

Banking sector in Nigeria has undergone several eras 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 sectorhad experienced a number of major changescaused by restructuring and liberalisation 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 Nigerian DMBs from deregulation era to date are illustrated figures below.

Fig 1
Aggregate Loans and Advances of
DMBs in Nigeria, 1986 − 2021 (#'B).
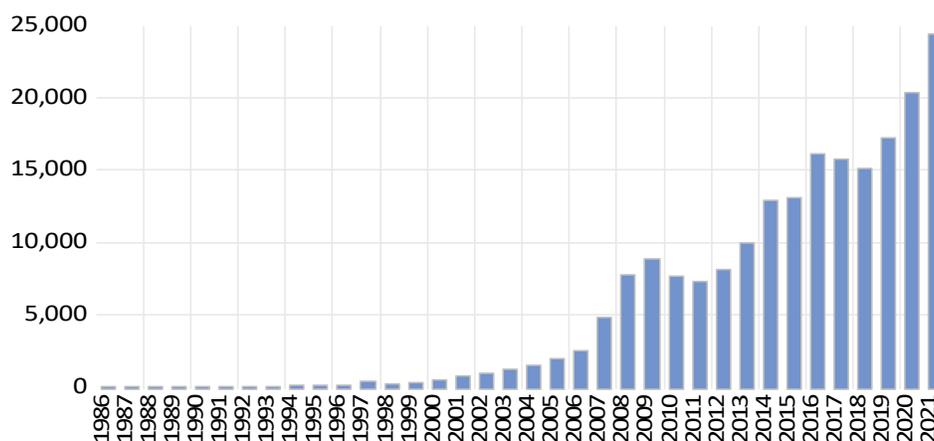
Source: *Author's compilation from CBN Statistical Bulletin, 2021.*

Fig 2.
% Change (Annual Rate) of Aggregate Loans and Advances of
DMBs in Nigeria, 1986 − 2021.
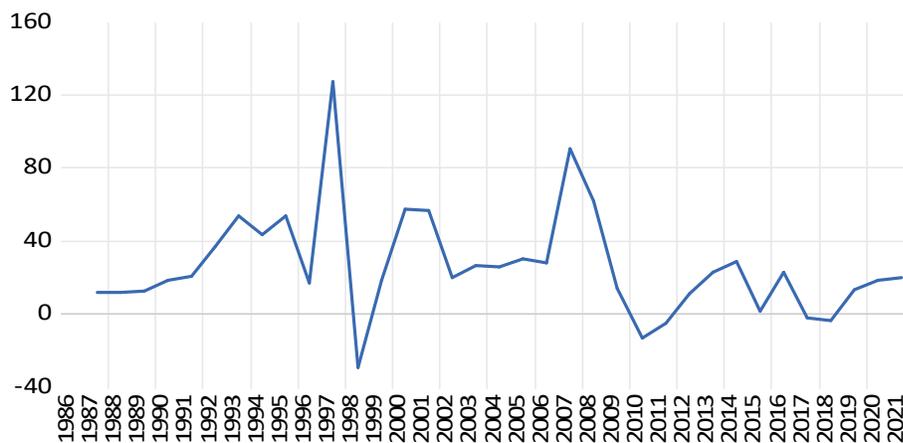
Source: *Author's compilation from CBN Statistical Bulletin, 2021.*

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 of banks consolidation which raised the minimum capital base of banks to N25 billion. However, the minimum capital requirements for banks was N2 billion before the era of consolidation.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 intensity of the financial meltdown triggered a worldwide credit crunch and the contraction of bank lending in Nigeria between 2009. Nevertheless, the Nigerian banking sector would have faced systemic risk during the 2007–2008 financial crisis, but for the earlier preemptive capital base requirement by the monetary authority.Furthermore, following the financial crisis' recovery, bank lending in Nigeria began to rise in 2012 and continued to do so through 2016. As a result, bank lending had minor negative declines in 2017 and 2008, with movements of (-2.3%) and (-3.9%) correspondingly.

