SECTORAL MICROCREDIT ALLOCATION AND ECONOMIC GROWTH IN NIGERIA: AN ERROR CORRECTION APPROACH

ZACCHARIAH L. E.,

DEPARTMENT OF FINANCE AND BANKING, UNIVERSITY OF PORT HARCOURT, RIVERS STATE, NIGERIA

NWINEE BARISUA FORTUNE

DEPARTMENT OF FINANCE AND BANKING, UNIVERSITY OF PORT HARCOURT, RIVERS STATE, NIGERIA

&

NNAMDI IKECHUKWU SAMUEL

DEPARTMENT OF FINANCE AND BANKING, UNIVERSITY OF PORT HARCOURT, RIVERS STATE, NIGERIA

Abstract

This study applied "Vector Error Correction Model" to examine possible effect of sectoral micro-credit allocations or distribution on Nigeria economic or monetary growth. This study was aimed at ascertaining the extent to which micro-fund allocated or distributed to some real sectors impacted or affected Nigeria economic growth. Time series data were sourced from CBN report from 1992-2019, Nigeria economic welfare (GDP) was used as dependent parameter while micro-funds allotted to agriculture/forestry, mining/quarrying, manufacturing/food processing, real estate/construction and transport /commerce were used as independent parameter to capture sectoral micro-funding allocation. Multiple regressions were used to estimate the association between sectoral micro-fund distribution and economic welfare while descriptive statistics were employed to examine vacillations or fluctuation in the variables. Ordinary Least Square (OLS), Augmented Dickey Fuller (ADF) Test and Johansen Co-integration test were used to conduct the investigations and analysis. The study revealed that 57.7% changes in Nigeria GDP could be explained by changes in micro-fund allotted to these sectors. Micro-fund allotted to transport/commerce positively and inappreciable impacted on GDP, micro-fund allotted to real estate/construction sector negatively and inappreciable impact on GDP, micro-fund allotted to manufacturing sector positively and appreciable affected GDP, micro-fund allotted to mining/quarrying negatively and inappreciably impacted on GDP while micro-fund allotted to agriculture/forestry sector negatively and appreciable impacted on GDP in Nigeria. From these findings, it was concluded that micro-fund allotted to these sectors appreciable impacted on economic growth in Nigeria and therefore recommends for re-introduction of abolished compulsory sectoral lending operation and sectoral reforms to attract microcredits.

Keywords: Sectoral Microcredit Allocation, Economic Growth, Error Correction Approach.

Introduction

The common opinion that fund or money has massive and key part to play in realizing and achieving the macro-economic objectives of complete employment, input growth, price stability and balance of trade is traceable to the theories of classical economic policy which was deepened further by economists of the early 20th centuries like Schumpeter who in 1911 stated that creation of fund via banking system was crucial source of realizing

entrepreneurial objective of empowerment to motivate and propel real monetary growth and economists of the late 20th century like Mackinnon and Shaw (1973) also stated that regulating monetary sector of any nation's economy limits efficiency of their financial or monetary market.

CBN in December 2005, reformed Nigeria-based community banks and then introduced micro-finance scheme to improve access of micro business owners and low revenue families to monetary services needed to modernize and propel their business operations to contribute appreciably to faster monetary growth (Akanji, 2011). The reasoning or rationale behind this move was that it is impossible to accomplish inclusive growth without first improving or enhancing access of real sector to relaxed monetary services. Microfinance and development theories were derived from conventional development theories (Eze & Mbanaso, 2014; Iganoga & Asamotan, 2018). Micro-finance and rural monetary growth concept which were accepted by several country is expressed as process by which continuous increase in productivity and revenue of urban/rural workers and families are accomplished (Adama & Kromiti, 2008).

Naturally, micro funding involves provision of needed monetary services to real poor and low-revenue families who do not have access to formal monetary firms (Moruf, 2013). Kamath (2009) also sees micro-finance as "the practice of offering small, collateral-free loans to people who otherwise would not have access to capital to begin small businesses or other income-generating activities". Micro-funding comprises of provision of wide range of monetary services like loan, deposits, insurance, payment services and fund transfers real poor/low-revenue families and micro-businesses. It gives room for replacement of debt with high cost thereby improving disposable revenue. It inculcates monetary discipline which triggers assets ownership and enhance capacity to absorb shocks because of appreciable access to funds, insurance and savings products. In developing nations with poor institution infrastructure, micr0-funding is crucial monetary tool which helps or aid in expanding their monetary services depth. Thus, introduction of micro-funding firms is an admirable one being that it replaced malfunctioning community banks (Asor et al, 2016).

The fundamental theory backing microfinance firms is the availability of monetary services to the formally omitted sector. Micro-funding firms are targeted at availing poor individuals with fund needed for investments, liquidity that would give them room to take full advantage of certain monetary opportunities when they are presented and chance to gather assets and obtain needed access to fund to protect their business against economic shocks (Akanji, 2011). Also, for these micro-funding services to remain available/ accessible and sustainable/ viable in long term.

Not minding these explained roles, microfinance firms are confronted by several challenges and issues which are loan diversion to zero-productive ventures, high default rate as concern loan repayment, poor infrastructure and illiteracy problem in rural people. Nigeria estimate as concern unreachable people that need micro-funding services is over 40 million and these firms are do not possess capacity to address this issue and other monetary services needed by micro businesses and more than 200 million Nigeria active populace (CBN, 2018).

Furthermore, nearly five years after initialization of this scheme, record revealed

that massive distress already exist in monetary system as micro-funding firms failed to accomplish their saddled responsibilities. The investigation conducted by CBN between in 2010 from March down to June showed that these firms did not properly reach their intended market "the active poor" (Akanji, 2011). Consequently, CBN closed-down several micro funding firms because of several issues and challenges witnessed by these firms which resulted to review all regulation and supervision Procedures in 2011. NDIC joined with CBN in 2013 to conduct routine investigation on 731 micro-funding firms operating within Nigeria and they uncovered that some of these firms were not capable of fulfilling their set responsibility to their clients and customers as at and when due and that 106 micro-funding firms had issues of serious concern regarding regulatory problems.

There are several forms of researches on impacts of micro-finance, some scholars concentrated on impact of micro-funding on economic or monetary growth (Nwude and Anyalechi, 2018; Andabai and Jessie, 2018; Asor, Essien, and Ndiyo, 2016), some focused on microfinance and growth (Lawanson (2016; while others concentrate on micro-funding and performance of SMEs (Ofeimun and Nwakoby, 2018; Chiazor, Jegede, Ozoya, and Adebayo, 2018. Studies on sectoral micro-funds distribution or allocations and economic or monetary growth is scanty and inconclusive in literature, therefore, this paper examined possible impacts of micro-funds allocated several real sectors and Nigeria economic welfare.

Literature Review

Conceptual Framework

Microcredit

Boudreaux and Cowen (2008) stated that "microcredit is a micro finance activity where microfinance banks extend credit to micro-small business owners or the low-income earners to meet their financing needs". It is perceived as alternative to conventional lending from banks. It is a human means of availing fund to poor individuals based on Chinese proverb "Give a man a fish and you feed him for a day". It is considered as innovation in finance world and is at microfinance heart. Historically, concept and ideas of microcredit is traceable to 1970s when it is considered as small loan usually less than N100, 000 and higher than N20, 000 given to poor people or people with low-income with little or zero-collateral. Clients of micro-funds firms are people who are considered to be close to poverty line, thus this loan allow micro-businesses to create income for good standard of living.

