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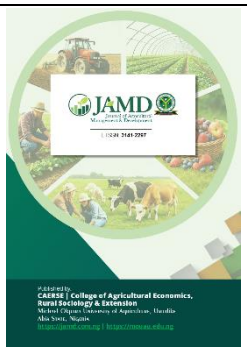

Financial Inflows and Agricultural Value Addition in Nigeria: The Credit Paradox and the FDI Promise

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ABSTRACT

Agriculture is central to Nigeria's economy, yet its transformative potential is constrained by low value addition, with most produce exported or consumed raw. Financial inflows, particularly agricultural credit and foreign direct investment (FDI), are presumed to catalyze agro-processing, but empirical evidence on their effectiveness remains contested. Objective: This study investigates the impact of agricultural credit (AGR-CRED) and foreign direct investment (FDI) on agricultural value addition (VA-AGR) in Nigeria from 1991 to 2023. Using time-series data from FAOSTAT, the study employs an Autoregressive Distributed Lag (ARDL) bounds testing approach to examine the long-run and short-run relationships. Preliminary tests for stationarity (ADF, KPSS) and model diagnostics (autocorrelation, heteroskedasticity) were conducted to ensure robust inference. The ARDL model confirms a long-run cointegrating relationship among the variables. Findings reveal a paradox: agricultural credit has a statistically significant negative effect on value addition in the long run, suggesting systemic inefficiencies in credit utilization. Conversely, FDI has a positive and significant impact, indicating its potential when channeled effectively into agro-processing. The study concludes that the volume of agricultural credit is less critical than the efficiency of its utilization. Policy should prioritize redirecting FDI towards processing infrastructure and establishing agro-industrial clusters to create a more conducive ecosystem for value addition.

Introduction

Agriculture remains a pivotal sector in Nigeria, contributing approximately 25% to GDP and employing over 70% of the rural population (World Bank, 2021). However, the sector is dominated by subsistence farming with limited processing capabilities. This lack of transformation from primary production to value-added agro-industrial outputs undermines Nigeria's economic diversification goals (Iheke et al., 2016). The country faces a critical paradox: while it is a major producer of crops like cassava and yams, it imports large volumes of processed food items, highlighting a substantial gap in its agro-processing sector (NBS, 2020).

In response, Nigeria has implemented various policy interventions, including the Anchor Borrowers' Programme (ABP), the Agro-Processing, Productivity Enhancement and Livelihood Support Programme (APPEALS), and the Special Agro-Industrial Processing Zones (SAPZs). These initiatives are underpinned by a key assumption: increased financial inflows, specifically agricultural credit (AGR-CRED) and foreign direct investment (FDI), will stimulate value-adding activities. Agricultural credit is theorized to facilitate investment in processing equipment

and modern technology (Olagunju & Ajiboye, 2010), while FDI is expected to bring capital, technology, and global market linkages (UNCTAD, 2023).

Despite these efforts and assumptions, the contribution of agricultural value addition (VA-AGR) to GDP remains limited. The empirical link between financial inflows and value addition outcomes is under-explored and often contradictory. Studies suggest that agricultural credit is frequently underutilized or diverted to non-agricultural uses (Afolabi, 2010), and FDI tends to concentrate on primary production rather than processing (Ogbanje & Salami, 2022). This gap between policy intent and outcome signals a critical need for a rigorous, data-driven analysis. This study aims to empirically investigate the impact of agricultural credit and foreign direct investment on agricultural value addition in Nigeria over the period 1991-2023, employing robust time-series econometric techniques to provide reliable evidence for policy formulation.

Methodology

Data Source and Description

This study utilized annual time-series data from 1991 to 2023 sourced from the Food and Agricultural Organization Statistics (FAOSTAT) database. The variables include:

- VA-AGR (Dependent Variable): Value Addition in Agriculture (Million ₦).
- GDP: Gross Domestic Product (Million ₦).
- AGR-CRED: Agricultural Credit (Million ₦).
- FDI-AGR: Foreign Direct Investment in Agriculture (Million USD).
- Gross National Income (GNI) was initially considered but was excluded from the final model due to severe multicollinearity with GDP.

