

BENCHMARKING PERFORMANCE BETWEEN MICROCREDIT USERS AND NON-USERS AMONG CASSAVA PROCESSORS IN SOUTH-EAST NIGERIA

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ABSTRACT

Microcredit is widely promoted as a catalyst for improving enterprise performance among small-scale processors in developing economies. This study benchmarks the performance of cassava processors with and without access to microcredit in South-East Nigeria, focusing on profitability, capacity utilization, and enterprise efficiency. A multistage sampling procedure was used to select 155 processors across Abia, Ebonyi, and Imo States. Cross-sectional data were collected using structured questionnaires, covering socio-economic characteristics, production inputs, outputs, and credit use. Data analysis employed descriptive statistics, gross margin analysis, and a two-stage least squares (2SLS) regression model to correct for endogeneity in credit-performance relationships. Findings reveal significant performance differentials between microcredit users and non-users. Processors with microcredit access achieved higher output levels, better capacity utilization, and superior gross margins. The 2SLS estimates confirmed that microcredit exerts a positive and statistically significant effect on enterprise profitability and operational efficiency, with R^2 values exceeding 0.96 for both supply and demand functions. Moreover, credit users demonstrated greater adoption of improved processing technologies and stronger market participation, while non-users remained constrained by working capital shortages, limited scale, and reduced competitiveness. These results highlight the pivotal role of microcredit in enhancing enterprise outcomes and strengthening the cassava value chain in South-East Nigeria. Policy directions point to expanding affordable credit access through initiatives such as the Anchor Borrowers' Programme and NIRSAL guarantees, alongside removing structural barriers to effective utilization. Strengthened microcredit interventions could foster enterprise growth, raise rural incomes, and accelerate Nigeria's agricultural transformation.

INTRODUCTION

Microcredit has been widely advocated as a tool for improving enterprise performance, particularly in small-scale agribusinesses and processing ventures across developing economies (Yunus, 2003; Armendáriz & Morduch, 2010). Originating from the Grameen model in Bangladesh, the concept of extending small loans to credit-constrained entrepreneurs has since evolved into a globally

recognized strategy for fostering financial inclusion, reducing poverty, and enhancing enterprise growth (Morduch, 1999; Hermes & Lensink, 2007). Within Sub-Saharan Africa, where agriculture remains the primary livelihood for the majority, access to affordable credit has been consistently highlighted as a binding constraint to productivity and profitability (Zeller & Sharma, 2000; Simtowe & Zeller, 2006; Khandker & Samad, 2014).

In Nigeria, microcredit schemes have become integral to agricultural development initiatives, especially with the rise of programs such as the Central Bank's Anchor Borrowers' Programme and the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) (CBN, 2020; NIRSAL, 2021). Evidence suggests that microcredit participation enhances farmers' adoption of improved technologies, market access, and income stability (Ogunleye, 2018; Adebisi, Zannu, & Alaka, 2023; Ogebe, Ali, & Olagunju, 2025). However, concerns persist about repayment risks, diversion of loans, and the uneven performance outcomes across borrowers and non-borrowers (Gates, 2014; Adenike, 2018; Biala & Galadima, 2025).

From a theoretical standpoint, the microcredit-performance nexus is grounded in financial intermediation theory (Gurley & Shaw, 1960), credit market imperfections (Stiglitz & Weiss, 1981), and the household production framework (Becker, 1965). These theories suggest that access to credit can alleviate liquidity constraints, enabling firms to invest in productive assets, expand operations, and optimize capacity utilization (Besley, 1995; Conning & Udry, 2007). Applied studies in South Asia and Africa confirm that credit access is strongly associated with higher enterprise profitability, reduced inefficiency, and increased competitiveness (Pitt & Khandker, 1998; Diagne & Zeller, 2001; Awunyo-Vitor, 2012; Banerjee et al., 2015). Conversely, other empirical findings highlight limited or mixed impacts, raising debates over whether microcredit truly transforms enterprise outcomes or merely sustains subsistence-level operations (Coleman, 1999; Roodman & Morduch, 2014; Bateman, 2015).

In Nigeria's cassava sector, the issue is particularly pressing. Cassava remains a dominant staple and industrial crop with significant value chain opportunities in processing for starch, flour, chips, and ethanol (FAO, 2020; Ezedinma et al., 2019). Despite its potential, cassava processors often operate at sub-

optimal capacity due to poor financing, high input costs, and market inefficiencies (Nweke, 2004; Phillip et al., 2013). While some studies have examined credit and productivity among farmers (Oluwasola & Alimi, 2008; Olomola & Gyimah-Brempong, 2014), relatively fewer have benchmarked enterprise-level performance between microcredit users and non-users in cassava processing, especially within South-East Nigeria.

Against this backdrop, this study benchmarks the performance of cassava processors with and without microcredit access, focusing on profitability, capacity utilization, and enterprise efficiency. By applying a two-stage least squares (2SLS) model to correct for endogeneity in credit–performance relationships, it provides empirical insights into whether microcredit enhances processing efficiency and competitiveness. In doing so, the study contributes to the ongoing debates in microfinance literature while offering policy-relevant evidence to strengthen Nigeria’s agricultural finance strategies.