2.2. Theoretical Review
The Bank Lending Channel Theory

The key work of Bernanke and Blinder (1988), which relies on the research of Tobin (1969) and Brunner and Meltzer, was an earlier proponent of the bank lending channel (1972). The hypothesis postulates that changes in monetary policy will influence the availability of intermediate loans, namely loans provided by DMBs. According to the theory, changes in monetary policy will have an impact on the loans that banks can offer (i.e., their liabilities), which would then have an impact on the total number of loans they can make (i.e. assets of the banks).

According to Bernanke and Blinder's (1988) model, there are three requirements that must be met in order for a distinct bank lending channel of monetary policy transmission to exist. These requirements are (i) monetary authorities should be able to affect the supply of intermediated loans by changing the amount of reserves in the banking system; (ii) open-market bonds and intermediated loans must not be perfect substitutes; and (iii) there must be imperfect price adjustment that inhibits the neutrality of any monetary policy shock.

According to Grodzicki et al. (2000), the existence of a bank lending channel is predicated on two key tenets: monetary policy decisions have an impact on banks' liquidity positions, and changes in the supply of bank loans have an impact on borrowers because they have limited access to alternative sources of funding. Oyebowale (2020) also proposed that monetary authorities implement monetary policies inside an economy through the bank lending channel. As an illustration, an expansionary monetary policy through the bank lending channel enhances bank deposits and reserves, result in a rise in the supply of bank loans, which in turn increases the availability of bank loans to boost investment and consumer spending.

2.3 Empirical Review

Akindutire (2021) investigated factors that affect DMBs lending behaviour to private sector of Nigerian economy 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 and autoregressive distributed lag (ARDL). Findings demonstrated a substantial correlation between bank lending practices and the determined factors. Additionally, it was discovered that factors do indeed change over time. However, among the relevant variables, deposit volume and M2G impact bank lending behavior both immediately and over time, whereas RSR, INF, and LDR slow down lending to the private sector

The study of Oyebowale (2020) evaluated the factors influencing bank lending in Nigeria using annual data from 1961 to 2016. The study adopted autoregressive distributed lag (ARDL), bounds testing approach and Granger causality tests. The study model looked at how changes in the loan-to-deposit ratio, inflation, broad money, and bank capital affected changes in bank lending. The results of the Granger causality tests indicated that, in contrast to other explanatory variables, there was no causal relationship between growth in bank lending and broad money growth in Nigeria. The findings also showed that rising bank lending Granger-causes rising loan-to-deposit ratio and rising inflation in Nigeria.

Bustamante et al. (2019) looked into the factors that influence credit growth and the banks' role in lending in Peru..

Bustamante *et al.* (2019) looked into factors influencing credit growth and the bank lending channel in Peru. Regression analysis was utilized to estimate bank-specific variables, which included bank size, liquidity, capitalization, funding, revenue, and profitability. Findings showed that banks with better capitalization, higher liquidity, lower risk, and higher profits tended to extend more credit, particularly in local currencies. The study also discovered proof that reserve restrictions, both in local and foreign currency, are successful in reducing Peru's domestic.

Adzis et al. (2018) evaluated macroeconomic and bank-specific factors influencing lending by commercial banks in Malaysia from 2005 to 2014. The estimating method used was panel regression. Findings indicate that while liquidity has a negative impact on lending activities in Malaysia, bank size and deposit volume have a favorable impact on commercial bank lending. However, the study did not find strong evidence to support the idea that Malaysia's gross domestic product (GDP), lending rate, or cash reserve requirement have any impact on the country's commercial bank lending activities.

Akani and Oparaordu (2018) used time series data from the Central Bank of Nigeria Statistical Bulletin to study the factors that determine commercial banks' lending to the country's domestic economy. The study used the Augumented Dickey Fuller test, co-integration test, ordinary least square test, and Granger causality test. The results showed that while deposit rates, the number of commercial bank branches, and the openness of the economy have negative effects on total loans and advances, deposit liabilities, and the liquidity ratio have favorable effects. Additionally, it was discovered that while governmental spending and the economy's openness have a negative impact on total commercial bank loans and advances, the exchange rate, inflation rate, and real gross domestic product had a favorable impact.

