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Original Paper

Microfinance Banking Measures and the Agricultural Sector: The Nigerian Scenario

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Abstract

The study seeks to examine the extent to which microfinance banks growth measures impact the agricultural sector in Nigeria for the period covering 1992-2016. A number of models were employed which includes the microfinance bank credit growth, deposit growth; investment growth and asset growth were used as predictor variables. The research estimated the specified models using the Cochran-orcutt regression model, applied on time series annual data from the central bank of Nigeria statistical bulletin and annual reports 2017 edition and World Bank national account data employing both descriptive and inferential statistics in analyzing the time series data. The results garnered from the data analysis indicated among other things that; Microfinance bank credit growth and agricultural production contribution to gross domestic product was reported negative but significant at 1%, all the other variables found to have a positive relationships with agricultural contribution to gross domestic product. Given the above findings, the following recommendations are made: The central bank if Nigeria and other microfinance banking regulatory agencies charged with supervision of the microfinance banks should put strict measures in ensuring total compliance to regulations so that credits advanced to farmers are used for purely the agricultural production purpose for which they are granted. It is therefore my recommendation that the on and off site outreach officers be empowered to ensure strict monitoring of approved credit.

Keywords: Microfinance banking, Agricultural production, Economy

1. Introduction

The Agricultural sector is among the main drivers of growth in any developing economy and it is now primarily a global concern since food security can no longer be guaranteed. Agriculture constitutes a major part of developing countries gross domestic product, a large part of rural households' monetary income and also plays a key role in providing raw materials for industries.

In Nigeria, majority of the farmers cultivates less than ten acres of land with little or no access to good road, improve seed, fertilizer and mechanized farming. They also lack access to financial services that can help them access funds resulting in the use of rudimentary technology which subsequently leads to low production.

According to the World Bank estimate, agricultural development is "two to four times more effective in raising incomes among the very poor than growth in other sectors." It is believed that an improved agricultural sector cannot be achieved without funds. The microfinance institution comes into view to make funds available to these farmers so as to mitigate against all the problems of little or no funding.

Microfinance banking is very critical to the well-being of the economy as it does not only provide financial assistant to small and medium scale enterprises but also to the real sector of the economy, thereby fast tracking economic growth in Nigeria. Among the theories that underline the concept of microfinance, it is the economic dimension that stands out as the most significant. It states that when poor people are provided with capital which they invest in income generating activities and make profit,

this will result in a virtues cycle which states that credit leads to increased production and income, and this allow for greater consumption and savings, and result to further investment (Meyer, 2002).

Providing access to financial services for the low-income earners in Nigeria has remained a daunting challenge to the manager and policy makers of the nation's economy. Robust economic growth and development cannot be attained without formulating a well thought out programme of reducing poverty through empowering the rural poor by increasing their access to credit (Babagana, 2010).

The potential entrepreneurial spirit of the poor farmer would be enhanced through the provision of micro finance services to enable them to engage in meaningful economic activities and be self-reliant, increase employment opportunities, enhance household income and create wealth (CBN, 2005; cited in Babagana, 2010).

Studies have been carried out on microfinance activities, its impact on the small businesses, co-operatives, individuals and even its effects on the growth of the Nigerian economy, we have scholars like Akpan and Nneyi (2015), Ademola and Arogundade (2014), Nwakanma, Nnamdi and Omojefe (2014), Apere (2016) and Okpara (2010).

Sulemana and Adjei (2015) assessed the impact of microfinance on agricultural production in the Pru District as a case study using a multi-method approach involving a case study and quasi-experimental (control-group) techniques. A questionnaire together with an interview guide and a checklist were used for data collection. The study established that microfinance is positively related to agricultural production and shows a significant impact on output levels.

On the other hand, scholars argue that the impact of microfinance on agriculture production is not always positive because of the risks of crop production seasonality, production system technicalities, poor loan repayment performance of agricultural lending and the cases of poor production due to pest and disease outbreak. Thus, making the sector risk high for loan procurements thereby limiting production and expansion of the sector. However, there has been relatively little research conducted on the issue of the impact of microfinance banking on the agricultural sector in Nigeria.

