



Business, Management and Economics Research

ISSN(e): 2412-1770, ISSN(p): 2413-855X

Vol. 2, No. 5, pp: 90-95, 2016

URL: <http://arpgweb.com/?ic=journal&journal=8&info=aims>

Bank Credits and Performance of Agricultural and Manufacturing Sectors in Nigeria, 1970-2013

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Abstract: This study examined the impact of bank credits on the performance of Agricultural and Manufacturing sectors using annual time series data from 1970-2013. Using co-integration and error correction mechanism for the analysis, the study revealed that a long run relationship exists between bank credits and Agricultural and Manufacturing sectors output respectively. Given the error correction mechanism results, the study showed that bank credits exhibited negative significant impact on the performance of both agricultural and manufacturing sectors in Nigeria. Based on these findings, the study recommends among others: Bank Credits to the Agricultural and Manufacturing Sectors should be properly monitored to ensure that funds are not diverted for other purposes, Recipients of these Bank Credits to the Agricultural and Manufacturing Sectors should be made to undergo entrepreneurial training and as well on how to pay back as at when due, so as to reduce the risks associated in giving out these Credits to the Agricultural and Manufacturing Sectors.

Keywords: Bank credits; Agricultural sector; Manufacturing sector; Nigeria.

1. Introduction

Bank credits facilities are necessary tools for growth and development of any economy. Economic growth is accelerated when banks credit facilities are sufficient and accessible to the productive sectors - manufacturing and agriculture. Conversely, economic growth and development will be negatively affected when bank credits become insufficient and inaccessible to the productive sectors. According to Ademu (2006), bank credits can be employed to prevent economic activities from a complete collapse in the occurrence of natural disasters, such as drought, disease, or flood.

Despite the credit guidelines and regulations of Central Bank of Nigeria (CBN) such as The Agricultural Credit Guarantee Scheme Fund of 1979, The Trust Fund Model of 2001, The Small and Medium Industries Equity Investment Scheme of 2001, Agricultural Credit Support Scheme of 2006, The SME/Manufacturing Refinancing and Restructuring Fund of 2010 etc. which are aimed at stimulating growth in the productive sectors, agriculture and manufacturing have suffered deficient access to credits Akinleye *et al.* (2003). The consequences of insufficient accessible bank credits includes high levels of unemployment, fall in capacity utilization, low productivity, inability to make investments in modern machineries, low crop production which led to a continuous decline in total food supply in the economy. These have led to a high importation of various food and manufacturing items in the economy and thereby causing deficit in the balance of payments.

It is against this backdrop that the study examines the impact of bank credits on agricultural and manufacturing sectors performance in Nigeria.

The rest of the work is structured as follows; Section two provides reviews of the related and relevant literature; Section three explains the methodology; Section four focuses on the empirical results and discussions and, section five presents the conclusions and recommendations.

2. Empirical Literature

Rahman *et al.* (2014) used the logit regression method to investigate the impact of Zarai Taraqiati bank limited's credit to farmers on their agricultural productivity in Pakistan. The study is based on primary source of data collected through field survey of Bahawalpur Tehsil. Based on Logistic regression model result, the study revealed that Household size, income of the household, education of the famers, agricultural credit, short term and long term loans have significant positive impact on agricultural productivity. The positive significant effect of bank credit on

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agricultural productivity is as a result of the farmers using the acquired credit to purchase superior quality or high yield variety seeds, fertilizers and pesticides. [Obilor \(2013\)](#) evaluated the impact of commercial banks' credit to agricultural sector under the Agricultural Credit Guarantee Scheme Fund in Nigeria for the period 1983 to 2007 using the ordinary least square technique. The finding of the study revealed that Agricultural Credit Guarantee Scheme Fund and Government fund allocation to agriculture exhibited a significant positive effect on agricultural productivity. [Chisasa and Makina \(2015\)](#) in their study investigated the impact of bank credit on agricultural output in South Africa for the period 1970 to 2011 using the Johansen cointegration and error correction technique. The results revealed that bank credit and agricultural output are cointegrated. The study shows that bank credit and capital formation have positive significant impact on agricultural output in the long run. However, as revealed by the error correction result, in the short run bank credit has a negative impact on agricultural output. This reflects the uncertainties of institutional credit in South Africa. [Simsir \(2012\)](#) analyzed the relationship between credit growth and agricultural growth in Turkey using ordinary least square technique and Granger-causality test. The study revealed that bank Credit exhibited a positive significant effect on agricultural income and employment. Also, the Granger-causality test revealed a significant unidirectional relationship between credit and agricultural output at 95% confidence level. The causality runs from credit to real agricultural income.