Microfinance Banks

CBN (2004) report sees microfinance as concerned with providing monetary services to poor individuals who, normally, are not serviced by conventional monetary firms. Robinson (2001) stated that this concept, microfinance is concerned with small-scale monetary services mainly in form of fund or savings which are provided to individuals "who farm or fish or herd; who operate small enterprises or micro-enterprises where goods are produced, recycled, repaired, or sold; who provide services; who work for wages and commissions; who gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and other individuals and groups at the local levels of developing countries, both rural and urban area".

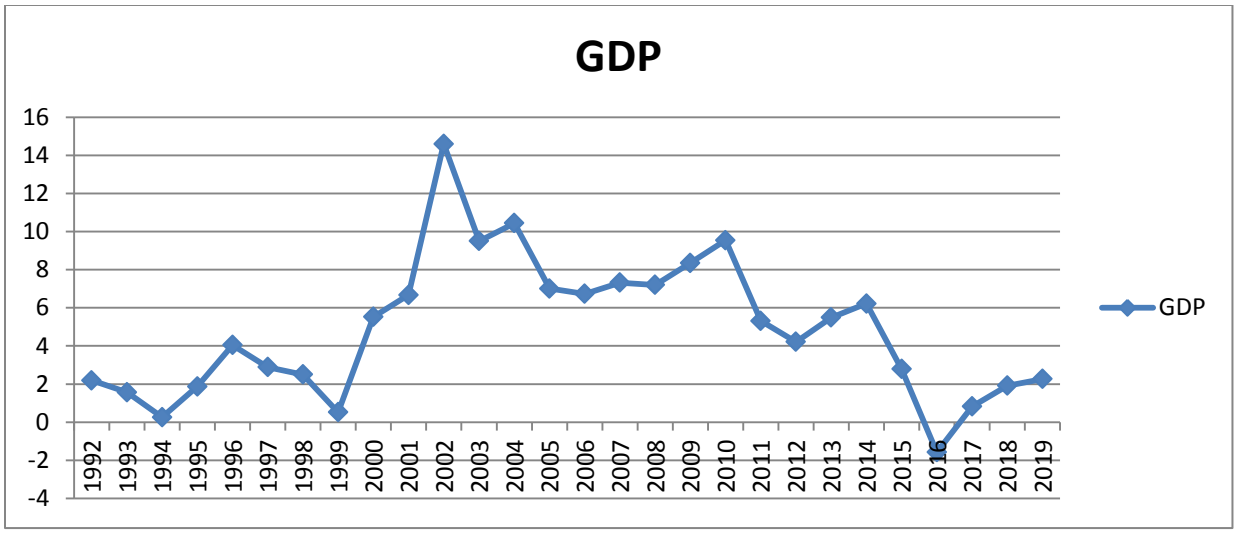
The Government and CBN acknowledged that micro finance firms are

crucial tools as concern to paucity eradication by empowering micro small business owners. The CBN needed to witness continuous monetary services made available to people who could not access conventional monetary services hence they created and established microfinance firms. Micro-funding firms are crucial in accomplishing these goals and are prompted to be viable commercially via suitable policy regulation framework. Currently Nigeria has 820 micro-funding firms till recently when it was noticed that 224 were terminally insolvent which resulted in withdrawal of their operation license. However, out of these 224 micro-funding firms whose licensees were cancelled 121 licenses were given back for operation (The Punch, 2010).

Concept of Economic Growth

According to Todaro (1977) "economic growth is the increase overtime of an economy's capacity to produce those goods and services needed to improve the wellbeing of the citizens in increasing numbers and diversity". It is also seen as continual process through which production capability of any nation or entity is elevated to foster increased national revenue level. Baumol and Blinder (1988) perceive it as process that occurs "when an economy is able to produce more goods and services for each consumer", while Tadaro (1999) sees it as "the expansion of the economy to produce more goods, jobs and wealth" similarly Henderson and Poole (1991) see it as "the increase in output and other measures of material progress at a certain period. It is also said to be either growth in national output as measured by GDP or GNP" or growth in national average living standard measured by Gross National Product per-capital.

Dornbusch, et al. (1994) maintained that economic or monetary growth concentrate on expanding capacity to produce effectually over time and for this expansion of capacity to produce effectually need increased "natural resource, human resource, capital and technology" therefore economic or monetary growth arise from input growth like labor, funding and technology. Jhingan (1997) sees economic growth "as the process whereby the real per capita income of a country increases over a long period of time. Economic growth is measured by the increase in the amount of goods and services produced in a country". Growing economy is known for producing more products in every successive period. Therefore, growth takes place when "an economy's productive capacity increases which, in turn, is used to produce more goods and services". Beardshaw, et al (1998) see economic growth "as an increase in the real GDP per capita of a nation; while the Encyclopedia of earth defined economic growth as an increase in gross domestic product (GDP)". Nigeria monetary growth over these years could be shown in figure 1 below:



Source: Excel Output 2021

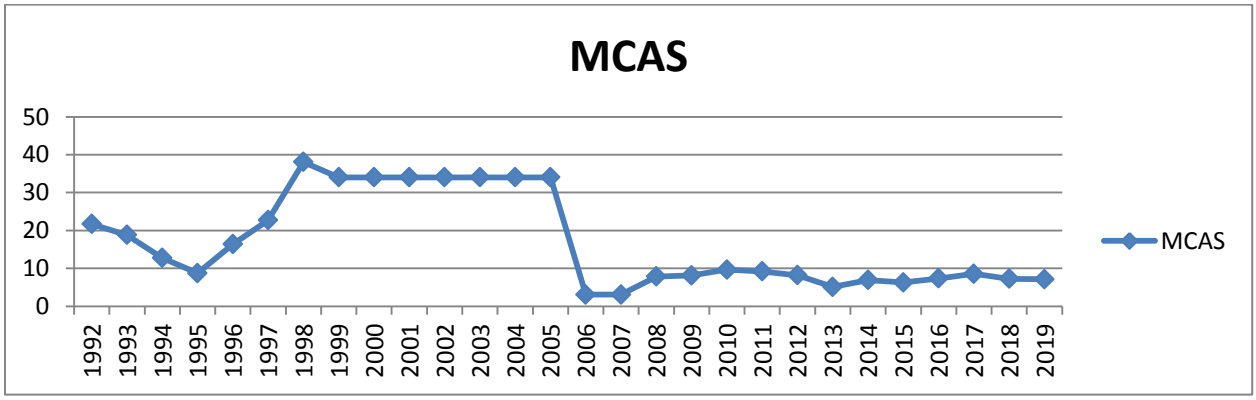
Figure 1: Fluctuations of Nigerian Gross Domestic Product (1992-2019).

The trend revealed that Nigeria GDP was below 10 percent from 1992 to 2002 but rose to highest in 2003 and this increase in these periods is traceable to reforms in microfinance firms. It could be recalled that micro-funding firms were reformed from community bank. The negative growth rate in 2016 is traceable to economic recession in Nigeria within these periods.