Therefore, this study tried to investigate the impact of microfinance activities (credit, deposit, savings and investment) on the agricultural sector using the Agricultural production to Gross Domestic Product of Nigeria as proxy using comprehensive data on Microfiance Bank Credit, Microfinance Bank Deposit, Microfinance Bank Investment and Microfinance Bank Asset of Nigeria and Agriculture production contribution to Gross domestic product for the period of the study (1992-2016) using secondary data extracted from the CBN statistical bulletin 2017.

2. Methodology

2.1 Micro Finance Banking Growth Measures

We shall measure the following growth indices in this study; Microfinance bank Credit growth, Deposit growth, Savings growth and Investment growth. And in doing this we shall use the modified Gordon dividend growth model using only the capital gain measure; $\left(\frac{y_1 - y_0}{y_0}\right) w$ hich

Means $\frac{Currentyear - previousyear}{previousyear}$

Where is Y_0 = Growth Rate of previous year.

Y_1= Growth Rate of current year.

$$\beta_0 + \beta_1 MFBCG + \beta_2 MFBDG + \beta_3 MFBIG + \beta_4 MFBAG + U_t \quad (1)$$

Where,

AGP = Agricultural production contribution to G.D.P

MFBCG = Microfinance Banking Credit Growth.

MFBDG = Microfinance Banking Deposit Growth.

MFBIG = Microfinance Banking Investment Growth

MFBAG = Microfinance Banking Asset Growth.

Often, many econometric time series are better approximated by exponential trend, normality and variance stationarity. Hence the model in equation 1 could be specified thus:

$$Log(AGP_t) = \beta_0 + \beta_1 Log(MFBCG_t) + \beta_2 Log(MFBDG_t) + \beta_3 Log(MFBIG_t) + \beta_4 Log(MFBAG_t) + \cup_t \quad (2)$$

3. Result and Discussion

Table 1. Summary of the Data Collected for Analysis

YEAR	MFBC	MFBD	MFBI	MFBA	AGP
1992	135.8	639.6	118.4	967.2	184.12
1993	654.5	2,188.20	326.6	3,198.60	295.32
1994	1,220.60	3,216.70	491.4	4,693.20	445.27
1995	1,129.80	2,834.60	354.3	4,106.50	790.14
1996	1,400.20	2,876.30	254	4,432.50	1,070.51
1997	1,618.80	3,181.90	384	4,706.40	1,211.46
1998	2,526.80	4,454.20	218.4	6,477.20	1,341.04
1999	2,958.30	4,140.30	436.8	8,903.60	1,426.97
2000	3,666.60	7,689.40	450.2	12,014.70	1,508.41
2001	1,314.00	3,294.00	304.3	4,884.40	2,015.42
2002	4,310.90	9,699.20	925.5	15,463.50	4,251.52
2003	9,954.80	18,075.00	2,261.00	28,689.20	4,585.93
2004	11,353.80	21,407.90	2,612.70	34,162.30	4,935.26
2005	28,504.80	47,523.70	3,594.10	82,866.90	6,032.33
2006	16,450.20	34,017.70	2,712.70	55,145.80	7,513.30
2007	22,850.20	4,127.70	3,795.70	75,549.80	8,551.98
2008	42,753.10	61,568.10	7,295.30	122,753.80	10,100.33
2009	58,215.70	76,662.00	8,025.00	151,610.00	11,625.44
2010	52,867.50	75,739.60	8,674.20	170,338.90	13,048.89
2011	50,928.30	59,375.90	8,959.80	117,872.10	14,037.83
2012	80,127.90	98,789.10	14,078.30	189,293.40	15,816.00
2013	94,055.60	121,787.60	14,976.50	237,837.60	16,816.55
2014	112,110.10	110,688.40	15,785.58	221,652.30	18,018.61
2015	187,247.30	159,453.50	17,737.90	343,883.10	19,636.97
2016	196,195.10	149,798.40	20,127.20	326,223.10	21,578.84

Source: Central Bank of Nigeria (CBN) Statistical bulletin (2016) National Bureau of statistics (NBS) annual abstract of statistic (2016)