Model Specification and Econometric Framework

To address the time-series properties of the data and establish both short-run and long-run relationships, the study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach developed by Pesaran et al. (2001). This technique is preferred over traditional cointegration methods (e.g., Johansen) as it is applicable regardless of whether the variables are I(0) or I(1), making it suitable for small sample sizes. The model is specified as:

$$\Delta \ln\text{VA-AGR}_t = \alpha_0 + \Sigma_{i=1}^{p}\beta_i \Delta \ln\text{VA-AGR}_{t-i} + \Sigma_{i=0}^{q}\gamma_i \Delta \ln\text{GDP}_{t-i} + \Sigma_{i=0}^{r}\delta_i \Delta \ln\text{AGR-CRED}_{t-i} + \Sigma_{i=0}^{s}\varphi_i \Delta \ln\text{FDI-AGR}_{t-i} + \theta_1 \ln\text{VA-AGR}_{t-1} + \theta_2 \ln\text{GDP}_{t-1} + \theta_3 \ln\text{AGR-CRED}_{t-1} + \theta_4 \ln\text{FDI-AGR}_{t-1} + \varepsilon_t$$

where Δ is the first difference operator, capturing short-run dynamics. The model includes an intercept term (α_0), lagged differences of the dependent variable up to order p, and current and lagged differences of the independent variables (lnGDP, lnAGR-CRED, lnFDI-AGR) with lag lengths q, r, and s, respectively. The long-run relationship is captured by the lagged level terms ($\ln\text{VA-AGR}_{t-1}$, $\ln\text{GDP}_{t-1}$, $\ln\text{AGR-CRED}_{t-1}$, $\ln\text{FDI-AGR}_{t-1}$) with coefficients θ_1 through θ_4, and ε_t is the error term. An F-test is used to determine the presence of a long-run relationship (cointegration) by testing the null hypothesis H_0: $\theta_1 = \theta_2 = \theta_3 = \theta_4 = 0$. If cointegration is established, the long-run and short-run (error correction model) coefficients are estimated.

Preliminary Tests

Before estimation, the series were tested for stationarity using the Augmented Dickey-Fuller (ADF) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to ensure no variable is I(2), a condition for using ARDL. The result is presented in Table 1. From the Augmented Dickey-Fuller (ADF) test, at level, all variables have p-values > 0.05, indicating failure to reject the null hypothesis of a unit root (non-stationarity). After first differencing, all variables become stationary at the 1% significance level ($p < 0.01$).

At level, the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test statistics for all variables exceed the critical values, rejecting the null hypothesis of stationarity. After first differencing, the test statistics fall below the critical values, indicating that all variables are stationary. All variables are integrated of order one, I(1). No variable is I(2), satisfying the pre-condition for the ARDL bounds testing approach.

Results and Discussion

Stationarity and Cointegration

The ADF and KPSS tests indicate that all variables are integrated of order I(1), fulfilling the pre-condition for the ARDL model. The computed F-statistic for the bounds test (7.93) exceeds the upper critical bound at the 1% significance level, confirming the existence of a long-run cointegrating relationship among the

variables. This validates the use of the ARDL framework for analyzing the dynamics between external inflows and value addition.

Long-run and Short-run Dynamics
The results of the ARDL model are presented in Table 2. The model diagnostics confirm the absence of serial correlation (Durbin-Watson = 1.92) and heteroskedasticity (Breusch-Pagan p = 0.38), and the CUSUM and CUSUMQ tests confirm structural stability.

The long-run results reveal a statistically significant negative relationship between agricultural credit (AGR-CRED) and value addition (VA-AGR). A 1% increase in agricultural credit is associated with a 0.21% *decrease* in agricultural value addition in the long run. This suggests that credit programs may not be efficiently targeted toward processing and value-adding activities.

