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The Effects of Microfinance Banks on Agricultural Sector Performance in Nigeria (1992-2022)

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Abstract: The study examined the effects of microfinance banks on agricultural sector performance in the Nigerian economy during the period of 1982-2022. The study identified microfinance bank loan, microfinance bank deposit, microfinance bank total asset and microfinance interest rate as the dimensions of microfinance banks while agricultural output generally and for specific sectors like crop and fisheries were used as measures of agricultural sector performance Timeseries data were obtained from the CBN statistical bulletin, macrotrends, world development indicators and index mundi. The method of data analysis was the Vector Error Correction (VECM). The result showed that microfinance bank loan, microfinance bank deposit and microfinance bank total assets had negative relationship with crop output and agricultural output while microfinance bank total assets had positive significant relationship with fishery output (PV < 0.05). In the short run, the effects of microfinance variables were found to be insignificant in all cases (PV > 0.05). The study concluded that microfinance variables were significant in driving agricultural growth in Nigeria. Based on these findings, the study recommended that; deposit mobilization should be encouraged. The government should channel some assets into fishery to intensify fish production. Also, government should formulate and implement institutional strengthening policies in the areas of effective agriculture financing.

Keywords: Agricultural Financing, Agricultural Output, Crop Output, Interest Rate, Interest Rate, VECM,

Introduction

In Nigeria, microfinance banks (MFBs) have become a vital source of entrepreneurial finance at the grassroots level (Gul et al., 2017). Microfinance institutions (MFIs) specialize in providing financial services, particularly to low-income individuals. Since their inception in the 1970s, MFIs have integrated social and economic development principles alongside financial and commercial market practices (Agar, 2014).

Microfinance banking was formally introduced in Nigeria in 2007 to enhance access to credit for low-income earners and marginalized groups (Central Bank of Nigeria, 2019). The primary objective of MFBs is to serve individuals who are typically excluded from conventional financial institutions. Their services include savings, loans, domestic funds transfers, and other financial solutions designed to support micro, small, and medium enterprises (MSMEs), as outlined in Nigeria's microfinance banking guidelines. Additionally, MFBs play a crucial role in providing financial assistance to grassroots entrepreneurs, including smallholder farmers.

Agriculture in Nigeria is predominantly driven by small-scale farmers, who contribute approximately 95% of the nation's agricultural output (Mafimisebi et al., 2007). This sector is characterized by small landholdings, labor-intensive production, limited access to capital, minimal investment in farm inputs, and low productivity. Various factors hinder increased agricultural production, including inadequate access to quality inputs, poor infrastructure, outdated farming technologies, and declining youth interest in agriculture (Verheya, 2000). However, the most significant constraint remains limited access to credit, which prevents farmers from maximizing their

productivity and contributes to food insecurity and poverty at both individual and national levels.

Recognizing this challenge, the Central Bank of Nigeria (CBN) established the microfinance banking system to provide financial services to underserved populations, including farmers, who struggle to access loans from traditional financial institutions. Unlike conventional banks that rely on collateral, MFBs focus on the credibility and trustworthiness of borrowers (Olawuyi et al., 2010). To assess the impact of microfinance banking on Nigeria's agricultural sector, this study examines its effectiveness in improving financial access and agricultural productivity.

Objectives of the Study

The broad objective of this study of this study is to examine the effects of microfinance bank on agricultural sector performance in Nigeria, specifically the study;

i. ascertained the trend of the study variables;
ii. examined the effect of microfinance bank loan, microfinance bank deposit, microfinance bank total asset and microfinance interest rate on crop output;
iii. determined the effect of microfinance bank loan, microfinance bank deposit, microfinance bank total asset and microfinance interest rate on fisheries output;
iv. measured the effects microfinance bank loan, microfinance bank deposit, microfinance bank total asset and microfinance interest rate on agricultural output.

Literature

Researchers have studied the response of agricultural performance to some macroeconomic variables. Particularly, Tuaneh and Ewudbare (2017) studied the effects of financial deepening on agricultural performance. Tuaneh and Okidim studied agricultural performance amidst macroeconomic stability in Nigeria. Tuaneh and Doodei (2025) studied the Effects of Financial Inclusion on Agricultural Production in Nigeria, Tuaneh and Doodei (2025) modelled Exchange Rates and Agricultural Sector Performance in Nigeria, Tuaneh *et al* (2025) explored the effects of humana development index on agricultural output in Nigera. Tuaneh (2018) used VAR to model the interaction among macroeconomic stability indicators. Tuaneh *et al* (2021) used VECM to ascertain the dynamic linear interdependence between international trade and macroeconomic stability.

Amakor (2022) investigated the impact of microfinance credit on aquaculture and economic growth in Nigeria between 2005 and 2020. The study used fishery output as a proxy for aquaculture and Gross Domestic Product (GDP) as a measure of economic growth. Relying solely on secondary data, the research tested its hypotheses using the Granger Causality test. The findings revealed that while microfinance credit significantly influenced GDP, it had no substantial effect on fishery output. This suggests that the fishery sector in Nigeria remains underdeveloped despite its importance and scarcity. The researcher recommended that fishery and aquaculture should be recognized as viable investment opportunities requiring more financial support. Consequently, microfinance institutions and donor organizations should prioritize extending credit to the fishery and aquaculture subsectors within agriculture.

Similarly, Amakor and Anyamaobi (2022) examined the influence of microfinance credit on agricultural output in Nigeria from 2005 to 2020, using crop and livestock output as indicators. This study relied exclusively on secondary data from the Central Bank of Nigeria (CBN) statistical bulletin and other published sources. Using the Granger Causality test, the findings indicated that microfinance credit had no significant impact on either crop or livestock output. This lack of effect suggests that many poor farmers in Nigeria do not have access to microcredit, despite substantial government allocations meant for them. The researchers concluded that small-scale farmers primarily finance their own activities. To enhance food production

and export diversification, microfinance credit should be more directed toward agricultural production rather than commercial ventures. Additionally, the government should consider disbursing farm grants through community leaders, with oversight from local farmer committees to ensure proper allocation and reporting.

Obialor *et al* (2022) assessed the relationship between microfinance deposits and agricultural sector output in Nigeria. The study aimed to determine how microfinance loans, microfinance deposits, and shareholders' funds affect agricultural sector output. Using data from the Central Bank of Nigeria Statistical Bulletin covering 1992 to 2019, the researchers employed the Autoregressive Distributed Lag (ARDL) model, which is suitable for analyzing data with mixed-order integration. The empirical results indicated that both microfinance loans and deposits positively influenced agricultural sector output, whereas shareholders' funds had a negative impact. These findings suggest that microfinance institutions play a crucial role in meeting short-term financing needs in the agricultural sector. The study recommended that the government create an enabling environment for microfinance banks to improve microcredit accessibility. Specifically, the Central Bank of Nigeria (CBN) should be mandated to absorb at least 50% of the losses incurred by microfinance institutions in their efforts to provide credit to rural farmers. Additionally, measures should be taken to ensure that agricultural inputs reach the intended beneficiaries (local farmers) rather than being diverted to politicians and civil servants.