Table 2. Growth Measures Variables under Consideration

(AGP)	(MFBDG)	(MFBDG)	(MFBIG)	(MFBAG
0.604	3.8196	2.4212	1.7584	2.3071
0.5078	0.8649	0.4700	0.5046	0.4673
0.7745	-0.0744	-0.1188	-0.2790	-0.1250
0.3548	0.2393	0.0147	-0.2831	0.0794
0.1317	0.1561	0.1062	0.5118	0.0618
0.107	0.5609	0.3999	-0.4313	0.3763
0.0641	0.1708	-0.0705	1.0000	0.3746
0.0571	0.2394	0.8572	0.0307	0.3494
0.3361	-0.6416	-0.5716	-0.3241	-0.5935
1.1095	2.2807	1.9445	2.0414	2.1659
0.0787	1.3092	0.8636	1.4430	0.8553
0.0762	0.1405	0.1844	0.1556	0.1908
0.2223	1.5106	1.2199	0.3756	1.4257
0.2455	-0.4229	-0.2842	-0.2452	-0.3345
0.1382	0.3891	-0.8787	0.3992	0.3700
0.1811	0.8710	13.9158	0.9220	0.6248
0.151	0.3617	0.2452	0.1000	0.2351
0.1224	-0.0919	-0.0120	0.0809	0.1235
0.0758	-0.0367	-0.2161	0.0329	-0.3080
0.1267	0.5733	0.6638	0.5713	0.6059
0.0633	0.1738	0.2328	0.0638	0.2564
0.0715	0.1920	-0.0911	0.0540	-0.0681
0.0898	0.6702	0.4406	0.1237	0.5515
0.0989	0.0478	-0.0606	0.1347	-0.0514

Source: Researcher's analysis

Unit Root Test

Table 3. Augmented Dickey-Fuller Unit Root Test for Stationarity.

Variable	State	ADF	P-value	Max Lag	AIC	D.W	Remark
Log(AGP)	Level	-2.202	0.4670	1	-0.9062	1.60	Non-Stationary
	First Difference	-3.777	0.0370	0	-0.7078	1.92	Stationary
Log(MFBCG)	Level	-4.7423	0.005	0	1.0102	1.75	Stationary
Log(MFBDG)	Level	-5.1841	0.002	1	1.8696	2.02	Stationary
Log(MFBIG)	Level	-2.8896	0.188	6	0.6648	1.55	Non-Stationary
	First Difference	-5.2312	0.002	2	1.2874	2.13	Stationary
Log(MFBAG)	Level	-3.5840	0.053	1	1.010	1.72	Non-Stationary
	First Difference	-6.4867	0.001	2	1.2689	2.31	Stationary

Source: Eview Version 8

Descriptive Statistics

Table 4. Descriptive Statistics for the Variables under Study

STATISTIC	AGP	MFBA	MFBC	MFBD	MFBI
Mean	7473.538	89109.04	39382.03	43329.16	5395.995
Median	4935.260	34162.30	11353.80	18075.00	2612.700
Maximum	21578.84	343883.1	196195.1	159453.5	20127.20
Minimum	184.1200	967.2000	135.8000	639.6000	118.4000
Std. Dev.	6952.800	105452.3	55943.27	50482.44	6407.517
Skewness	0.620910	1.110714	1.717030	1.008157	1.029342
Kurtosis	2.000884	3.116990	5.078863	2.744248	2.667620
Jarque-Bera	2.646194	5.154616	16.78588	4.303055	4.529854
Probability	0.266309	0.075978	0.000226	0.116306	0.103838
Sum	186838.4	2227726.	984550.7	1083229.	134899.9
Sum Sq. Dev.	1.16E+09	2.67E+11	7.51E+10	6.12E+10	9.85E+08
Observations	25	25	25	25	25

Source: Eview version 8

Table 5. Regression Analysis of Log (AGP) on Log (MFBCG), Log (MFBDG), Log (MFBIG) and Log (MFBAG)

Variable	Cointegrating Regression Model	Error Correction Model (ECM)	Cochran-Orcutt Model
Constant (C)	0.9550	0.1491**	1.4916**
	(0.4798)	(0.005)	(0.008)
Log(MFBCG)	0.6529**	0.0943	-0.0008***
	(0.0153)	(0.730)	(0.0099)
Log(MFBDG)	-0.0100	-0.0091	0.0015**
	(0.0950)	(0.876)	(0.0098)
Log(MFBIG)	-0.3619**	0.0350	0.3254
	(0.0170)	(0.799)	(0.092)
Log(MFBAG)	0.3978	0.0700	0.2497
	(0.0480)	(0.828)	(0.058)
$\hat{U}_{t-1}$	-	-0.1884	0.1554
		(0.208)	(0.588)
F-ratio	89.11	0.76	16.29
R^2	0.93	0.18	0.82
Engle-Granger Statistic	-3.273	-	-
	(0.5050)		
Hansen Statistic	0.5858(>0.2)	-	-
Number of Iteration	-	-	3
D.W	1.24	1.34	2.14

( )- p-value, **-significant at 5%, ***- significant at 1%, D-W= Durbin-Watson Statistic.