Similar to this, Baoko et al. (2017) used annual time series data spanning the years 1970 to 2011 to investigate the variables impacting bank credit allocation to the private sector in the Ghanaian economy. The Autoregressive Distributed Lag (ARDL) framework was used in the investigation. The study discovered that the broad money supply, bank assets, real lending rate, and bank deposits are important short- and long-term determinants of bank

credit. The findings also showed that inflation had a notable, positive effect, but only in the near term. The results also showed that rising bank deposit mobilization does not always result into increased private sector loan availability.

Using the Cochrane-Orcutt technique, Ebere and Iorember (2016) investigated the impact of commercial bank loan on Nigeria's manufacturing sector output from 1980 to 2015. According to the study, Nigeria's manufacturing sector output is positively impacted by loans, advances, and a large money supply, while the country's inflation rate and interest rate are negatively impacted.

Olanrewaju et al. (2015) used the Cointegration analysis and error correction model to examine the impact of banking sector reforms on the manufacturing sector's production in the Nigerian economy between 1970 and 2011. (ECM). The results showed that whereas financial deepening and interest rates had negative and insignificant effects on manufacturing production, bank assets, lending rates, exchange rates (EXR), and real interest rates had strong and positive effects on manufacturing output

Akinlo and Oni (2015) used time series data spanning the years 1980 to 2010 to explore the factors influencing bank loans to the private sector in Nigeria. The findings demonstrated that credit to the private sector is generally increased by broad money, cyclical risk premium, and liquidity ratio. 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 appear to reduce bank credit to the private sector.

Ogar et al. (2014) used time series data for a sample period of 1992–2011 to assess how commercial bank lending can affect Nigeria's manufacturing sector. The study used ordinary least square regression analysis and found that the manufacturing sector in Nigeria was significantly impacted by commercial bank loans. From 1981 to 2010, banks' contributions to Nigeria's manufacturing and agricultural sectors' funding were examined by Adolphus and Deborah (2014). Multiple regression analysis was utilized with descriptive statistics in the study. The results showed that there is a considerably negative association between merchant bank lending and agricultural contribution to GDP and a very weak correlation between commercial bank lending and the contribution of agriculture to GDP.

2.4. Gap in the Literature

In Nigeria, only few studies incorporated variables such as prime lending rate and loan to deposit ratio as factors responsible for credit behavior of DMBs to manufacturing sectors in Nigeria. As a result of this, there is a gap, thus necessitating further research effort on these factors. Also unlike past studies, this study covers a longer period (1986 – 2021) in order to examine the factors that influence banks' credit allocation to manufacturing sectors in Nigeria.

3. Research Methodology

Causal research design is used in this study Annual data on selected DMBs were taken from the CBN statistical bulletin from 1986 –2021 . In order to estimate the model's long and short-run parameters, the study used autoregressive distributed lag (ARDL) technique, while Augmented Dickey-Fuller (ADF) is used to assess the stationarity of the variables..

3.1. 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.
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	It is the ratio between a bank's total loans and its total deposit
PLR	Prime Lending Rate	This the rate of interest charged by DMBs for lending money.

3.2. Model Specification

The study used a model from Akindutire (2021). The model read as follows:

PSCt = 0 + 1 VDt + 2 LDRt + 3 Rsr + 4 M2Gt + 5 Inf + t

In this scenario, the explained variable is credit to the private sector (PSC), while the explanatory variables are deposit volume (VD), lending rate (LDR), reserve requirement (RSR), money supply to GDP (M2G), inflation rate (INF), and disturbance term (). However, this model was adopted and modified by adding regulation intervention, namely, prime liquidity and loan to deposit ratio, and by deleting deposit volume, reserve requirement, and money supply to GDP (M2G).

Thus, the modified model is expressed in functional form as

The study used a model from the work of Akindutire (2021). The model is 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 independent 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

4. 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

The descriptive analysis are highlighted in Table 1. It displayed the mean, median, standard deviation, and metrics of the distribution's symmetry and normality It is observed that the mean values are all positive. Standard deviation values are approximately 18.19, 13.52, 14.99 and 3.93 for INF,LTD, LQR and PLR 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.

Skewness is positive for all the variables except LTD. All the variables demonstrate positive kurtosis values. All the variables except DMBC and LTD are platykurtic. Also, the probability values of the Jarque-Bera for DMBC, INFL, LQD and PLR shows that the series of the variables is normally distributed with exception to LTD whose value is lower than 5% significance level.