Microcredit to Agriculture and Forestry

This means microcredit allocated or allotted to Agriculture and forestry sector. Presently, ratio of credit allotted to private sector and GDP is being utilized as conventional yardstick to assess sustainable credit levels. Jhingan (2005) stated that giving credit room to grow naturally in proportion to general economic and monetary activity is usually standpoint for policy-makers currently. In last few years, studies on impact and effects of banking sector credit on real monetary activities improvement like agriculture has motivated detailed academic and captivating debates.

Proportion of micro-fund allotted to agriculture sector to entire micro-fund is shown in figure 2 below:



Source: Excel Output 2021

Figure 2: Fluctuations of Proportion of Microcredit to Agriculture Sector to Entire Microcredit (1992-2019).

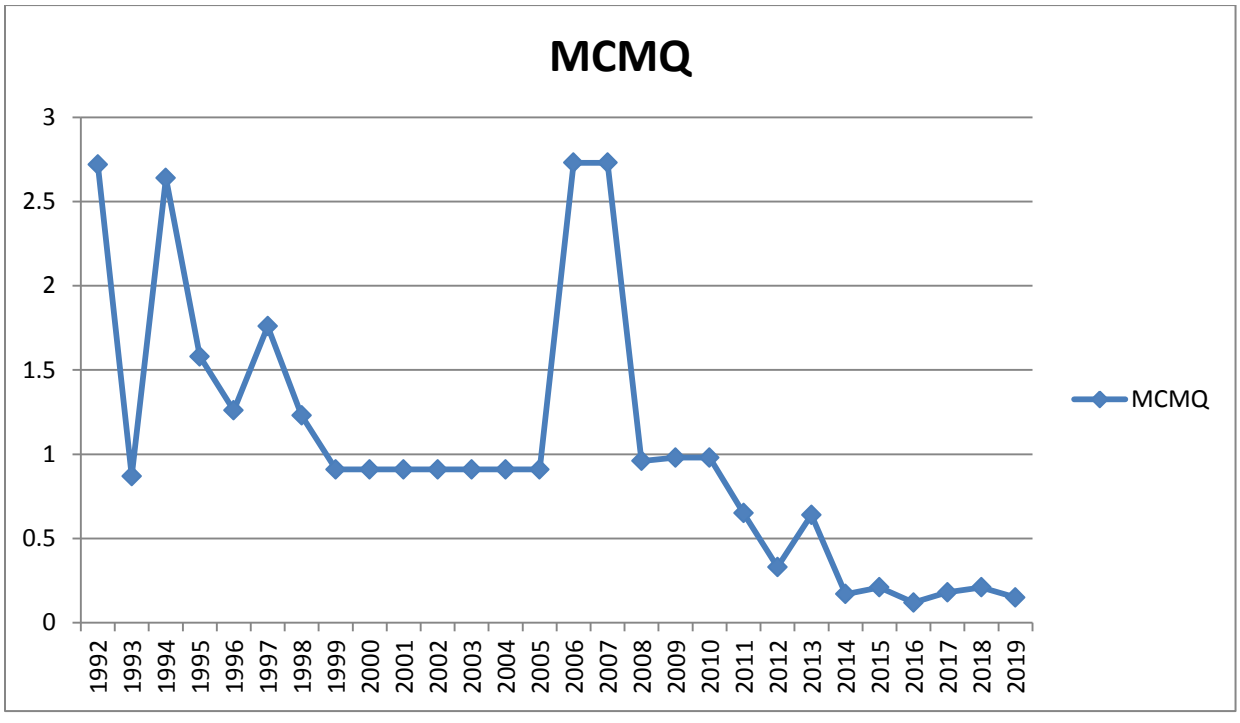
Figure 2 illustrate percentage of microcredit to the agricultural sector to total microcredit within the periods covered in this study. The trend shows that microcredit to the agricultural sector less than 40 percent of total credit over the periods.

Microcredit to Mining and Quarrying

This means microcredit allocated or allotted to mining sector. Since Mining is among oldest monetary operation in Nigeria which dated back to primeval times when people explored clay and iron crudely for production of their utensils, cosmetics and agricultural tools. Early European explorers mostly British, German and Spanish discovered and explored tin, gold and zinc and moved to their countries. Records revealed that organized exploring operation in Nigeria stated since in 1903 when Secretary of State for Colonies inaugurated mineral surveys of the Southern and Northern Territories respectively.

The main mineral occurrences discovered by survey teams are lignite deposits at Asaba, lead-zinc ores, tin and columbite in south-east, monazite, and limestone and lead-zinc ores at Abakaliki district. Others are coal in Enugu, brine springs in Arufu and Awe, Galena in Jos, iron ore in Niger and Kwara and marble in Jakura. Mining operation in controlled form, however, commenced in 1915 with coal production in Enugu (CBN, 2016).

Figure 3 shows variation in proportion of micro-fund allotted to mining/querying to entire microcredit.



Source: Excel Output 2021

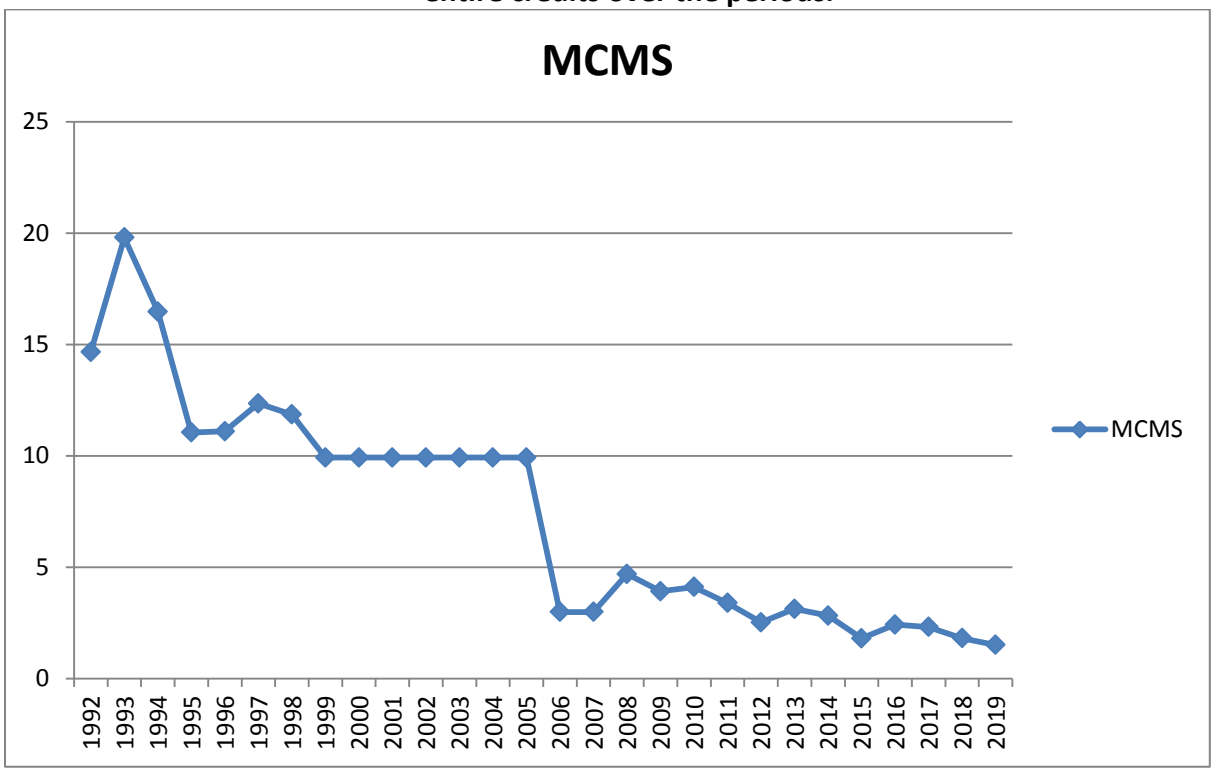
Figure.3: Fluctuations of Percentage of Microcredit to Mining and Quarrying to Total Microcredit (1992-2019).