Conversely, FDI in agriculture has a positive and significant long-run impact on VA-AGR. A 1% increase in FDI leads to a 0.10% increase in value addition. This effect is smaller but more immediate in the short run (0.06% elasticity). GDP also shows a significant positive effect in both the short and long run. The Error Correction Term (ECM) coefficient of -0.527 is highly significant, indicating that approximately 53% of any disequilibrium from the long-run relationship is corrected within one year, confirming a stable and convergent dynamic process.

The findings of this study provide a nuanced understanding of how financial inflows interact with agricultural value addition in Nigeria. The most striking result is the persistent negative effect of agricultural credit on value addition, a finding that aligns with prior qualitative assessments (Eze *et al.*, 2021; Afolabi, 2010). This paradox can be explained by several factors: credit is often diverted to consumption or non-agricultural uses, a lack of complementary technical support leads to underutilization of funds for processing equipment, and the potential politicization of fund allocation may result in funds reaching farmers without the capacity or intent to engage in value-adding activities (CBN, 2022).

In contrast, the positive and significant impact of FDI offers a more optimistic, yet cautious, picture. The modest magnitude of its effect supports the suspicion that FDI remains concentrated in primary production or export-oriented commodities, with limited spillover into local processing. The positive coefficient, however, validates the theoretical expectation that FDI can be a conduit for capital and technology. This suggests that recent initiatives like the SAPZs, which aim to create a more attractive and organized environment for agro-industrial investment, are moving in the right direction.

Finally, the significant positive effect of GDP on value addition underscores the importance of overall economic growth in enabling agricultural transformation. However, this effect is not automatic; it depends on the nature of growth and its linkages to the agricultural sector. The ARDL framework used in this study provides a more reliable estimate of these relationships compared to the simple OLS approach, correcting for autocorrelation and establishing causality through the cointegration framework.

Conclusion and Recommendations
This study provides robust empirical evidence on the divergent impacts of external financial inflows on agricultural value addition in Nigeria. While FDI shows a positive, albeit modest, contribution, agricultural credit paradoxically exhibits a negative long-run effect, pointing to deep-rooted inefficiencies in its allocation and utilization. The key policy conclusion is that increasing the volume of agricultural credit without addressing systemic inefficiencies is counterproductive.

Based on these findings, the following targeted policy interventions are recommended:

1. Restructure Agricultural Credit: The focus must shift from disbursement volume to efficiency. This involves:
    - Implementing a "monitoring and technical assistance" framework where credit is tied to specific, verifiable investments in processing technologies.
    - Developing credit products specifically for agro-processing SMEs, rather than general-purpose agricultural loans.
    - Strengthening the capacity of institutions like NIRSAL to provide risk assessment and post-disbursement monitoring.
2. Incentivize FDI for Agro-processing: To maximize the positive impact of FDI, the government should introduce a tiered incentive system. Investors who commit to establishing processing facilities beyond primary production should receive significant tax breaks, streamlined land access, and infrastructure support. The SAPZs provide the perfect vehicle for this targeted approach.
3. Develop Agro-Industrial Clusters: The development of industrial parks should be accelerated and strategically located near major production clusters. These clusters should be designed as one-stop-shops

with shared infrastructure for processing, cold storage, quality testing, and logistics. This model reduces post-harvest losses and creates economies of scale, making value addition more viable for small and medium-scale processors.

Limitations and Future Research

While this study provides a robust macro-level analysis, it does not capture the heterogeneity of effects across different crop value chains or regions. Future research should employ firm-level data or sectoral case studies to understand the micro-dynamics of credit use and the specific pathways through which FDI contributes to value addition. Additionally, exploring the role of complementary factors like infrastructure and market access in moderating the impact of financial inflows would be a valuable extension.