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 unit root test using the Augmented Dickey-Fuller criterion is presented in Table 2. Findings showed that DMBC and INF are stationary at first difference while LTD, LQR and PLR are stationary at level. As a result, there is clear evidence of mix integration thus the study adopted ARDL co- integration since tested variables are combination of I(1) and I(0).

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

It can be seen from table 3 that F-statistic value is higher than critical values in the upper bound I(1) and lower bound I(0) at all levels of significance that for the asymptotic sample and when both the finite sample n is 35 and 30 respectively.

As a result, there is compelling evidence that in Nigeria, the prime lending rate, the rate of inflation, the loan to deposit ratio, and the loan to liquidity ratio are all related over the long term. In this way, the research disproves the null hypothesis and calculates the long-term model.

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

From Table 4, findings show that INF and PLR have favourable but insignificant influence on banks credit to manufacturing sectors. This means that when inflation rate and PLR are increasing, in the long run they 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 LQD and LTD will lead to marginal reduction in banks' credit.

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

The short run dynamics is presented in Table 5. R-squared statistics indicate that the tested variables account for 76% of the variation in the model Inflation rate has a positive and insignificant effect on banks' credit in the short run, whereas LQD negatively but significantly affect banks credit. LTD positively and significantly affect banks' credit in the short term. The CoinEq(-1)*, the error correction coefficient is positive and p-value is less than 0.05, which signifies 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%..

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

Diagnostic test was carried out in Table 6 to investigate the influence of the independent variables on the dependent variables in the short-term. Findings indicate 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 shortrun causality.

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 in Table 7 shows that p-value is less than 0.05 significance level. Thus, we reject the null hypothesis indicating 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 Heteroskedasticity test as presented in Table 8 indicated that p-value is 0.6596 which is higher than the critical level of significance at 0.05. Thus, the null hypothesis is accepted signifying that no arch effect exist in the model and that residuals are homoscedastic.

Figure 3: Cusum Test: Stability Diagnostic
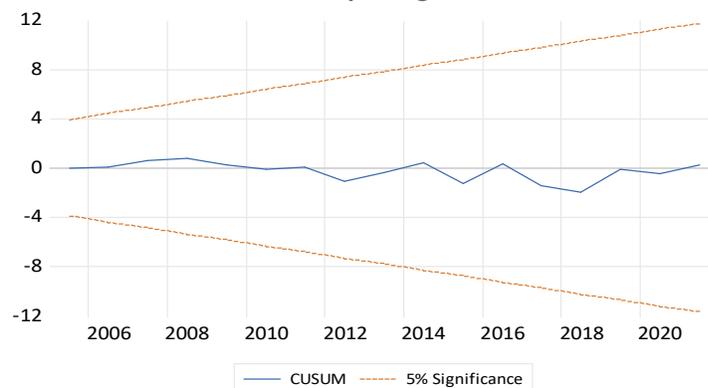
Source: Author's compilation, 2022

The parameter stability test was conducted in order to verify if the specification for the study are correctly specified or not. From the figure above, the cumulative sum (CUSUM) of residuals lies completely in-between the two 5 percent significant transverse lines. This signifies long-term relationship and selected parameters are stable during the sample period.

5. 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 & Atanda, 2012; Ebire & 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.

The study also looked at how the prime lending rate affected Nigerian banks' lending to the manufacturing sector. It was discovered that PLR had a long-term, beneficial but negligible impact on banks' credit. Additionally, PLR did not have any impact on banks' short-term credit. This outcome is consistent with the a priori hypothesis that PLR will lead to an increase in bank lending to the manufacturing sector; nevertheless, the result was not substantial in the short term. The cause could be that banks release massive amounts of loanable funds as lending rates rise in anticipation of larger returns from interest on loans. This result is in line with Assefa's (2014) finding that there is a positive relationship between bank credit and lending rate. Though, the result contradicts the findings of Enisan and Oluwafemi(2015) and Ayieyo (2016) that lending rate decreases the quantity of credit available to manufacturing sectors.

6. 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.