Figure 3 shows percentage of micro-fund allotted to mining/quarrying to total microcredit within the periods covered in this study. The trend also shows that microcredit to the mining and quarrying less 3 percent of total credit over the periods.

Microcredit to Manufacturing and Food Processing

As regards microcredits to manufacturing and food processing, Nigeria manufacturing sector fell below global set standard in 2012 and it has not recovered fully but private investors interested to explore mining sector might just aid in boosting it back provided good reform programs and Impervious business ethics do not hinder or cripple it. Also, Nigeria food processing firms is valued currently at $10 billion and provides projected 10 million direct works. Not minding that Nigeria is among global largest producers of agriculture products, she has constantly failed for years as concern deriving maximal comparative benefit from this industry.

Figure 4 shows that micro-funds to manufacturing /food processing sector as percent of entire credits over the periods.



Source: Excel Output 2021

Figure 4 Fluctuations of Percentage of Microcredit to manufacturing/ food processing sector to Total Microcredit (1992-2019).

Figure 4 illustrates percentage of microcredit to the manufacturing sector to total microcredit within the periods covered in this study. The trend also shows that microcredit to the manufacturing sector was on the decrease within the periods. The steady decrease in microcredit to manufacturing sector could be traced to the fact that Nigeria is import dependent hence poor performance of the sector.

Microcredit to Real Estate and Construction

Real estate micro-credit allocation is seen as fund provided by micro-finance systems needed to involve in real-estate development and other associated operations. It is essential ingredient in modern day real-estate development and several massive developments would be impossible as concern taking their current scale without significant credit. Housing funding system is not viable in Nigeria which makes fund mobilization for housing purposes difficult.

Figure 5 shows percentage in microcredit to real estate and construction as percentage of total credit.

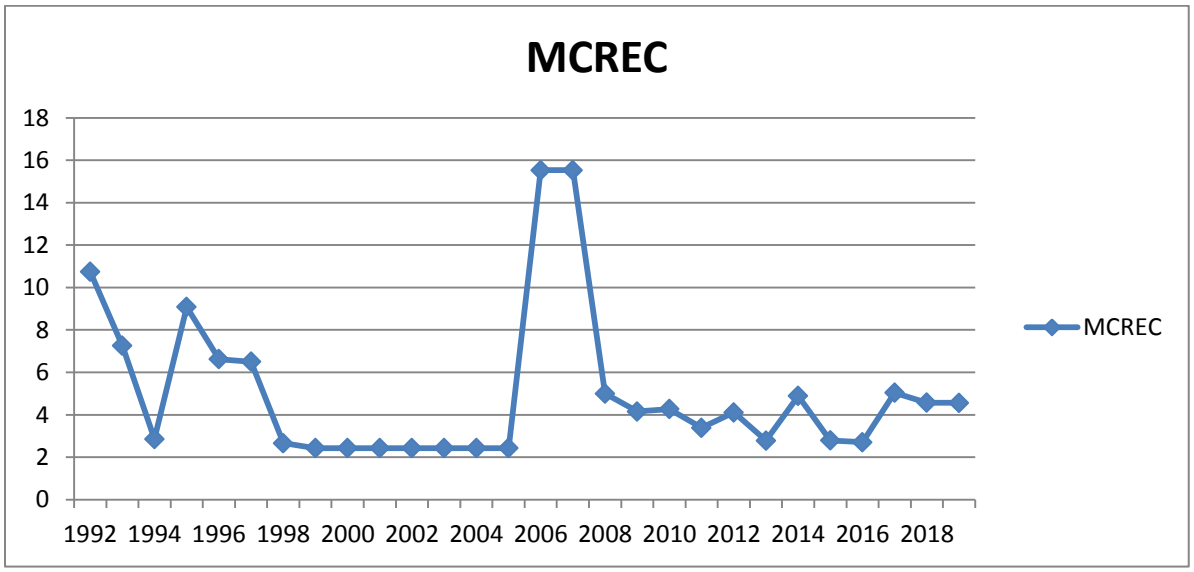


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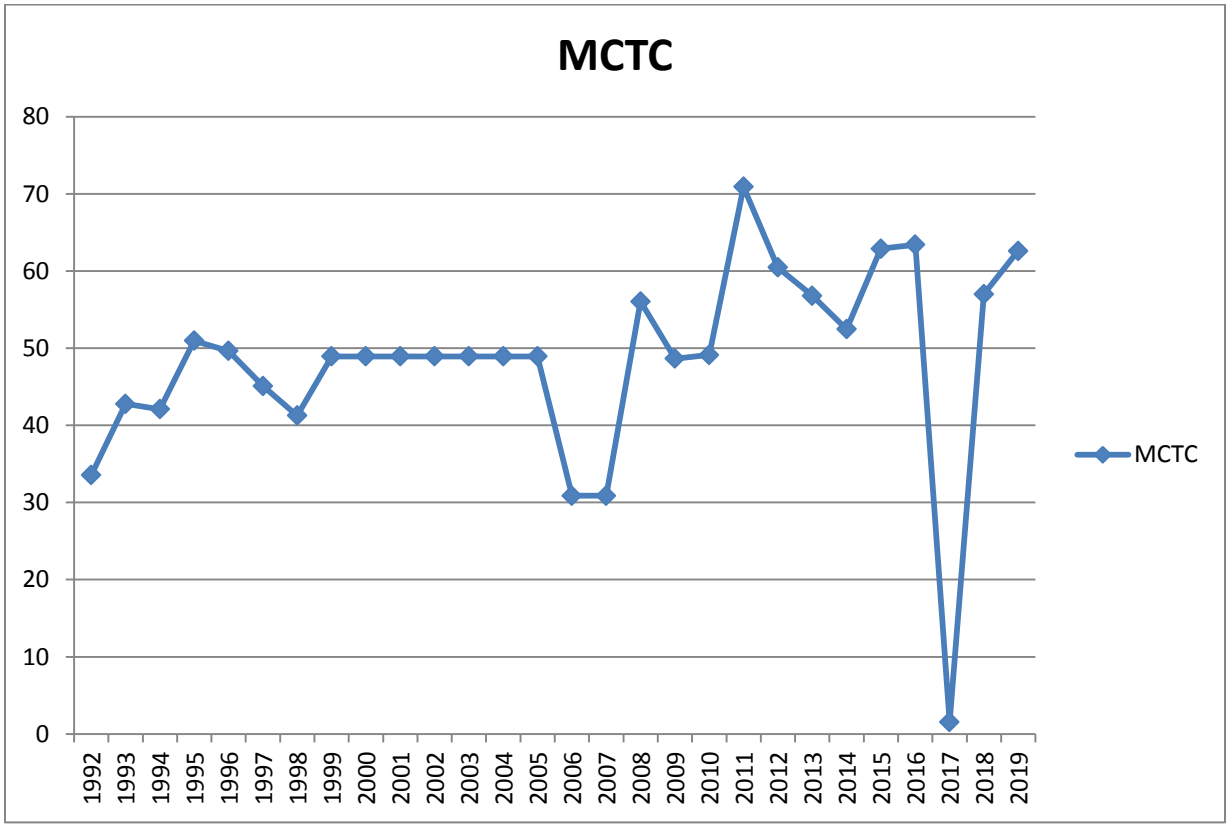
Figure 5: Fluctuations of Percentage of Microcredit to real estate and construction to Total Microcredit (1992-2019).