[Tawose \(2012\)](#) investigated the effect of bank credit on industrial performance in Nigeria between 1975 and 2009 using co-integration and error correction technique. The results showed that industrial sector performance (Real Gross Domestic Product Manufacture) has a long run relationship with Commercial Banks' Loan and Advances to Industrial Sector (BLM), Aggregate Saving (SAV), Interest rate (INT) and Inflation Rate (INF). The study also revealed that commercial banks' loan and advances to industrial sector, aggregate saving, interest rate and inflation rate exerted positive significant impact on industrial sector performance (real Gross Domestic Product Manufacture) in the short run while in the long run BLM exerted insignificant negative impact. [Nwosa and Oseni \(2013\)](#) examined the impact of banks loan to SMEs on manufacturing output in Nigeria for the period of 1992 to 2010 using error correction technique. The result showed that banks loan to the SME sector had insignificant impact on manufacturing output both in the long and short run. Based on the findings, the study therefore recommends that, the need for greater deliberation and conscious effort by the government in ensuring that loans are given to ultimate users. However, [Ajayi \(2007\)](#) examined the impact of bank credits on manufacturing sub-sector performance in Nigeria from 1975 to 2003. The result revealed that bank credits and inflation negatively impacted on manufacturing sub sector. This implies that increase in bank credits retard manufacturing sector performance. [Ogar et al. \(2014\)](#) examined the influence of commercial bank credit on manufacturing sector in Nigeria for period of 1992-2011 using Ordinary least square of multiple regression analysis. The finding of the study showed that commercial bank credit has a significant effect on manufacturing sector. It was recommended that government should endeavour to ensure that there are available and sufficient credit allocated to the manufacturing sector in Nigeria with reasonable or affordable interest rates and that to meet the millennium goals, Nigeria has to depend on productive and services produced within her boundaries. [Oni et al. \(2014\)](#) examined the impact of bank credit to output growth in the manufacturing and agricultural sub sectors in Nigeria for the period 1980-2010 using the error correction techniques. The result of the study showed that bank credit has significant impact on manufacturing output growth in the short run. However, bank credit does not have significant impact on agricultural output growth both in the short and long run. Inflation and exchange rate depreciation have negative effects on manufacturing output growth in both short run and long run. The study therefore recommends that, to boost output growth in the real sector, bank credit to the real sector should be increased and made available to the manufacturing sector

Based on the empirical literature reviewed, the impact of bank credits on agricultural and manufacturing sectors performance has been inconclusive. However, this study intends to contribute to the existing literature. This is done by extending the time period of the study backward and as well as adopting a more sophisticated technique-cointegration and error correction mechanism as against previous studies reviewed. This backward looking is to capture historical facts or previous policies change which likely affected the relationship between bank credits and performance of agricultural and manufacturing sectors. . Also, in analyzing the impact of Bank credits on performance of agricultural and manufacturing sectors this work follows [Ajayi \(2007\)](#), [Simsir \(2012\)](#) and [Oni et al. \(2014\)](#) with some modifications.

3. Methodology

The data for this study are basically from secondary sources. Specifically, the data are sourced from Central Bank of Nigeria (CBN) statistical bulletins. The data covers the period 1970 to 2013. This period present a considerable time frame that is necessary to capture the effect of Bank credits on performance of agricultural and manufacturing sectors in Nigeria.

3.1. Analytical Framework

The model for this study is based on the financial intermediation theory. This theory is adopted since it reveals that bank financial intermediation affects the real sector activities and economic growth. This theory assumes that real sector activities are a linear function of financial intermediation variables. Financial intermediation theory assumes that agriculture, manufacture and other real sectors performance can be affected by credits. Also, this study follows the work of [Oni et al. \(2014\)](#) but with some modification.

3.2. Model Specification

3.2.1. Agricultural Sector Output Model

$$ASO = f(BCA, GEX) \tag{1}$$

Equation (1) states that agricultural sector output(ASO) is a function of bank credits to Agriculture(BCA) and Government Expenditure (GEX) which is a check variable.

3.2.2. Manufacturing Sector Output Model

$$MSO = f(BCM, GEX) \tag{2}$$

Equation (2) states that manufacturing sector output(MSO) is a function of bank credits to Manufacturing(BCM) and Government Expenditure (GEX) which is a check variable.