Aliyu *et al* (2022) explored the impact of microfinance bank deposits on Nigeria's agricultural sector performance from 1992 to 2020. The study specifically analyzed trends in agricultural microcredit distribution and agricultural Gross Domestic Product (GDP). Utilizing a quantitative approach, data were sourced from the World Bank and the Central Bank of Nigeria (CBN). Following preliminary diagnostic tests, the study applied ordinary least squares (OLS) regression analysis. Unit root and cointegration tests were conducted to enhance the dataset. The results indicated a positive but statistically insignificant relationship between agricultural GDP and agricultural microcredit. Based on these findings, the study recommended that microfinance banks expand their reach to rural and peri-urban areas with a focus on agriculture. Additionally, regulatory authorities, particularly the CBN, should encourage microfinance banks to extend more loans to agricultural participants. Furthermore, improvements are needed in the consistency and timing of microcredit provision to ensure its effectiveness.

Abubakar (2019) analyzed the relationship between microfinance interest rates and agricultural sector activity in Nigeria from 1999 to 2016 using regression analysis. The findings revealed a strong and significant negative relationship between microfinance interest rates and agricultural activities. Given that microfinance interest rates and monetary policy are not currently the primary tools used by the federal government to enhance agricultural sector performance, the study suggested that more favorable lending interest rates should be implemented alongside increased government spending in the agricultural sector. The negative correlation found in the study confirmed that lower interest rates support agricultural growth, whereas higher interest rates hinder sectoral development. These findings align with existing theoretical frameworks. The study concluded that monetary policy, particularly interest rate adjustments, is an underutilized tool for boosting agricultural productivity. To maximize the benefits of lower interest rates, the government should not only provide reduced-interest loans to farmers but also explore cost-free loan schemes. Additionally, increased investment in agriculture is essential for achieving optimal productivity. The study further recommended that the government pursue a flexible exchange rate policy to enhance capital mobility. A lower exchange rate would encourage capital inflows,

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strengthen the national currency, and make locally produced goods more competitive in global markets, thereby driving growth in the domestic agricultural sector.

Research methodology

This is a quazi experimental research that examined the effect of microfinance bank on agricultural sector performance in Nigeria for thirty-one years starting from 1992 to 2022. The study made use of secondary data sourced from Central Bank of Nigeria (CBN) Statistical Bulletin, index mundi and journals. Data were analysed using Vector Error Correction Model.

Model Specification

The general form of the VECM is:

$\Delta Y_t=\alpha_0+\alpha_1 ECT_{t-1}+ \sum_{i=1}^{p} \beta i \Delta Y_{t-i}+\varepsilon_t$. .....(1)

Where;

ECT_{-1} = Error Correction,

The VECM involving the three variables is presented in its framework as:

$\Delta Co_t= ECT_{(t-1)}+ \sum_{i=1}^{p} \psi_{1,i}\Delta Co_{t-i}+ \sum_{i=1}^{p} \psi_{1,i}\Delta MFL_{t-i}+\sum_{i=1}^{p} \psi_{1,i}\Delta MFD_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFTA_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFINTR_{t-i} +U_t$. .....(2)

$\Delta Fio_t= ECT_{(t-1)}+ \sum_{i=1}^{p} \psi_{1,i}\Delta Fio_{t-i}+ \sum_{i=1}^{p} \psi_{1,i}\Delta MFL_{t-i}+\sum_{i=1}^{p} \psi_{1,i}\Delta MFD_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFTA_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFINTR_{t-i} + U_t$. .....(4)

$\Delta Ao_t= ECT_{(t-1)}+ \sum_{i=1}^{p} \psi_{1,i}\Delta Ao_{t-i}+ \sum_{i=1}^{p} \psi_{1,i}\Delta MFL_{t-i}+\sum_{i=1}^{p} \psi_{1,i}\Delta MFD_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFTA_{t-i} +\sum_{i=1}^{p} \psi_{1,i}\Delta MFINTR_{t-i} + U_t$. .....(5)

Where:

CO= Crop output
FiO = Fisheries output
AO = Agricultural output
MFL = Microfinance Bank Loan
MFD = Microfinance deposit
MFTA = Microfinance total assets
MFINTR = Microfinance Interest Rate
U_t = Error term
Δ = difference operator,
Σ = summation,

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Results

Descriptive Statistics

Table 1: Descriptive statistics of the variables used

Statistics	AO	CO	FIO	MFINTR	MFD	MFL	MFTA
Mean	9951.569	8838.224	208.1768	19.13340	63187.76	31608.01	151199.2
Median	9869.730	8843.400	189.4300	17.87167	37617.70	19650.20	69006.37
Maximum	17958.58	16181.99	379.0600	31.65000	260810.5	81210.00	755549.8
Minimum	3674.790	3044.550	66.49000	15.13583	639.6000	135.8000	967.2000
Std. Dev.	5056.378	4648.442	104.3272	3.561611	72379.21	30861.64	190971.9
Skewness	0.117667	0.098298	0.293055	1.800759	1.159155	0.368568	1.502411
Kurtosis	1.545013	1.539482	1.724671	6.620054	3.399625	1.467105	4.829983
Jarque-Bera	2.534432	2.533724	2.298318	30.42167	6.456635	3.375327	14.44076
Probability	0.281615	0.281714	0.316903	0.000000	0.039624	0.184951	0.000732
Sum	278643.9	247470.3	5828.950	535.7352	1769257.	885024.3	4233579.
Sum Sq. Dev.	6.90E+08	5.83E+08	293872.6	342.4969	1.41E+11	2.57E+10	9.85E+11
Observations	31	31	31	31	31	31	31

Source: Author's Computation from Eviews 10

The findings showed that MFTA had the highest mean (151,199.2) and standard deviation (190,971.9), while the interest rate had the lowest mean (19.13340) and standard deviation (3.561611). Microfinance interest rate and MFTA had the highest kurtosis (6.620054 and 4.829983), indicating peaked distributions, whereas other variables were flatter. All selected variables were positively skewed, suggesting long right-tailed distributions.