Figure 5 illustrate percentage of microcredit to real estate/construction to total microcredit within the periods covered in this study. The trend shows that microcredit to real estate/construction was below 12 percent from 1992 to 2005 but rose to almost 16 percent 2007 and 2008 but reduced again below 6 percent. The high fluctuation of the variable can be traced to ill performance of microfinance institution.

Microcredit to Transport/Commerce

Nigeria transportation scheme is one of the key limitations to Nigeria monetary development as transportation infrastructures has continually remained in very critical shape. Transport has equally suffered several setbacks in Nigeria mostly due to bad management and maintenance. Most Seaports, Airports, Railway and Road based transportation facilities are far below normal standards. Transportation is crucial aspect of human operations, and form basis of every socio-economic connection. Undeniably, two locations cannot interact appreciably without functional means of movement. Thus, in most advancing nations, insufficient transport amenities are usually common. Thus, good transport facilities are crucial to support monetary or economic growth and advancement. Since independence in 1960, the issue with Nigeria transport system is bad roads; insufficient number of trucks and buses, overcrowded trains and congested ports which are now

common and conventional characteristics of advanced nations. The physical challenges include shortage of trained transport planners, capital bottlenecks, serious concerns regarding institution reforms and ineffective road-way regulations. The proportion of transport in GDP is only 3%.



Source: Excel Output 2021

Figure 6: Fluctuations of Percentage of Microcredit to Transport and Commerce to Total Microcredit (1992-2019).

Figure 6 illustrate percentage of microcredit to the transport and commerce to total microcredit within the periods covered in this study. The trend shows that microcredit to real transport and commerce was the highest among the sector within the time covered in the study except the decrease in 2017 which could be traced the increase number of failed microfinance banks.

Theoretical Review

Loanable Funds Theory

This theory of interest rate evaluation sees interest level in monetary market as arising from factors that impact loanable funds supply and demand. (Saunders, 2010) interest rate, based on this theory is ascertained in ways demand and supply are ascertained. Loanable money increases with interest elevated other factors fixed. He also stated that need for loanable funds are high as interest rate decreases other determinants fixed. According to him two factors are reason for demand curve in loanable money movement they are monetary conditions and monetary increase which is amount of fund given to lender and wanted by debtors and investors

during any set time. Interest rate factor is ascertained by association between possible borrowers and possible savers.

According to this theory, monetary sector agents intend to maximize resources availed to them with time. One manner of elevating future income could be via borrowing money now to handle investment chances in any monetary sector which would work when rate of return available from investment are higher than borrowing cost. Thus, borrowers wouldn't want to pay high interest rate than rate of return available for their funding. Savers are able to save and lend when there are promises or presence of return on what they save that would give them room to consume higher in future compare to what they will otherwise do. The level to which people would be able to forgo consumption is dependent on their time.

Endogenous Growth Theory

Solow (1956) and Swan (1956) stated that enhancement in productivity could be linked directly to rapid movement in innovation and investing more in human capital. They place massive emphasis on encouraging and motivating; innovation and providing needed incentive to businesses and central part played by knowledge accumulation as among the factors or elements of growth which implies knowledge-based industries like telecom, electronics, software and biotech which are increasingly becoming crucial in advanced nations. The advocates of this theory opined that positive externalities exist which could be explored from development of high value-added-knowledge nation that could develop and maintain suitable competitive benefits (Swan, 1956). They equally opined that advancement rate of technological is not constant in any growth model and those policies and programs from government could permanently lift growth of any nation if they result in massive competition and stimulate innovation processes.

Empirical Review

Onwubu and Okorie (2018) assessed impact of MFBs loan on industrial results or performance in Nigeria based on time period that ranged from 2008 to 2014. The study used secondarily sourced data from CBN report. The Multiple Regression Model of OLS technique was utilized as processes by STATA 11 Economic-software. This research showed that MFBs loans showed appreciable effect on industry results or performance in Nigeria over this researched period. The research thus inferred that reduction in funding cost by Nigeria government was needful.

Nwude and Anyalechi (2018) inspected possible impact of MFI activities and operations on rural monetary increment and savings capacity in Nigeria based on time from 2000 to 2015. The OLS regression was utilized as analysis technique and their findings revealed massively that introducing MFB in Nigeria haven't contributed appreciably to agriculture productivity but helped in raising rural people's savings capacity and character. As means for enhancing monetary increment in Nigeria they inferred that painstaking effort must be directed at providing basic infrastructure through government; MFI need to motivate people to involve on association lending; diversifying certain farm resources particularly risk that associate with weather change to elevate productivity.

Ofeimun and Nwakoby (2018) inspected importance of MFB to SMEs in Nigeria using data obtained from MFB and CBN report over time that range from 1990 to 2015. Ordinary least square regression was used for analysis and they equally used

normality and multi-collinear tests to inspect features of these data. This study based on results from MFB and SMEs exploratory factor revealed that micro loan given / distributed have appreciable and positive connection to SMEs increment in Nigeria basically on these times researched or reviewed. The study equally uncovered appreciably negating association between inflation and micro-loan rate and SMEs increment and inappreciable connections between micro-loan spread and SMEs increment in Nigeria and they then concluded that micro funding of SMEs by MFBs have massive impact in motivating monetary sector. Then they recommend that loaning must be targeted at preferred areas like agriculture, mining and quarrying to help stimulate increment of Nigeria monetary sector.

Rich (2018) investigated socio-economic effect of largest MFB from point of view of borrower living within rural settings in Philippines. 30 persons from their Centre for Agriculture and Rural Development were interviewed in order to comprehend their trigger or motivation to accept MFB and their saving or depositing and spending culture after getting MFI loans. This work assessed most simple reasons for involving in life insurance deposit account; literacy and, perpetual debt cycle. They equally examine most beneficial borrowers, commonest businesses they involve and why most female borrow money for husbands. Though only few people achieved monetary success via MFI loans to improve their enterprise, most people see these loans as means to survive and consume.

Doçi (2017) empirically analyzed possible associations between gross collection for MFIs and macro-monetary factors within Albania for time that ranged from 1999 to 2014. This work assessed whether any nation with high credit collection level provided through MFI showed low paucity level and macro-monetary factors also analyzed considering gross collection of MFI. This work used Augmented Dickey Fuller model for data evaluation and processing. They observed that Micro finance banks are crucial and macro-monetary factors impact on entire loan collection performance.