Suggestion for further studies

Further studies should be carried out on factors affecting banks credit to agricultural sector in Nigeria.

References

1. Abdul Adzis, A., Sheng, L.E. and Abu Bakar, J., 2018. Bank lending determinants: Evidence from Malaysia commercial banks. *Journal of Banking and Finance Management*, *1*(3), pp. 36-48.
2. Adenugba, A.A., 2015. Banking system credit as an instrument of economic growth in Nigeria (1983-2012). *European Journal of Business, Economics and Accountancy*, *3*(7), pp. 1-23.
3. Adolphus, J.T., Deborah, B.P., 2014. Analysis of the role of banks in financing the agriculture and manufacturing sectors in Nigeria. *International Journal of Research in Business Management*, 2(2), pp. 9-22
4. Agbanike, T.F., Onwuka, K.O. and Eyoghasim, M., 2016. Bank lending and output growth in Nigeria. *Journal of Economics and Sustainable Development*, *7*(7), pp. 30-37.
5. Akani, H.W. and Oparaordu, B., 2018. Determinants of commercial banks credit to the domestic economy in Nigeria: Examinations of dynamics principles. *Indian Journal of Finance and Banking*, *2*(2), pp. 26-41.
6. Akindutire, T., 2021. Determinants of deposit money banks lending behaviour to private sector of the economy in Nigeria (1986-2017). *Management & Economics Research Journal*, *3*(1), pp. 76-94.
7. Akinlo, A.E. and Oni, I.O., 2015. Determinants of bank credit growth in Nigeria 1980-2010. *European Journal of sustainable development*, *4*(1), pp. 23-23.
8. *Akintola B.O., 2004. The Nigerian stock market: Behaviour and performance. Arbitrage Studies in the Capital Market, Lagos: Arbitrage Consulting.*

9. Alkhazaleh, A.M.K., 2017. Factors may drive the commercial banks lending: evidence from Jordan. *Banks and Bank Systems*, *12*(2), 31.
10. Asuquo, B. and Selem-Amachree, I., 2021. Sector-specific credit allocation by deposit money banks and real sector development in Nigeria. *African Journal of Business and Economic development.*
11. Ayodeji, E.A. and Ajala, R.B., 2018. Capital market performance and economic growth in Nigeria (1984-2016). *Journal of Advances in Social Science and Humanities, 4* (11), pp. 362-378.
12. Ayieyo, J.O., 2016. Determinants of lending behavior in selected commercial banks in Kenya. *International Journal of Economics, Commerce and Management*, *14*(9), pp. 767-782.
13. Baoko, G., Acheampong, I.A. and Ibrahim, M., 2017. Determinants of bank credit in Ghana: A bounds-testing cointegration approach. *African Review of Economics and Finance*, *9*(1),pp. 33-61.
14. Bernanke, B. and Blinder, A., 1988. Credit, money and aggregate demand. *American Economic Review, 78*(2), pp. 435–439.
15. Brunner, K. and Meltzer, A., 1972. Money, debt and economic activity. *Journal of Political Economy, 80*(5), pp. 951–977.
16. Bustamante, J., Cuba, W. and Nivin, R., 2019. Determinants of credit growth and the bank-lending channel in Peru: A loan level analysis.
17. Central Bank of Nigeria, 2003. *CBN Briefs:* Research Department. Nigeria.
18. Central Bank of Nigeria, 2009. *CBN Briefs*, 2008-2009 Edition, Research Department, CBN: Abuja.
19. Chodecal, D., 2004. Impact of lending policy on banking industry in Nigeria. *Journal*, 7(4), pp. 12-22.
20. Ebire, K. and Ogunyinka, S., 2018. Bank lending channel of monetary policy transmission mechanism in Nigeria. *IIARD International Journal of Banking and Finance Research, 4*(2), pp. 51–64.
21. Ebere, E.J. and Iorember, P.T., 2016. Commercial bank credit and manufacturing sector output in Nigeria. Journal of Economics and Sustainable Development, 7(16), pp. 189-196.
22. Gertler, M. and Gilchrist, S., 1994. Monetary policy, business cycles and the behaviour of small manufacturing firms. *The Quarterly Journal of Economics, 109*(2), pp. 309–340.
23. Gertler, M. and Gilchrist, S., 1994. Monetary policy, business cycles, and the behavior of small manufacturing firms. *The Quarterly Journal of Economics*, *109*(2), pp. 309-340.
24. Grodzicki, M., Halaj, G. and Zochowski, D., 2000. *Commercial bank lending policy and loan supply*. Financial System Department, National Bank of Poland.
25. Grodzicki, M., Halaj, G. and Zochowski, D., 2009. Commercial bank lending policy and loan supply. *Journal of Economic Literature*.
26. Imran, K. and Nishat, M., 2013. Determinants of bank credit in Pakistan: A supply side approach. *Economic Modeling*, *35*, pp. 384-390.
27. Levine, R., 2005. Finance and growth: Theory and evidence. In P. Aghion and S. Durlauf (Eds.) *Handbook of economic growth*, pp. 865-943. Elsevier.
28. Luper, I., 2012. Banking sector reforms and SMEs financing in Nigeria. *Global Journal of Management Science and Technology, 1*(3), pp. 5–12.