Trend Analysis

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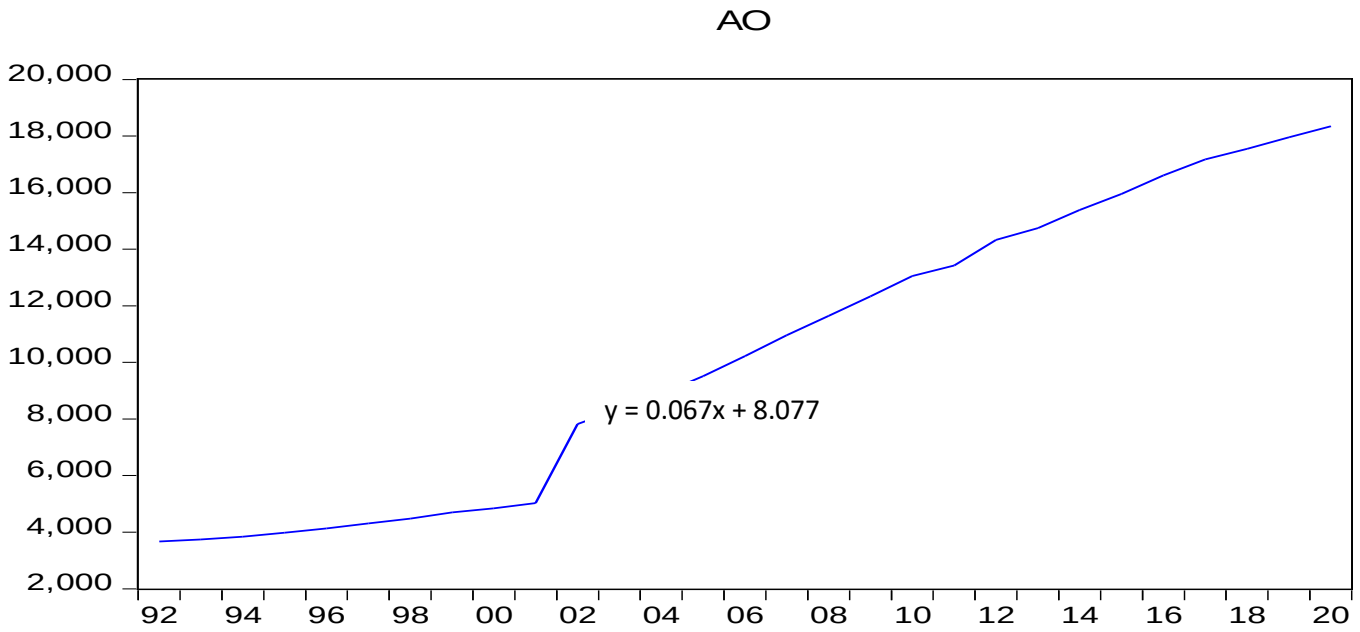

Figure 1: A Line chart showing distribution of Nigeria's agricultural output (AO) (Billion Naira) from 1992– 2020

Figure 1 illustrates the rising trend in agricultural output from 1992 to 2020. The graph reveals a steady increase, reaching its highest point at N18,348.18 billion in 2020, indicating a consistent upward trajectory.

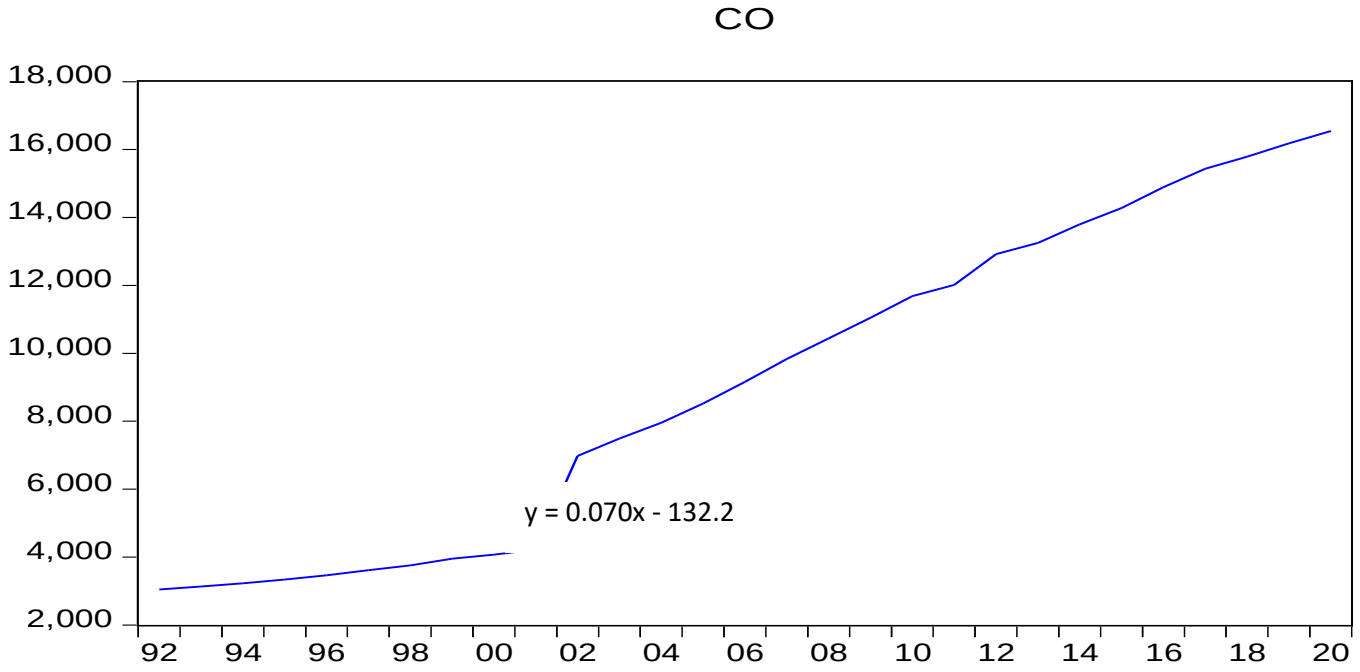

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Figure 2: A Line chart showing distribution of Nigeria's crop output (CO) (Billion Naira) from 1992– 2020

The increasing trend of crop output can be seen in Figure 2. The graph shows that within the period under review (1992 to 2020) crop output increased at an increasing rate and reached its peak of ₦16544.52 billion in 2020. This indicates that crop output exhibits an upward trend.