Zaidi (2017) explored possible effects of Akhuwat Foundation's MFB on socio-monetary conditions for borrowing using sample size 105 debtors from 13 branches from 29 branches of "Akhuwat Foundation in Lahore". Cross-section design in which borrowers were set in two groups with 60 sample size for old debtors and 45 for current debtors used in this works. Based on these data obtained from these old and current debtors this work analyzed impact of MFB on wellbeing of these debtors in area of house conditions, food security, education, paucity condition, monthly revenue and expenses of debtors' pro and prior these loan with help "with or without approach". Moreover, non-parametric technique was used in testing difference between current and old debtors as concerns consumption, expenses, revenue, paucity condition, house improvement, education, and medical care. Their results revealed that Akhuwat's loans appreciably enhanced conditions of debtors as concerns their monthly revenue, expenses, education access/ health access, and house-assets. The effect was massive in old debtors than current debtors. Finally, they concluded that Akhuwat's non-conventional technique of loan to poor and their model for common brotherhood between loan giver and debtors presents good lessons to fostering positive change in societies.

Apere (2016) inspected impact of MFB on monetary increment in Nigeria for time period from 1992 to 2013 and the research used quantitative secondarily sourced data from CBN report in 2013 to conduct their study and empirical perspective used ADF, unit root-Test, co-integration test, ECM. Empirical proves from this work revealed that operations of MFB possess ability to affect entire monetary sector, when coordinated suitably. The outcome of this work revealed that MFB loans and local investment inappreciably and positively impacted on increment in Nigeria monetary sector based on amount and level of importance of coefficient and p value and, there exist long time association between MFB loans, investment with monetary increment in Nigeria which imply that when these loans are extended via MFB to business sector don't increase when not generate for corresponding increased growth for Nigeria monetary sector. This work then inferred that MFBs need to be front-liners for moral and professional behavior by making sure that less interest rate loans are availed to suitable and viable business people.

Apalia (2017) estimated part played by MFI in Kenyan monetary sector using Kisii, Nyanza as flash points for this research. They used survey technique to help researcher achieve objective from this work and population that comprised all working MFB registered within Kisii, Kenya. Convenient sample technique was used in selecting sample and secondarily sourced data obtained from monetary statements of these MFIs in Kisii. The outcome revealed that gain before tax depend mostly on interest revenue, interest cost, shareholders' capital and loans to customers or debtors. Other appreciable factors on viability in MFB include providing for hesitant debts, deposits due for other monetary institutions. The factors considered crucial in determining monetary performance by participants are working costs, debt equity collection and labor productivity. Funding costs was maintained as main proportion for cost in any firm. Factors that are highly rated as significant by people in determining monetary sustainability are repayment, loan size and deposit.

Methodology

This study used quasi-experimental research design to examine causal association between sectoral micro-fund distribution and Nigeria economic growth. This study utilized secondary data collected from the CBN.

Table 1: Time Series Data on GDP and microcredit allocations to agricultural/ forestry, mining and quarrying, manufacture /food processing, real estate/ construction and transport/ commerce sector in Nigeria 1992-2019(%)

YEAR	GDP	MCAS	MCMQ	MCMS	MCREC	MCTC
1992	2.19	21.72	2.72	14.65	10.75	33.58
1993	1.57	18.82	0.87	19.80	7.26	42.78
1994	0.26	12.73	2.64	16.47	2.86	42.09
1995	1.87	8.73	1.58	11.05	9.08	50.96
1996	4.05	16.38	1.26	11.10	6.62	49.64
1997	2.89	22.70	1.76	12.35	6.50	45.09
1998	2.50	38.10	1.23	11.85	2.66	41.27
1999	0.52	34.05	0.91	9.92	2.43	48.94
2000	5.52	34.05	0.91	9.92	2.43	48.94
2001	6.67	34.05	0.91	9.92	2.43	48.94
2002	14.60	34.05	0.91	9.92	2.43	48.94
2003	9.50	34.05	0.91	9.92	2.43	48.94
2004	10.44	34.05	0.91	9.92	2.43	48.94
2005	7.01	34.05	0.91	9.92	2.43	48.94
2006	6.73	3.07	2.73	2.99	15.53	30.87
2007	7.32	3.07	2.73	2.99	15.53	30.87
2008	7.20	7.85	0.96	4.69	5.00	56.05
2009	8.35	8.14	0.98	3.91	4.16	48.64
2010	9.54	9.65	0.98	4.11	4.27	49.13
2011	5.31	9.19	0.65	3.39	3.39	70.91
2012	4.21	8.19	0.33	2.52	4.11	60.46
2013	5.49	5.11	0.64	3.12	2.78	56.79
2014	6.22	6.90	0.17	2.82	4.89	52.47
2015	2.79	6.28	0.21	1.80	2.79	62.89
2016	-1.58	7.35	0.12	2.42	2.71	63.41
2017	0.82	8.55	0.18	2.31	5.04	1.53
2018	1.91	7.26	0.21	1.81	4.57	57.00
2019	2.27	7.15	0.15	1.51	4.56	62.60

Source: Authors Research Desk, 2021, Central Bank of Nigeria Statistical Bulletin

GDP = Gross Domestic Product
MCAS = Micro-credit to Agriculture/ Forestry Sector
MCMQ = Micro-credit to Mining and Quarrying
MCMS = Micro-credit to Manufacturing / Food Processing Sector
MCREC = Micro-credit to Real Estate/ Construction
MCTC = Micro-credit to Transport/ Commerce Sector

Model Specification

The study models are specified below:

GDP = f(MCAS, MCMQ, MCMS, MCREC,MCTC) (1)

Transforming equation 1 in econometrics form, we have:

$$GDP = \beta_0 + \beta_1 MCAS + \beta_2 MCMQ + \beta_3 MCMS + \beta_4 MCREC + \beta_5 MCREC + \mu \quad (2)$$

Where

"GDP = Gross Domestic Product
MCAS = Microcredit in to Agricultural/forestry Sector
MCMQ = Microcredit in to Mining and Quarrying
MCMS = Microcredit in to Manufacturing/food processing Sector
MCREC = Microcredit in to Real Estate and Construction
MCTC = Microcredit in to Transport and Commerce
μ = Error term
β_0 = Regression Intercept
β_1 - $\beta 5$ = Coefficient of the

Independent variables to the Dependent" variable

Table 2: Variables and A-priori Expectations

Variable	Measurement	Notation	Expected Relationship
Gross Domestic Products	% Increase or decrease in nominal GDP	GDP	Dependent variable
Microcredit to agricultural sector	Percentage of microcredit to agricultural sector to total micro credit	MCAS	+
Microcredit to mining and Quarrying	Percentage of microcredit to Microcredit to mining and Querying sector to total micro credit	MCMQ	+
Microcredit to Manufacturing sector	Percentage of microcredit to Microcredit to manufacturing sector to total micro credit	MCMS	+
Microcredit to real estate and construction	Percentage of microcredit to Microcredit to real estate and construction sector to total micro credit	MCREC	+
Microcredit to transport and commerce sector	Percentage of microcredit to Microcredit to transport and construction sector to total micro credit	MCTC	+

Source: Authors Research Desk 2021

Econometric Analysis

Econometric Analysis

Ordinary least squares (OLS) is a procedure or technique for estimating unknown parameters in linearly regressed model. According to Hutcheson (2011) OLS regression is a linear modeling procedure or technique that could be utilized in modeling one response variable that is recorded on not less than one interval scale

Stationarity Tests

This is a statistic-based test use to ascertain stationarity features of time series data in most cased ADF test is used for this purpose to avoid counterfeit regression problem. ADF unit root test is specified as in Gujarati (2004) as follows.

$$\Delta y_t = \beta_1 + \beta_2 + \delta y_{t-1} + \alpha i \sum_{i-1}^{m} \Delta y_{t-1} + Et$$

7

Where:

Δy_t = change time t

Δy_{t-1} = lagged dependent variables value

Σ_t = "White noise error term"

"If in the above δ =0, then we conclude that there is a unit root. Otherwise there is no unit root, meaning that it is stationary. The choice of lag will be determined by Akaike information criteria".