References

Afolabi, J. A. (2010). Analysis of loan repayment among small-scale farmers in Oyo State, Nigeria. *Journal of Social Sciences*, 22(2), 115–119.

Central Bank of Nigeria (CBN). (2022). *Annual Report 2022*.

Eze, C. C., Ibekwe, U. C., & Nwajiuba, C. U. (2021). Effect of credit access on value addition in Nigerian agriculture. *Nigerian Journal of Agricultural Economics*, 12(1), 21–29.

Food and Agricultural Organization Statistics (FAOSTAT). *Database*. Accessed 10th April, 2025.

Iheke, O. R., Onyemauwa, C. S., & Onu, J. I. (2016). Agro-processing for rural transformation in Nigeria. *International Journal of Agricultural Economics and Rural Development*, 9(1), 90–97.

National Bureau of Statistics (NBS). (2020). Nigerian Gross Domestic Product Report Q4 & full-year 2020.

Ogbanje, E. C., & Salami, A. O. (2022). Impact of Foreign Direct Investment on Nigeria's Agricultural Sector (1981 to 2019). *International Journal of Environment, Agriculture and Biotechnology*, 7(4), 25–33.

Olagunju, F. I., & Ajiboye, A. (2010). Agricultural lending practices and agricultural productivity in Nigeria. *Journal of Agricultural Extension*, 14(1), 65–76.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. https://doi.org/10.1002/jae.616

UNCTAD. (2023). *World Investment Report 2023: Investing in sustainable energy for all*.

World Bank. (2021). *Nigeria: Country Agricultural Sector Risk Assessment*.

Appendix

Table 1: Stationarity Test Results (ADF and KPSS)

Variable	Level	First Difference	Decision		
	ADF	**KPSS**	**ADF**	**KPSS**	
lnVA-AGR	-1.842 (0.662)	0.762***	-5.431*** (0.000)	0.124	I(1)
lnGDP	-1.253 (0.890)	0.841***	-6.214*** (0.000)	0.098	I(1)
lnAGR-CRED	-0.976 (0.938)	0.913***	-7.103*** (0.000)	0.087	I(1)
lnFDI-AGR	-2.813 (0.198)	0.521**	-8.457*** (0.000)	0.065	I(1)

*Notes: *** and * *indicate significance at the 1%, 5%, and 10% levels, respectively. For the Augmented Dickey-Fuller (ADF) test, values in parentheses are p-values; the null hypothesis is that the series has a unit root (non-stationary). Rejection of the null hypothesis indicates stationarity. For the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test, the null hypothesis is stationarity; the test statistic is reported, with asterisks indicating rejection of the null hypothesis at the respective significance levels. Critical values for the KPSS test (with trend) are 0.739 (1%), 0.216 (5%), and 0.146 (10%). ADF test specifications (intercept and/or trend) and lag lengths were selected based on the Akaike Information Criterion (AIC).*

Table 2: ARDL Long-Run and Short-Run Estimates for Agricultural Value Addition

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Long-run Coefficients				
lnGDP	0.425***	0.058	7.327	0.000
lnAGR-CRED	-0.212**	0.085	-2.494	0.018
lnFDI-AGR	0.096***	0.021	4.571	0.000
Short-run Coefficients (ECM)				
ΔlnGDP	0.311**	0.123	2.528	0.017
ΔlnAGR-CRED	-0.104	0.071	-1.465	0.153
ΔlnFDI-AGR	0.058**	0.022	2.636	0.013
ECM(-1)	-0.527***	0.092	-5.728	0.000
Constant	0.082**	0.036	2.277	0.030
Diagnostics				
R-squared	0.71			
F-statistic (Bounds)	7.93***			
Durbin-Watson	1.92			

*Notes: **, *** indicate significance at 5% and 1% levels, respectively. *Optimal lag order (1, 2, 1, 0) selected based on Akaike Information Criterion (AIC).