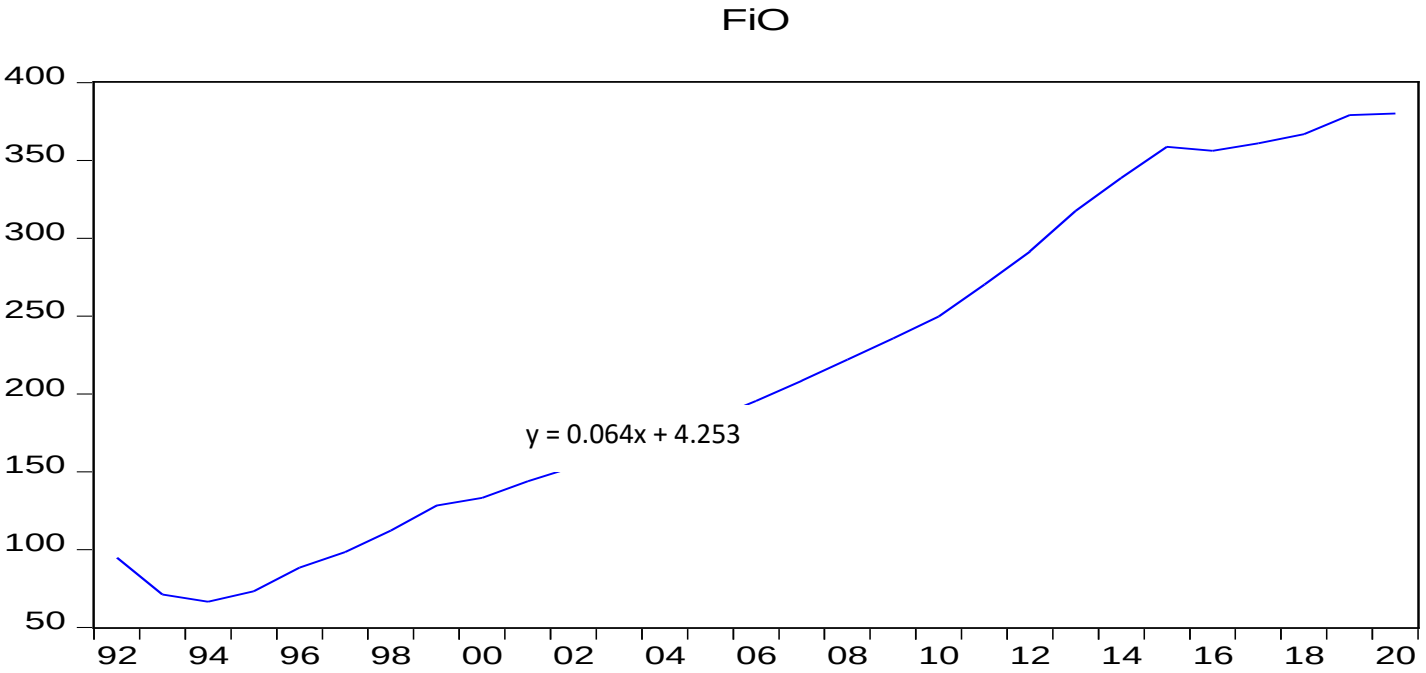

Figure 3: A Line chart showing distribution of Fishery Output (FiO) (Billion Naira) from 1992– 2020

Fishery output (FiO) experienced an increasing trend from ₦94.81 billion in 1992 but the increase was not sustained due to a decrease between 1993 to 1996. Between 1997, it experienced an increasing trend throughout the period under review.

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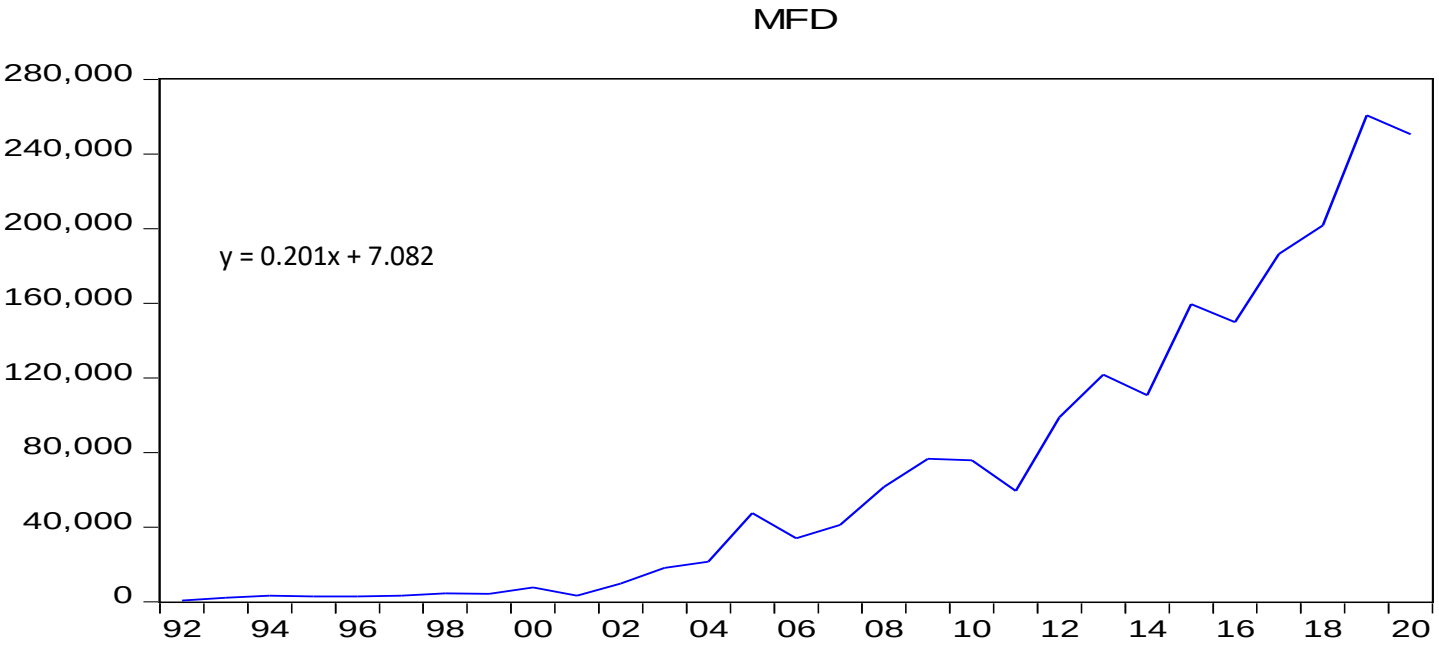

Figure 4: A Line chart showing distribution of Microfinance Bank Deposit (MFD) (Million Naira) from 1992– 2020

Microfinance Bank Deposit (MFD) witnessed a zigzag trend throughout the period under review and reached a peak of ₦260,810.46 million in 2019.