Co-integration Test (The Johansen' Test)

It is warned that regressing two non-stationary data could result in incorrect regression thus "If the residual is found to be stationary at level, we conclude that the variables are co-integrated and as such has long-run relationship exists among them".

$$GDP_t = w_0 + \sum_{i=1}^{i} \vartheta_t MCAS_{t-i} + \sum_{i=1}^{j} \varpi_i MCMQ_{jt-i} + + \sum_{i=1}^{i} \vartheta_t MCMC_{t-i} + + \sum_{i=1}^{i} \vartheta_t MCREC_{t-j} + + \sum_{i=1}^{i} \vartheta_t MCTC_{t-i} + \mu_{1t}$$

(8)

Vector Error Correction Model (VECM)

This is a precondition for error correction procedure. When co-integration is established, it becomes crucial to move over to ECM. Thus, VECM is given as

$$\Delta y_t = \alpha\beta y_{t-1} + \sum_{i=1}^{j=1} \Gamma_j \Delta y_{t-1} + \pi + \varsigma_{t,} t = 1,\ldots..,n$$

(9)

Where

Y_t is a vector of indigenous variables in the model, α is the parameter which measures the speed of adjustment through which the variables adjust to the long run values and the β is the vectors which estimates the long run cointegrating relationship among the variables in the model. π is the draft parameter and is the matrix of the parameters associated with the exogenous variables and the stochastic error term."

Analysis and Discussion Of Results

Table 3: Presentation of Unit Root Test

Variable	ADF Statistic	MacKinnon 1%	MacKinnon 5%	MacKinnon 10%	Prob.	Decision	Summary
Unit Root at Level							
GDP	-2.058422	-3.699871	-2.976263	-2.627420	0.2619	Not stationary	Accept HO
MCTC	-2.321327	-3.788030	-3.012363	-2.646119	0.1748	Not stationary	Accept HO
MCREC	-1.441522	-3.699871	-2.976263	-2.627420	0.3182	Not stationary	Accept HO
MCMS	-1.270594	-3.699871	-2.976263	-2.627420	0.6281	Not stationary	Accept HO
MCMQ	-1.221557	-3.699871	-2.976263	-2.627420	0.2296	Not stationary	Accept HO
MCAS	-1.465212	-3.699871	-2.976263	-2.627420	0.5355	Not stationary	Accept HO
Unit Root at First Difference							
GDP	-5.868097	-3.711457	-2.981038	-2.629906	0.0001	Stationary	Reject HO
MCTC	-6.685986	-3.788030	-3.012363	-2.646119	0.0000	Stationary	Reject HO
MCREC	-5.419186	-3.724070	-2.986225	-2.632604	0.0002	Stationary	Reject HO
MCMS	-6.239204	-3.711457	-2.981038	-2.629906	0.0000	Stationary	Reject HO
MCMQ	-5.435916	-3.724070	-2.986225	-2.632604	0.0002	Stationary	Reject HO
MCAS	-4.619418	-3.711457	-2.981038	-2.629906	0.0011	Stationary	Reject HO

Source: Extract from E-view 9.0 (2021)

The time series features of our data were examined by conducting unit root test of stationarity using Augmented Dickey-Fuller (ADF) test and co-integration test using Engle Ganger co-integration procedure. The results for this stationarity test using ADF test are presented in table 3. In other to estimate impact of monetary intermediation on Nigeria monetary development, we tested for presence of unit root in panel data set. This was necessitated because we wanted to ensure that these parameters estimated are stationary series data. We utilized ADF, to reject set null hypothesis that their data are non-stationary, ADF statistics must be more negative than critical values and significant. The result is depicted in table above as revealed, there was presence of stationarity since ADF Statistical is lower than critical values within 1%, 5% and 10% respectively. From above, we conclude that these parameters are integrated in 1(I) order. The

above results enable us to present co-integration test.

Table 4: Presentation of Johansen Co-integration Test

Series: GDP MCTC MCREC MCMS MCMQ MCAS

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.820656	138.2180	95.75366	0.0000
At most 1 *	0.714659	93.53836	69.81889	0.0002
At most 2 *	0.651124	60.93256	47.85613	0.0019
At most 3 *	0.518160	33.55352	29.79707	0.0176
At most 4	0.366982	14.56978	15.49471	0.0686
At most 5	0.097982	2.681131	3.841466	0.1015

Source: Extract from E-view 9.0 (2021)

From the unit root test, we noticed that GDP which is our dependent variable in the specified equations have same order of integration with the independent parameters, we then estimated their linear combination without constant term and obtain their residual which was tested for unit root for stationarity using ADF test. From this tables 4, trace statistic shows that there are three co-integrating equations, therefore it concludes existence of co-integration among parameters because the residual obtained from linear combination of none stationary series is stationary at both 5% and 1%. Hence there is necessity to estimate an ECM that is the model in equation number.

The optimality of the lag length for the VAR model is first determined using lag length selection criteria. The criteria are sequential modified LR test statistic (LR), "Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SIC) and Hannan-Quinn Information Criterion (HQ). Table 4 (below) presents the lag length selection criteria performed at 5% significance level".

Table 5: VAR Lag Order Selection Criteria

Endogenous variables: GDP MCAS MCMQ MCMS MCREC MCTC

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-406.3218	NA	2397708.	31.71706	32.00739	31.80066
1	-315.5866	132.6129*	38601.34*	27.50666*	29.53897*	28.09189*
2	-282.8059	32.78067	82348.39	27.75430	31.52859	28.84116

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
HQ: Hannan-Quinn information criterion
SC: Schwarz information criterion

Given that the maximal order of integration equals 1, we determine the optimal lag length (k). For that we rely on AIC) and SIC. On the basis of the results, the entire information criteria give unmistakable answer, pointing to lag length 1. Table 5

shows that all lag selection criterion shows that lag 1 is chosen for VAR model estimation and VAR residual normality and stability tests were performed on the VAR model to further confirm the appropriateness of the lag length of 2.