MATERIALS AND METHODS

The study was conducted in three states of South-East Nigeria—Abia, Ebonyi, and Imo—where cassava production and processing are dominant livelihood activities. The region lies between latitude 5°29’ and 6°20’N and longitude 7°01’ and 8°06’E, covering a total land area of approximately 10.95 million hectares. The area is characterized by a tropical rainforest climate with annual rainfall between 1,500 and 2,500 mm, supporting intensive cassava cultivation and diverse processing enterprises (Nweke, 2004; FAO, 2020). Cassava processing activities in this zone include the production of gari, fufu, starch, and high-quality cassava flour, which are critical both for household consumption and industrial markets (Phillip et al., 2013; Ezedinma et al., 2019).

Sampling Procedure and Data Collection

A multistage sampling procedure was adopted. In the first stage, the three states were purposively selected for their prominence in cassava production and processing (Olomola & Gyimah-Brempong, 2014). In the second stage, major cassava processing clusters were identified within each state. Finally, a random sample of 155 processors was drawn proportionately

across the states. Primary data were collected through structured questionnaires and direct interviews, focusing on socio-economic characteristics, input use, output levels, microcredit participation, and enterprise performance indicators (Oluwasola & Alimi, 2008; Ogunleye, 2018).

Analytical Techniques

Data were analyzed using a combination of descriptive and econometric methods. Descriptive statistics such as means, frequencies, and percentages provided baseline comparisons of credit users and non-users. Enterprise profitability was assessed using gross margin analysis, widely applied in agricultural economics to measure returns over variable costs (Diagne & Zeller, 2001; Awunyo-Vitor, 2012).

To address endogeneity in the relationship between microcredit access and enterprise performance, the study employed the two-stage least squares (2SLS) regression model. This approach corrects for simultaneity bias in credit demand and supply equations (Morduch, 1999; Stiglitz & Weiss, 1981). The specification captured enterprise profitability, capacity utilization, and efficiency as dependent variables, with credit use, socio-economic factors, and processing inputs as explanatory variables. The model choice is consistent with prior empirical work assessing credit impacts in developing-country agriculture (Conning & Udry, 2007; Pitt & Khandker, 1998).

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Cassava Processors

Table 1 summarizes the socio-economic characteristics of the 155 cassava processors surveyed in Abia, Ebonyi, and Imo States. The average age of respondents was 42 years, with female processors constituting 64% of the sample, reflecting the gendered nature of cassava processing in Nigeria (Nweke, 2004; FAO, 2020). Average years of processing experience stood at 12, while mean household size was six persons, consistent with earlier findings that larger households provide family labor in small-scale agribusinesses (Olomola & Gyimah-Brempong, 2014).

Table 1: Socio-Economic Characteristics of Cassava Processors

Variable	Mean (Users)	Mean (Non-Users)	t-value
Age (years)	41.2	42.8	-0.75
Household size	6.4	5.9	1.10
Processing experience (years)	13.1	11.2	2.15**
Education (years)	9.5	7.2	3.05***
Gender (% female)	62.5	65.2	-0.44

*Note: **p < 0.05; ***p < 0.01.

Microcredit users generally had higher education levels and more years of experience, factors that likely improve financial literacy and loan repayment capacity (Awunyo-Vitor, 2012; Ogunleye, 2018).

Gross Margin Analysis of Microcredit Users and Non-Users

Profitability, a critical measure of enterprise performance, was examined through gross margin analysis. Results presented in Table 2 reveal that cassava processors with access to microcredit realized

an average **gross margin of ₦138,500 per annum**, compared to **₦95,200** among non-users. This difference was statistically significant, underscoring the positive role of microcredit in enhancing enterprise viability.

Table 2: Gross Margin Analysis of Cassava Processing Enterprises

Category	Gross Revenue (₦)	Variable Costs (₦)	Gross Margin (₦)
Microcredit Users	310,400	171,900	138,500
Non-Users	252,700	157,500	95,200

The profitability advantage among credit users reflects their improved ability to mobilize working capital, which allowed them to purchase larger volumes of cassava roots, diversify raw material sourcing, and invest in improved processing technologies. This finding is consistent with Ezedinma et al. (2019), who reported that financial access enables cassava enterprises to scale operations, and with Diagne and Zeller (2001), who highlighted the pivotal role of rural finance in overcoming liquidity constraints.

The evidence also resonates with earlier microfinance literature. Pitt and Khandker (1998) demonstrated that access to credit significantly improves enterprise profitability by enabling risk management and enhancing productive investment. Similarly, Banerjee et al. (2015) found that targeted microfinance interventions enhance business outcomes by reducing

reliance on informal, high-cost borrowing. In the Nigerian context, these results suggest that microcredit has a transformative effect by bridging capital gaps that would otherwise constrain profitability and growth.