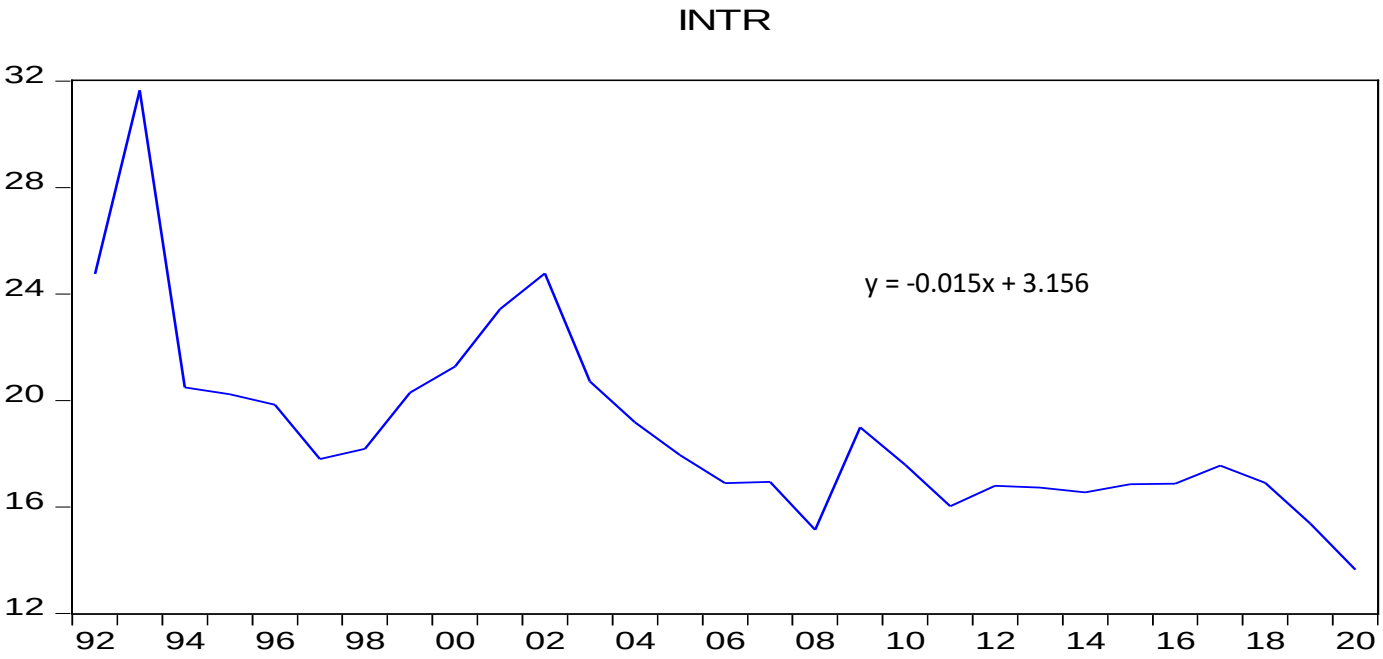

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Figure 5: A Line chart showing distribution of Microfinance Interest Rate (MFINTR) (%) from 1992 – 2020

Microfinance Interest Rate (MFINTR) is generally in a zigzag trend, as seen in Fig. 5. The highest MFINTR of 24.75 percent was reported in the year 1992, according to the data. The zigzag trend in MFINTR is highlighted by the time series data in Appendix 1. According to the data, MFINTR rose in a zigzag pattern from 24.75 percent in 1992 to 13.64 percent in 2020. This suggests that MFINTR was indecisive throughout the study period, with a zigzag pattern. This zigzag trend of microfinance interest rate will discourage most farmers from borrowing since the interest rate is not stable over time and one cannot dictate when it will be very high which will result in decline in the value of money borrowed will ultimately reduce productivity.

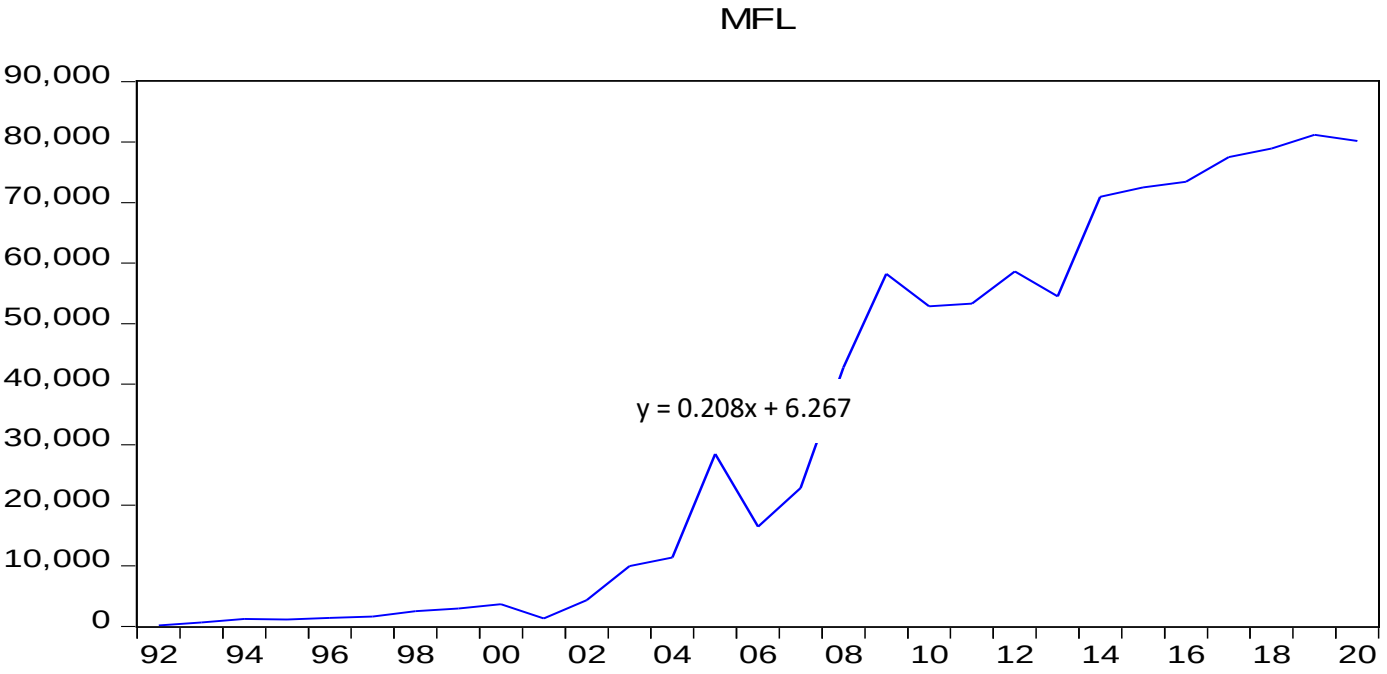

Figure 6: A Line chart showing distribution of Microfinance Bank Loan (MFL) (Million Naira) from 1992– 2020

Figure 6 depicts the graph of Microfinance Loan (MFL) from 1992– 2020. Between 1992 to 2020, MFL increased in an increasing rate and reached its peak in 2020.