Table 6: Presentation of Error Correction Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.104911	1.027669	3.075162	0.0428
D(GDP(-1))	0.334840	0.242980	1.378055	0.2403
D(GDP(-2))	0.701838	0.217874	3.221302	0.0322
D(GDP(-3))	0.315282	0.280175	1.125301	0.3234
D(MCTC(-1))	0.081499	0.060084	1.356425	0.2465
D(MCTC(-2))	0.095785	0.074186	1.291149	0.2662
D(MCTC(-3))	0.483706	0.148595	3.255202	0.0312
D(MCREC(-1))	0.572863	0.452056	1.267240	0.2738
D(MCREC(-2))	-0.925478	0.537322	-1.722390	0.1601
D(MCREC(-3))	-0.002477	0.371647	-0.006665	0.9950
D(MCMS(-1))	1.127853	0.810624	1.391340	0.2365
D(MCMS(-2))	1.062235	0.642631	1.652948	0.1737
D(MCMS(-3))	-0.587073	0.561667	-1.045233	0.3549
D(MCMQ(-1))	-3.692086	0.251880	-1.135370	0.3196
D(MCMQ(-2))	2.856427	0.784361	1.025882	0.3629
D(MCMQ(-3))	6.574243	0.390672	2.749955	0.0514
D(MCAS(-1))	-0.343321	0.158907	-2.160511	0.0968
D(MCAS(-2))	-0.518521	0.195799	-2.648226	0.0571
D(MCAS(-3))	0.210807	0.184499	1.142591	0.3170
ECM(-1)	-1.357236	0.333407	-4.070805	0.0152
R-sq.	0.928321	Mean dep. Var		0.016667
Adj. R-sq.	0.587847	S.D. dep. Var		2.951955
S.E. of reg.	1.895129	AIC criterion		3.991359
Sum sq. res.	14.36606	SCn		4.973070
Log likelihood	-27.89630	Hannan-Quinn criter.		4.251807
F-stat	5.726556	DW stat		2.111165
Prob.(F-stat)	0.000745			

Source: Extract from E-view 9.0 (2021)

The Error Correction result shows that (micro-fund allotted to transport/commerce sector) has coefficient 0.081499 at lag 1. Probability coefficient of this variable at lag 1 proved that micro-fund allotted to transport/communication positively but no appreciably affected growth of Nigeria monetary sector or economy.

The impacts of micro-funding to real estate/ construction on Nigeria GDP shows that (micro-funding to real estate construction has coefficient 0.57286 at lag 1, 0.09575 lag 2 and -0.00247 lag 3 while probability coefficient proved that this factor is not appreciable which means that 1% alteration in micro-funding to real estate/ construction leads to 0.57% alteration in GDP in Nigeria. This revealed the presence of

positive response to GDP to micro-funding to this factor.

The impact of micro-funding to manufacturing/ food processing on Nigeria GDP shows that micro-funding on manufacturing/ food processing has coefficient 1.127853 at lag 1, 1.062235 lag 2 and -0.587073 lag 3 while probability coefficient showed that this factor is not appreciable which means that 1% alteration in micro-funding to manufacturing /food processing sector triggers 1.2% alterations in GDP in Nigeria. This means that positive response exists between GDP and micro-funding to manufacturing /food processing sector.

The effect of microcredit to mining and quarrying on Nigeria gross domestic product shows a coefficient of -3.692086 at lag 1 while the probability coefficient proved that the variable is not significant, meaning that one percentage change in microcredit to manufacturing sector leads to -3.6 percent change in gross domestic product in Nigeria. This indicates that there is a negative response of gross domestic product to microcredit to mining and quarrying sector. The effect of microcredit to agricultural sector on Nigeria gross domestic product shows a coefficient of -0.343321at lag 1 while the probability coefficient proved that the variable is significant, meaning that one percentage change in microcredit to agricultural sector leads to 0.3 percent change in gross domestic product in Nigeria. This indicates that there is a negative response of gross domestic products to microcredit to agricultural sector.

The impact of micro-funding to agriculture forestry sector on Nigeria GDP shows that micro-funding to agriculture forestry has coefficient -0.343321at lag 1, -0.518521 lag 2 and 0.210807 lag 3 while probability coefficient revealed that this factor is appreciable which means that 1% change in micro-funding to agricultural/forestry sector triggers to -0.3 percent change in GDP in Nigeria. This indicates that negative response exists in GDP to micro-funding to agriculture /forestry sector.

The results further show adjusted r2 of 0.587847 which indicated that 58.7 percent alteration in Nigeria GDP are linked to microcredits to various sectors studied Overall, the results also revealed that F-statistic is 5.726556 with probability of 0.000745 indicating that combined impact of explanatory factors on GDP represented is statistically appreciable only. The Durbin-Watson statistic revealed 2.111165 indicated absence of auto-correlation among studied factors. Furthermore, the ECM Coefficient has negating value -1.357236 and is appreciable at 5% SL with probability 0.0152. The coefficient indicates that model has 135.7 percent speed for adjustment from equilibrium position on long time basis.

Discussion of Findings

The estimated regression results proved that micro-fund allotted to agriculture sector and mining/quarrying negatively and inappreciably impact Nigeria monetary growth as captured by GDP. Beta coefficient of factors showed that one unit increase on factors could positively impact GDP by 0.38% and 3.98%. The findings affirmed stated a-priori expectations and confirm various reforms in micro-finance institutions.

These findings concur with monetary intermediation theory by Mackinnon and Shaw in 1973 and also concur with credit rationing theory and justifies by Nigeria government to heighten operation efficiency of micro-funding firms. Empirically these findings concurred with Akani and Uzah

(2018) works that micro-funding to these sectors of Nigeria monetary sector positively but inappreciably impacted on Nigeria macro-economic stability except loaning to agriculture sector and mining and quarrying, work from Onwubu and Okorie (2018) that micro-funding bank and advances revealed appreciable impact on industrial output over studied period but negate findings from Khalaf and Saqfalhait (2019) that MFIs have no impact in improving monetary increment in Arab countries.

Conclusion and Recommendations

Conclusion

Micro-finance institution was introduced to meet monetary needs of low-income people and narrow monetary gap that exists between deficit and excessive monetary points or units. From model one of the study, 58.7% change in Nigeria GDP could be explained by alterations or change on micro-fund to these sectors of Nigeria real economy. From these findings, we conclude that micro-funds allotted to agriculture/forestry sector negatively and no appreciably impacted on Nigeria GDP that micro-funding allotted to mining/quarrying sector negatively and no significantly impacted on Nigeria GDP. Micro-fund allotted to manufacturing/ food positively and appreciably impacted on Nigeria GDP. Micro-fund allotted to real estate/construction positively and inappreciably impacted on Nigeria GDP. That micro fund allotted to transport/ commerce sector positively and appreciably impacted on Nigeria GDP.

Recommendations

From the findings, we make the following recommendations:

1. This study recommends that government need to Re-introduce banned compulsory sector lending operation in Nigeria and agriculture sector in Nigeria needs serious reforms to attract investment of micro-funding banks and that monetary authority should make sure that compulsory lending to productive areas by all micro-funding banks entrepreneur in Nigeria need to be suitably trained and adequately orientated for sound performance
2. Minimal interest rate should be charged on facilities by banks under guarantee of CBN.
3. Loans to these sectors should be guaranteed by CBN to enable these banks fund these micro-credits to real sectors of the economy.
4. Micro-funding banks need to be established in all LGA head quarter to reach needed population of people for effective mobilization of funds or deposit.
5. The various monetary sectors need reformed to propel micro-credit for increment in economy, Business environment in Nigeria must be strengthened to increase operation efficiency of micro-finance banks and businesses and environmental assessment should be carried out to enhance smooth functioning of micro-funding firms in the local governments and entire country.

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