The above equations are transformed into log form in order to reduce variability. Equations 1 and 2 are operationalized for the purpose of estimation into the following equations:

$$\text{Log } ASO = \text{Log}a_0 + a_1\text{Log}BCA + a_2\text{Log}GEX + U_t \tag{3}$$

$$\text{Log } MSO = \text{Log}a_0 + a_1\text{Log}BCM + a_2\text{Log}GEX + V_t \tag{4}$$

Equations (3 and 4) show single-equation regression models (SERM) which seek to explain the relationship between Bank credits and performance of agriculture and bank credits and performance of manufacturing sector respectively. The apriori expectations of the models estimates are as follows: $a_1 > 0$, $a_2 > 0$. This shows that bank credits and government expenditure are positively related to agricultural and manufacturing output respectively.

3.3. Method of Data Analysis

The study employed the ordinary least square method (OLS) in estimating the relationship between bank credits and performance of agricultural and manufacturing sectors. The reason for the adoption of OLS method is based on its Best, Linear and Unbiased Estimates (BLUE) of the parameters of SERM. However, before estimating the model, the properties of the variables were scanned to substantiate the stationarity and long run relationship of the variables. This is as a result of most time series data being prone with unit roots problem. The econometric tools that were employed for these verifications are the Augmented Dickey-Fuller (ADF) test for stationarity and Johansen co-integration test for long run relationship of the variables.

4. Results and Discussions

4.1. Unit Roots Test

Due to high serial correlation, unreasonable F-statistic and coefficient of determination values observed in the OLS results which could be informed by non-stationarity of the variables, hence unit roots tests were carried out on the series to ascertain the stationarity of the variables.

Table-1. Unit Root Test Result of the ASO Model from 1970 -2013

Variables	ADF Test Statistic	1% Critical level	5% Critical level	10% Critical level	Order of Integration
LOG(ASO)	-5.1468	-3.5973	-2.9339	-2.6048	1(1)
LOG(MSO)	-3.0196	-3.5930	-2.9320	-2.6039	1(1)
LOG(BCA)	-7.1259	-3.5973	-2.9339	-2.6048	1(1)
LOG(GEX)	-4.1944	-3.5973	-2.9339	-2.6048	1(1)

Source: Author’s computation using- E-views 7.1

The unit roots test result is reported in [Table 1](#). The ADF test fails to reject the null hypothesis of the presence of a unit root for all the data series in levels. However, all series were integrated of order one [I(1)]. This shows that all the series were stationary at first difference. This now led to the tests for the long-run relationship between bank credits and agricultural and manufacturing outputs performance using the [Johansen and Juselius \(1990\)](#) cointegration test respectively. The results of the Johansen co-integration test are reported as follows:

4.2. Cointegration Tests

The Johansen cointegration test in [Table 2](#) shows that there is one integrating equation, suggesting that bank credits and government expenditure and agricultural output are cointegrated.

Table-2. Johansen Co-integration Test Result of the ASO Model from 1970 - 2013

Hypothesized CE(s)	No. of	Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value
None **		0.458324	44.84704	34.91	41.07
At most 1		0.305752	19.09740	19.96	24.60
At most 2		0.085862	3.770514	9.24	12.97

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 2 cointegrating equation(s) at 5% significance level

Source: Author's computation using- E-views 7.1

The Johansen cointegration test in [Table 3](#) shows that there is one integrating equation, suggesting that bank credits and government expenditure and manufacturing output are cointegrated.

Table-3. Johansen Co-integration Test Result of the MSO Model from 1970 – 2013

Hypothesized No. of CE(s)	Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value
None **	0.446733	28.61679	24.31	29.75
At most 1	0.084417	3.756363	12.53	16.31
At most 2	0.001243	0.052225	3.84	6.51

*(**) denotes rejection of the hypothesis at 5%(1%) significance level

L.R. test indicates 1 cointegrating equation(s) at 5% significance level

Source: Author's computation using- E-views 7.1

The results in [Table 2](#) and [3](#) indicate that there exists one (1) co-integrating equation in each of the equation which satisfies the condition for fitting in the short run error correction model (ECM). Given that the variables are integrated of the same order, I(1) and long run relationship established, the Error Correction Model (ECM) was estimated and used for analysis.