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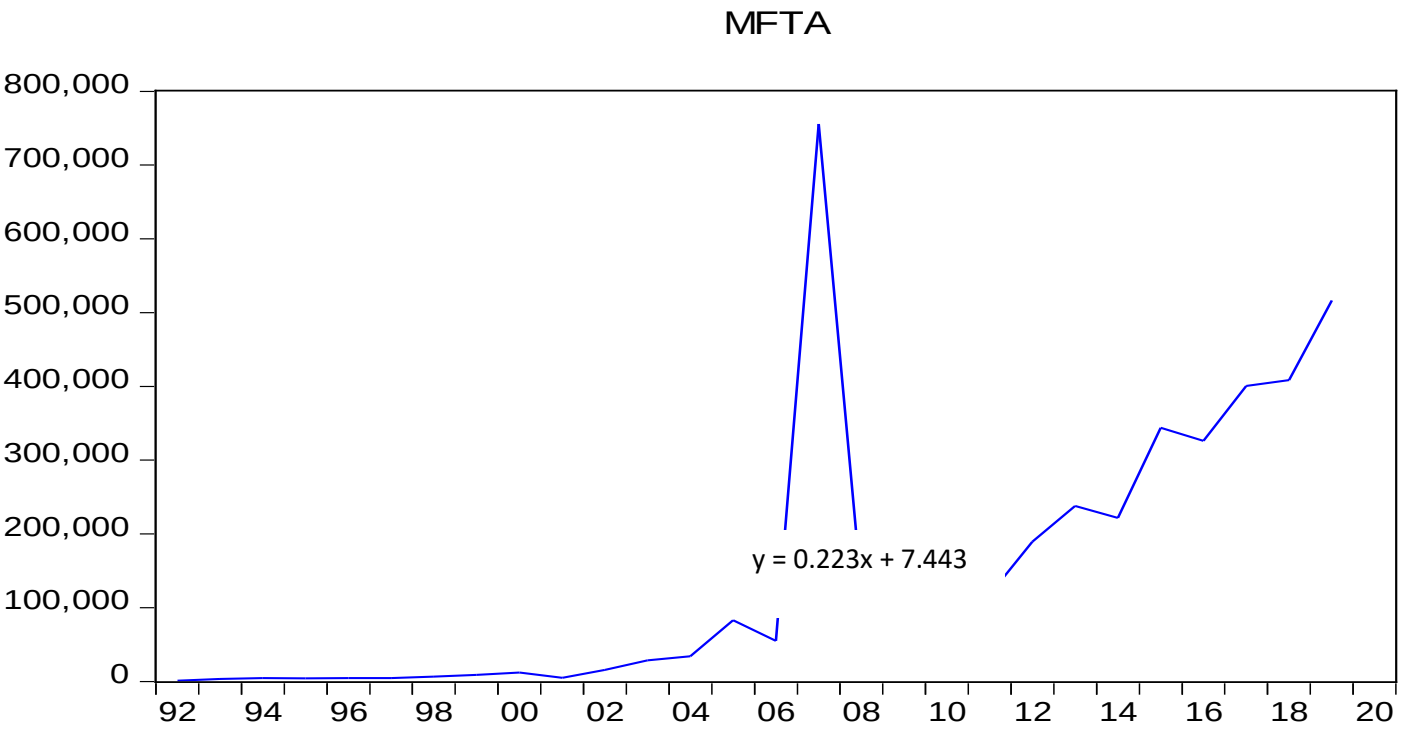

Figure 7: A Line chart showing distribution of Microfinance Bank Total Asset (MFTA) (Million Naira) from 1992–2020

Figure 7 depicts the graph of Microfinance Bank Total Asset (MFTA) from 1992– 2019. Between 1992 to 2020, MFTA increased in an increasing rate and reached its peak in 2020.

Unit root test

The study used Augmented Dickey Fuller (ADF) to test for stationarity in both dependent and independent variables to avoid spurious results.

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Table 2: Unit Root Test Results

Variables	Levels	Critical Values		1st Difference	Critical Values		Remark
		5%	10%		5%	10%	
AO	-0.850241 (0.7887)	-2.971853	-2.625121	-4.848728 (0.0006)	-2.976263	-2.627420	1(1)
CO	-0.901177 (0.7728)	-2.971853	-2.625121	-4.887891 (0.0005)	-2.976263	-2.627420	1(1)
FiO	-0.255545 (0.9197)	-2.971853	-2.625121	-6.847653 (0.0000)	-2.976263	-2.627420	1(1)
MFD	-1.034081 (0.7261)	-2.976263	-2.627420	-7.786558 (0.0000)	-2.976263	-2.627420	1(1)
MFTA	-1.124448 (0.6904)	-2.981038	-2.629906	-9.047495 (0.0000)	-2.981038	-2.629906	1(1)
MFL	-2.713588 (0.0843)	-2.971853	-2.625121	-6.384995 (0.0000)	-2.976263	-2.627420	1(1)
MFINTR	-1.990715 (0.2889)	-2.971853	-2.625121	-7.211877 (0.0000)	-2.976263	-2.627420	1(1)

Source: Author's Computation from E-views 10.

The unit root test conducted and presented in Table 2 indicates that all variables were non-stationary at levels, they were however stationary at the first difference I(1). This allows for the use of the Johansen Co-integration technique (the order of integration is not mixed).