4. Discussion of Findings

Findings from Unit Root Test

The result of the application of Augmented Dickey-Fuller Unit Root Test for stationarity states that the Agricultural Production, Microfinance Bank Investment Growth and Microfinance Bank Asset Growth showed a unit root without significant deterministic trend coefficient at level. However, stationarity was achieved after first difference for each of the variable aforementioned. But Microfinance Bank Credit Growth and Microfinance Bank Deposit Growth was found to be stationary at level, hence no differencing was needed. The test was conducted at different lag while the choice of appropriate model was made using the lag with minimum Akaike Information Criteria (AIC) and Durbin- Watson (D.W) that is approximately 2 which signifies uncorrelated error term for the test.

Findings from Descriptive Statistics

The descriptive statistics selected for display are mean, median, standard deviation, skewness and kurtosis, minimum, maximum, Jaque-Bera statistic as well as the number of observations.

However, some of the assumptions in the use of regression model for data analysis are the assumption of normality, linearity and stationarity of the data. When a data is normal, its mean, mode and median are equal or approximately equal. Also, its skewness equals zero while its kurtosis equals 3. Stationarity

on its part could be in mean or/and in variance. When a series is non-stationary in variance, non-linear and are not normal, transformation is needed to make it normal, linear as well as stationary in variance. Based on this property, it is clearly evident from the descriptive statistics that none of the variables under study is normal (which also is evident by the value of the J-B statistic) and seems not to be stationary in variance, hence a need for transformation. Therefore, subsequent analysis on the data is done using a transformed data, which in this case, logarithmic transformation was adopted, hence handling the issue of linearity, variance stationarity and normality. Transformation is also important to stabilize the Economic/Financial data which are inherently volatile.

Findings from Regression Analysis

The regression model of Log Agriculture production contribution to gross domestic product (AGP) on Log Microfinance Bank Credit Growth (MFBCG), Log Microfinance Bank Deposit Growth (MFBDG), Log Microfinance Bank Investment Growth (MFBIG) and Log Microfinance Bank Asset Growth (MFBAG) presented Cochran-Orcutt model as the most adequate among the competing models. The cointegrating regression model has only two significant ($p<0.05$) coefficient at $\alpha = 0.05$ level of significance. Though the F-ratio (89.11) and coefficient of determination (93%) are very high, however, the Durbin-Watson statistic is very poor while the cointegration test shows no evidence of cointegration among the variables. The Error correction model has only one significant coefficient with a very poor D.W statistic. Hence, we will adopt the Cochran –Orcutt Model and the result can be interpreted in what follows:

An intercept of 1.4916 which was observed to be indicates that the level of Agriculture production contribution to Gross domestic product (AGP) when Microfinance Bank Credit Growth (MFBCG), Microfinance Bank Deposit Growth, (MFBDG), Microfinance Bank Investment Growth (MFBIG) and Microfinance Bank Asset Growth (MFBAG) are zero which is given by ($e^{1.4916}= 4.44$).

The value of the coefficient of Log Microfinance Bank Credit Growth (MFBCG) = -0.0008 which implies that an increase in MFBCG by 1% will produce a corresponding decrease in AGP by about 0.0008% when all other variables in the model are remains the same. This was found to be very significant even at $\alpha = 0.05$ level of significance despite the smallness of the value.

The value of the coefficient of Log Microfinance Bank Deposit Growth, (MFBDG) = 0.00015 implies that an increase in MFBDG by 1% will produce a corresponding increase in AGP by about 0.002% when all other variables in the model are held constant.

The value of the coefficient of Log Microfinance Bank Investment Growth (MFBIG) = 0.3254 which implies that an increase in Microfinance Bank Investment Growth (MFBIG) by 1% will produce a corresponding increase in Agriculture production contribution to Gross domestic product (AGP) by about 0.3% when all other variables in the model are held constant.