29. Mishkin, F., 1996. The channels of monetary transmission: Lessons for monetary policy. *Banque de France-Universite Conference.* National Bureau of Economic Research.
30. Ndifong, O.E. and Ubana, U.I., 2014. The impact of capital adequacy on deposit money banks' profitability in Nigeria. *Research Journal of Finance and Accounting*, 5(12), pp. 7 – 15.
31. Nwanyanwu, O.J., 2010. An analysis of bank credit on the Nigeria economic growth (1992 – 2008). *Journal of Economics,* 4, pp. 43 – 58.
32. Obamuyi, T., 2010. Firms' performance and lending constraints in Nigeria. *The Journal of Entrepreneurship, 19*(2), pp. 179–190.
33. Odeleye, A.T., 2014. Pre-consolidation and post-consolidation of Nigerian banking sector: A dynamic comparison. *International journal of economics and financial issues, 4*(1), pp. 27-34.
34. Ogar, A., Nkamere, S.E., Effiong, C., 2014. Commercial bank credit and its contributions on manufacturing sector in Nigeria. European Scientific Journal, 8(3), pp. 19-36.
35. Ohlin, B., 1937. Some notes on the Stockholm theory of savings and investment. *The Economic Journal*, *47*(185), pp. 53-69.
36. Olanrewaju, O.G., Aremo, A.G. and Aiyegbusi, O.O., 2015. Banking sector reforms and output growth of the manufacturing sector in Nigeria. *Journal of Economics and International Finance*, 7(8), pp. 183-191
37. Oputu, E.N., 2010. Banking sector reforms and the industrial sector: the bank of industry experience. *Economic and Financial Review*, *48*(4), 3.
38. Oyebowale, A.Y., 2020. Determinants of bank lending in Nigeria. *Global Journal of Emerging Market Economies*, *12*(3), pp. 378-398.
39. Kashyap, A.K. and Stein, J.C., 1994. Monetary policy and bank lending. In *Monetary policy* (pp. 221-261). The University of Chicago Press.
40. Shijaku, G. and Kalluci, I., 2013. Determinants of bank credit to the private sector: The case of Albania.
41. Stepanyan, V. and Guo, K., 2011. *Determinants of bank credit in emerging market economies*. International Monetary Fund.
42. Sharma, P. and Gounder, N., 2012. Determinants of bank credit in small open economies: The case of six Pacific Island Countries.
43. Stiglitz, J.E. and Weiss, A., 1981. Credit rationing in markets with imperfect information. *The American Economic Review, 71*(3), pp. 393-410.
44. Timsina, N., 2017. Determinants of bank lending in Nepal. *NRB Economic Review*, *20*, pp. 22-42.
45. Uwalomwa, U., Uwuigbe, O. R. and Oyewo, B., 2015. Credit Management and Bank Performance of Listed Banks in Nigeria: *Journal of Economics and Sustainable Development*, *6*(2), pp. 27-32.
46. Tobin, J., 1969. A general equilibrum approach to monetary theory. *Journal of Money, Credit and Banking, 1*(1), pp. 15–29.