Table 3: Johansen Test for Cointegration

Johansen Test for Cointegration

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.984199	313.9297	159.5297	0.0000	107.8397	52.36261	0.0000
At most 1 *	0.958914	206.0900	125.6154	0.0000	82.99459	46.23142	0.0000
At most 2 *	0.753116	123.0954	95.75366	0.0002	36.36971	40.07757	0.1234
At most 3 *	0.680670	86.72569	69.81889	0.0013	29.67981	33.87687	0.1462
At most 4 *	0.609290	57.04589	47.85613	0.0054	24.43455	27.58434	0.1203
At most 5 *	0.571334	32.61134	29.79707	0.0231	22.02399	21.13162	0.0374
At most 6	0.292723	10.58735	15.49471	0.2382	9.004659	14.26460	0.2858
At most 7	0.059057	1.582688	3.841466	0.2084	1.582688	3.841466	0.2084

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level

Source: Author's Computation from Eviews 10

Table 3 confirms cointegration in the model, as both trace and max-eigenvalue tests exceed critical values, with p-values below 0.05. The results indicate the presence of cointegrating equations.

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Table 4: Vector Error Correction Model (crop output as Dependent Variables)

Cointegrating Eq:	**Coefficient**	**Std. Error**	**t-Statistic**
$LMFINTR_{(-1)}$	-0.652653	0.06860	-9.51386***
$LMFD_{(-1)}$	-0.173440	0.02444	-7.09572***
$LMFL_{(-1)}$	-0.154654	0.01989	-7.77738***
$LMFTA_{(-1)}$	-0.062796	0.01390	-4.51735**
C	-3.146349		
Error Correction:	**Coefficient**	**Std. Error**	**t-Statistic**
Exogenous variables			
ECM	-0.659909	0.45596	-1.44730
$D(LCO_{(-1)})$	1.025681	0.34784	2.94876**
$D(LCO_{(-2)})$	0.365981	0.31417	1.16491
$D(LMFINTR_{(-1)})$	-0.233801	0.39983	-0.58475
$D(LMFINTR_{(-2)})$	-0.169712	0.19647	-0.86381
$D(LMFD_{(-1)})$	-0.082128	0.12712	-0.64605
$D(LMFD_{(-2)})$	0.157760	0.12762	1.23617
$D(LMFL_{(-1)})$	-0.161380	0.10375	-1.55549
$D(LMFL_{(-2)})$	-0.132556	0.11219	-1.18152
$D(LMFTA_{(-1)})$	-0.029107	0.04349	-0.66929
$D(LMFTA_{(-2)})$	0.005319	0.04373	0.12163
R-squared	0.438619		
Adj. R-squared	0.037632		
Sum sq. Resids	0.115729		
S.E. equation	0.090919		
F-statistic	1.093848		

Source: Author's Computation from Eviews 10

Note: * = significant at 10%, ** = significant at 5%, and * = significant at 1%**

The Vector Error Correction Model (VECM) result in Table 4 shows that the estimated model had an R^2 of 0.438 indicating that 43.8% variation in crop output was explained by interest rate, microfinance bank deposit, microfinance bank loan and microfinance bank total asset in the previous year. According to the long and short run results in Table 4, all explanatory variables microfinance interest rate (MFINTR), microfinance bank deposit (MFD), microfinance bank loan (MFL) and microfinance bank total assets (MFTA) significantly affected crop

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output in the long run. Specifically, interest rate had a significant negative (-0.652653) relationship with crop output in the long run, however in the short run, interest rate had no relationship with crop output. The sign is in accordance with economic theory. Rising interest rates raise the cost of borrowing money for farmers, as well as the costs of operations and long-term capital investments, reducing farmer's income. This is consistent with Okidim, e*t al* (2023) findings, which showed a negative relationship between lending interest rates and agriculture output in Nigeria.

Microfinance bank deposit had a significant negative (-0.173440) relationship with crop output in the long run, however in the short run, microfinance bank deposit had no relationship with crop output. This means that as microfinance bank deposit (MFD) increases by one unit, crop output decreases by -0.173440. It was however expected that increase in the amount of deposit can be converted to increase in the available loanable funds which will aid in crop production. This finding disagrees with the findings of Obialor *et al* (2022) who found a positive relationship between microfinance deposit and agricultural sector output in Nigeria.

In the same vein, microfinance bank loan had a significant negative (-0.154654) relationship with crop output in the long run, however in the short run, microfinance bank loan had no relationship with crop output. The implication is that an increase in microfinance bank loan to the sector will result in lower crop output. This outcome may be attributable to a number of reasons unique to Nigeria's economy such as increased corruption among government officials, poor policy execution, a weak institutional framework, and increased poverty among farmers are only a few of these reasons. This negative effect contrasts with Okafor's (2020) study, which found a positive impact of loans to agricultural sector on Nigeria's agricultural sector.

Microfinance bank total assets also had a significant negative (-0.062796) relationship with crop output in the long run, however in the short run, microfinance bank total assets had no relationship with crop output. This implies that an increase in microfinance bank asset (MFA) by 1% will produce a corresponding decrease in crop production by about 0.06% when all other variables in the model are held constant. This finding contradicts the finding of Wachukwu, *et al.* (2021) who found that increase in Microfinance Bank Asset Growth (MFBAG) produces a corresponding increase in (AGP) by about 0.25% Agriculture production contribution to Gross domestic product. Table 4 shows a negative error correction term, though not significant at 5% (t = -1.44730). The coefficient (-0.659) indicates a 65.9% adjustment toward equilibrium per period.

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Effects of Microfinance bank credit, microfinance bank deposit, microfinance bank total asset and microfinance interest rate on fishery output

Table 5: Vector Error Correction Model (Fishery output as Dependent Variables)

Cointegrating Eq:	**Coefficient**	**Std. Error**	**t-Statistic**
$LMFINTR_{(-1)}$	-0.127501	0.29658	-0.42990
$LMFD_{(-1)}$	-0.383107	0.16077	-2.38293**
$LMFL_{(-1)}$	-0.123599	0.10760	-1.14869
$LMFTA_{(-1)}$	0.270982	0.06110	4.43504**
C	-2.429414		
Error Correction: Exogenous variables	**Coefficient**	**Std. Error**	**t-Statistic**
ECM	-0.146465	0.04932	-2.96973**
$D(LFIO_{(-1)})$	0.398379	0.08896	4.47820**
$D(LMFINTR_{(-1)})$	-0.073375	0.05397	-1.35967
$D(LMFD_{(-1)})$	-0.035307	0.03571	-0.98882
$D(LMFL_{(-1)})$	0.001248	0.02931	0.04258
$D(LMFTA_{(-1)})$	0.020225	0.01163	1.73867
C	0.045360	0.00945	4.79823**
R-squared	0.676028		
Adj. R-squared	0.573721		
Sum sq. Resids	0.018975		
S.E. equation	0.031602		
F-statistic	6.607845		

Source: Author's Computation from Eviews 10

Note: * = significant at 10%, ** = significant at 5%, and * = significant at 1%**

The coefficient of determination (R^2) measures the proportion of the variation in fishery output as explained by microfinance bank deposit, microfinance bank loan, microfinance bank total assets and microfinance interest rate. The R^2 for Nigeria fishery output in Table 5 was 0. 676. This implies that the explanatory variables; microfinance bank deposit, microfinance bank loan, microfinance bank total assets and microfinance interest rate explain about 67.6% of the total variations in the dependent variable (fishery output).