4.3. Error Correction Mechanism

[Table 4](#) reveals that the current and one period lag of bank credits to the agricultural sector failed to conform with the apriori expectation except two period lag. Current and one period lag of bank credits to the agricultural sector are statistically significant at 5 and 10 percent level respectively while two period lag is insignificant in explaining variation in agricultural output in the short run. This result implies that a percentage increase in bank credits to the agricultural sector decreased the agricultural sector output in Nigerian economy. This fall in agricultural sector output when there is an increase in banks credits to the agricultural sector can be attributed to misappropriation of these credits provided by the banks. This could also be attributed to the fact that bank credits given to farmers for agricultural purposes to increase their agricultural ventures are diverted for other purposes such as marrying more wives, taking care of their families, drinking of alcohol etc.

Table-4. The Error Correction Result of the ASO Model from 1970 - 2013

Variable	Coefficient	T-statistic	Probability
C	-4.294261	4.69236	0.0011
ΔLogBCA	-0.428054	-3.47852	0.0345
$\Delta\text{LogBCA}(-1)$	-0.146272	-1.33387	0.0709
$\Delta\text{LogBCA}(-2)$	0.004503	0.03905	0.2788
ΔLogGEX	0.227306	0.69555	0.0975
$\Delta\text{LogGEX}(-1)$	0.412994	-1.02028	0.3344
$\Delta\text{LogGEX}(-2)$	-0.33170	-3.48983	0.0011
ECM(-1)	-0.186073	-2.59483	0.0251

$R^2 = 0.89$; Adjusted $R^2 = 0.88$; F - statistic = 172.13; Durbin Watson = 1.77

Source: Author's computation using- E-views 7.1

[Table 4](#) also shows that the coefficient of ECM (-1) has right negative sign and is statistically significant. This provides important information about the short run relationship between agricultural output and bank credits and government expenditure in Nigerian economy. The coefficient of ECM (-1) specifies that changes in ASO respond to a deviation from the long run equilibrium. With the coefficient of -0.19, it means that about 19 percent of disequilibrium in the previous year is correct or adjusted in the current year. This means that increase in bank credits is followed in the next year.

Table-5. The Error Correction Result of the MSO model from 1970 - 2013

Variable	Coefficient	T-statistic	Probability
C	-3.584988	2.84973	0.0488
ΔLogBCM	0.040533	0.24825	0.1535
$\Delta\text{logBCM}(-1)$	-0.177631	3.81053	0.0039
$\Delta\text{logBCM}(-2)$	-0.434543	-2.07762	0.0472
ΔlogGEX	0.126000	0.27530	0.1775
$\Delta\text{logGEX}(-1)$	-0.169561	-0.91968	0.3744
$\Delta\text{logGEX}(-2)$	0.230897	1.16793	0.2411
ECM(-1)	-0.121523	-2.84973	0.0251

$R^2 = 0.78$; Adjusted $R^2 = 0.77$; F - statistic = 74.83; Durbin Watson = 2.16

Source: Author's computation using E-views 7.1

Table 5 shows that one period and two period lag of bank credits to the manufacturing sector failed to conform with the apriori expectation except the current period of bank credits to the manufacturing sector. One and two period lag of bank credits to the manufacturing sector are statistically significant at 5 percent level in explaining variation in manufacturing sector output while the current period of bank credits is insignificant. This result implies that a percentage increase in bank credits will significantly decrease the manufacturing sector output in Nigerian economy. This could be attributed to the rising cost of doing business, credit diversion for personal use (high risks exposure) and inadequate infrastructure which tend to surpass the effect of bank credits. Table 5 also shows that the coefficient of ECM (-1) has right negative sign and is statistically significant. This provides important information about the short run relationship between manufacturing output and bank credits and government expenditure in Nigeria. The coefficient of ECM (-1) specifies that changes in MSO respond to a deviation from the long run equilibrium. With the coefficient of -0.12, it means that about 12 percent of disequilibrium in the previous year is correct or adjusted in the current year. This means that increase in bank credits is followed in the next year.

5. Conclusions and Policy Recommendations

The bank credits remain key to the growth of agricultural and manufacturing sectors performance and therefore require adequate increase and monitoring to achieve the desired growth. The results of the work show that bank credits to the agricultural and the manufacturing sectors exert negative significant effect on agricultural and manufacturing sectors performance in Nigerian economy within the period under study.

Based on the findings, the following recommendations were made:

- Bank credits to the agricultural and manufacturing sectors should be properly monitored by the institutions responsible to ensure that funds are not diverted for other purposes in order to boost the sectors performance.
- Recipients of agricultural and manufacturing sectors bank credits should be made to pay back as at when due so as to reduce the risks associated in giving out these credits.
- Furthermore, there is need to put a mechanism that will make the recipients of these bank credits undergo training on entrepreneurial skills on how to manage their businesses.

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