The value of the coefficient of Log Microfinance Bank Asset Growth (MFBAG) = 0.2497 which implies that an increase inMicrofinance Bank Asset Growth (MFBAG) by 1% will produce a corresponding increase in (AGP) by about .25% Agriculture production contribution to Gross domestic product when all other variables in the model are held constant.

On the model performance, the estimate of the residual is not significantly different from zero and uncorrected which is evident with the value of D.W of approximately 2. There is also an evidence of adequate goodness-of-fit with the F-ratio of 16.29 and coefficient of determination (R^2) of 0.82 indicating that Microfinance Bank Credit Growth (MFBCG), Microfinance Bank Deposit Growth, (MFBDG), Microfinance Bank Investment Growth (MFBIG) and Microfinance Bank Asset Growth (MFBAG) explained about 82% of Agriculture production contribution to Gross domestic product (AGP). Both (F-ratio and R^2) statistics, as well as the Durbin-Watson (D.W) Statistic clearly showed an adequate overall goodness-of- fit of the data using Chochran-Orcutt Model. The most appropriate model estimate was achieved at 3 iterations.

In summary, the findings includes:

1. A very strong negative relationship exists between microfinance bank credit growth and agricultural production contribution to Gross Domestic Product

2. There is a significant and positive relationship between microfinance bank deposit growth and agricultural production contribution to Gross Domestic Product.

3. There is a positive but not significant relationship between microfinance bank investment growth and agricultural production contribution to Gross Domestic Product.

4. There is a positive but not significant relationship between microfinance bank asset growth and agricultural production contribution to Gross Domestic Product.

5. Conclusion

With the findings of this research above, we therefore conclude that there exists a significant relationship between the agricultural contribution to gross domestic product and the microfinance bank credit growth and microfinance bank deposit growth but the relationship between the microfinance bank investment growth and microfinance bank asset growth is not significant.

The probable reason why the relationship between micro finance bank credit and the agricultural contribution to GDP is negative is that either the credit is mismanaged or diverted by customers to non-economic activities that do not impact the sector. From experience, it is not unknown that that most businesses in Nigeria are portfolio business existing only in the minds of the average businessman, when such business are given loans, they divet such funds to pleasure activities and not on real economic ventures. The micro finance deposit growth and asset growth reports a positive relationship meaning that growth and investment in these variables has a directly bearing on the real sectors of the economy which will also enhance the real growth of the economy, the implication is that more efforts should be geared towards growing the deposit and asset portfolios of the microfinance banking in Nigeria, From the results of the study, it is reported the credit growth of the bank as a negative relationship with the agricultural contribution to gross domestic product in the long-run but positive in the short -run. This only goes to show that credits accessed or given by these banks are diverted and not put into the sector to grow it, it is instead put into non-economic activities that don't promote growth. The other variables like investment growth, deposit growth and asset growth all contribute positively to agricultural growth to Gross Domestic Product.

Recommendations

Based on the findings of the study, the following recommendations are made: The preoccupation of this research work was to investigate the relationship between microfinance banking growth variables and the agricultural sector. At the end of analyzing data collected for the purpose of this research, certain findings which are detailed in the section above were made, On the strength of the finding, we make the following recommendation:

1 The central bank if Nigeria and other microfinance banking regulatory agencies charged with supervision of the microfinance banks should put strict measures in ensuring total compliance to regulations so that credits advanced to farmers are used for purely the agricultural production purpose for which they are granted. It is therefore my recommendation that the on and off site outreach officers be empowered to ensure strict monitoring of approved credit.

2 Investment departments of microfinance banks should ensure more credit lines are open to the agricultural sectors, which according to the study have shown that it can add to the growth of the economy.

3 Finally, Nigeria as a country can harness the gains of the concept of microfinance banking as are applicable in other countries with its attendant gains by the government partnering with these banks as it is presently doing with the active roles been played by the Bank of Industry, and other allied financial service providers to reach the farmers basically located in the rural areas of the population who are in dire need of funding.

4 From the result of this research, it is evident that the deposit of microfinance banks is critical to the growth of the Nigerian economy; it is therefore recommended that deposit mobilization function should be encouraged and awards given to outreach officers that excel in this regard.

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