According to the long and short run results in Table 5, in the long run and short run, only microfinance bank deposit (MFD) and microfinance bank total assets (MFTA) significantly affected fishery output in the long run.

Microfinance bank deposit had a significant negative (-0.383107) relationship with fishery output in the long run, however in the short run, microfinance bank deposit had

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no relationship with fishery output. This implies that microfinance bank deposit does not substantially influence fishery output. This can be linked to the fact that small-scale farmers who produce mostly for domestic consumption or local markets and whose production activities are primarily subsistence in nature may not have access to microfinanceloans since most of themare not bankable and as such the loan may not have much impact on the business. This finding agrees with the finding of Amakor (2022) who found that microfinance credit has no significant effect on total fishery output.

In the same vein, microfinance bank total assets also had a significant positive (0.270982) relationship with fishery output in the long run, however in the short run, microfinance bank total assets had no relationship with fishery output. This finding is in consonance with the finding of Wachukwu, *et al.* (2021) who found that increase in Microfinance Bank Asset Growth (MFBAG) produces a corresponding increase in agricultural output by about 0.25%.

The error correction as shown in short-run result in Table 5 shows that the error correction term was negative (correctly signed) and significant at 5% level of significance (t = -2.96973). The result implied that the previous period's deviation from long-run equilibrium was corrected in the subsequent period at 14.6% speed of adjustment.

Effects of microfinance credit, microfinance bank deposit, microfinance bank total asset and microfinance interest rate on Agricultural output

Table 6: Vector Error Correction Model (agricultural output as Dependent Variables)

Cointegrating Eq:	**Coefficient**	**Std. Error**	**t-Statistic**
$LMFINTR_{(-1)}$	-0.561731	0.06482	-8.66606***
$LMFD_{(-1)}$	-0.219535	0.02334	-9.40745***
$LMFL_{(-1)}$	-0.113118	0.01905	-5.93665***
$LMFTA_{(-1)}$	-0.038481	0.01323	-2.90791**
C	-3.738708		
Error Correction: Exogenous Variables	**Coefficient**	**Std. Error**	**t-Statistic**
ECM	-0.596926	0.44325	-1.34670
$D(LAO_{(-1)})$	0.980689	0.32666	3.00220**
$D(LAO_{(-2)})$	0.358982	0.31221	1.14980
$D(LMFINTR_{(-1)})$	-0.165443	0.33880)	-0.48832
$D(LMFINTR_{(-2)})$	-0.115580	0.16275	-0.71015
$D(LMFD_{(-1)})$	-0.093188	0.12068	-0.77218
$D(LMFD_{(-2)})$	0.123324	0.11395	1.08225
$D(LMFL_{(-1)})$	-0.127227	0.08836	-1.43980
$D(LMFL_{(-2)})$	-0.106976	0.09775	-1.09440
$D(LMFTA_{(-1)})$	-0.019209	0.03676	-0.52262
$D(LMFTA_{(-2)})$	0.006293	0.03851	0.16341
R-squared	0.422280		
Adj. R-squared	0.009623		

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Sum sq. Resids	0.090408
S.E. equation	0.080360
F-statistic	1.023321

Source: Author's Computation from Eviews 10

Note: * = significant at 10%, ** = significant at 5%, and * = significant at 1%**

The VECM result in table 6 shows that the coefficient of determination was 0.422280, meaning that the model could account for around 42.2% of the variation in agricultural output over the study period. Results further showed that all explanatory variables (microfinance interest rate (MFINTR), microfinance bank deposit (MFD), microfinance bank loan (MFL) and microfinance bank total assets (MFTA) significantly affected agricultural output in the long run while none significantly affected agricultural output in the short run.

Explicitly, interest rate had a significant negative (-0.561731) relationship with agricultural output in the long run, however in the short run, interest rate had no relationship with agricultural output. The sign is in accordance with *apriori* expectation. This finding is consistent with Tuaneh and Nmegbu (2021) who found a negative relationship between interest rate and agricultural output in Nigeria.

Microfinance bank deposit had a significant negative (-0.219535) relationship with agricultural output in the long run, however in the short run, microfinance bank deposit had no relationship with agricultural output. This implies that an increase in the value of microfinance bank deposit (MFD) by one unit will lead to a decrease in agricultural output by -0.219535. This finding disagrees with the findings of Obialor, Ibe and Egungwu (2022) who found a positive relationship between microfinance deposit and agricultural sector output in Nigeria.

In the same vein, microfinance bank loan had a significant negative (-0.113118) relationship with agricultural output in the long run, however in the short run, microfinance bank loan had no relationship with agricultural output. This outcome may be attributable to a number of reasons some of which are diversion of loans to other sectors other than agriculture. This negative effect collaborates the finding of Obialor, Ibe and Egungwu (2022) who found that microfinance loan had negative effect on agricultural sector output in Nigeria.

Microfinance bank total assets also had a significant negative (-0.038481) relationship with agricultural output in the long run, however in the short run, microfinance bank total assets had no relationship with agricultural output. This implies that an increase in microfinance bank asset (MFA) by 1% will produce a corresponding decrease in agricultural production by about 0.03% *ceteris paribus*.

The error correction result in Table 8 shows that the error correction term was correctly signed (negative) and was not statistically significant at 5% level of significance (t = -1.34670). The error correction coefficient of -0.596 showed that the previous period's deviation from long run equilibrium was corrected in the current period at an adjustment speed of 59.6%.

Conclusion and Recommendations

Based on the results and findings of this study, it is concluded that microfinance variables were significant in driving agricultural growth in Nigeria. The study showed that that there was similarity in the way output of different sub-sectors responded to microfinance variables. Microfinance bank loan, microfinance bank deposit and microfinance bank total assets had negative relationship with crop output and agricultural output while microfinance bank total assets had positive significant relationship with, fishery output. In the short run, the effect

of microfinance variables were found to be insignificant in all cases.

Based on the findings from this study the following recommendations were made;

i. From the result of this research, it is evident that the microfinance bank deposit negatively affected the growth of the Nigerian agricultural sector; it is therefore recommended that deposit mobilization should be encouraged and funds generated channeled to agriculture.

ii. Since microfinance bank assets was positive and significant in influencing fishery output, the government should channel more assets into fishery production to improve its so that its effects.

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