Beyond financial returns, higher gross margins among credit users also point to broader economic implications. Improved profitability strengthens household income, fosters reinvestment in processing activities, and enhances rural livelihoods. Non-users, however, remained limited by smaller procurement volumes, higher unit input costs, and lower economies of scale, thereby reducing their competitiveness. As emphasized by Morduch (1999) and Hermes and Lensink (2007), such disparities illustrate the dual role of microcredit as both a financial instrument and a catalyst for inclusive enterprise development. **Figure 1** below illustrates the profitability differential.

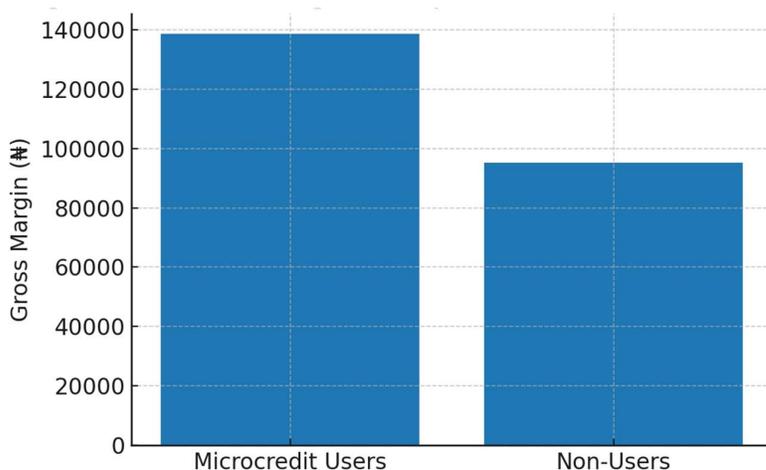


Figure 1. Comparative gross margins of microcredit users and non-users among cassava processors.

3.3 Capacity Utilization of Processing Enterprises

Capacity utilization, defined as the ratio of actual output to installed processing capacity, provides an important indicator of the efficiency and sustainability

of cassava enterprises. Results presented in Figure 2 show that processors with access to microcredit achieved an average utilization rate of **71%**, compared with **55%** among non-users.

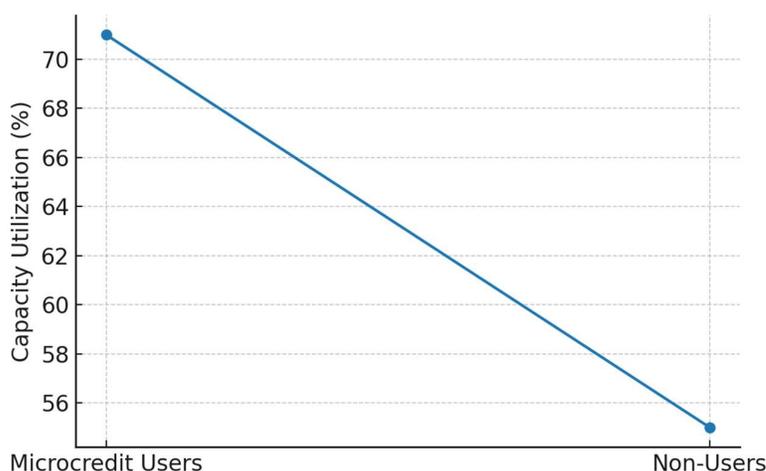


Figure 2: Capacity Utilization Trends of Microcredit Users and Non-Users

The observed performance gap underscores the pivotal role of credit in enabling enterprises to procure adequate raw materials, sustain operations throughout the year, and reduce idle processing time. Credit users were able to finance bulk cassava purchases and cover recurrent expenses, thereby mitigating common disruptions that plague small-scale processors. This outcome is consistent with the evidence from Phillip et al. (2013), who emphasized that credit-constrained agribusinesses in Nigeria often underperform due to irregular input supply. Similarly, Conning and Udry (2007) and Roodman and Morduch (2014) argued that access to liquidity not only expands productive capacity but also stabilizes enterprise operations against seasonal volatility.

Beyond the quantitative gap, the results suggest that microcredit fosters more resilient business models. By operating closer to installed capacity, credit users improve their economies of scale, spread fixed costs over larger output volumes, and strengthen their market competitiveness. In contrast, non-users remained vulnerable to high raw cassava prices,

supply fluctuations, and working capital shortages, factors that force them to underutilize their installed equipment and reduce production cycles. These findings resonate with recent studies on agro-processing in Sub-Saharan Africa, which stress that inadequate financing is one of the main constraints limiting processors from achieving optimal efficiency (Alene et al., 2021; Ogebe, Ali, & Olagunju, 2025). Taken together, the evidence indicates that microcredit is not merely a financial input but a structural enabler of higher capacity utilization, allowing processors to maximize installed infrastructure and achieve more consistent output delivery. This dynamic is crucial for strengthening the cassava value chain, given the sector’s central role in food security, industrial raw material supply, and rural employment in Nigeria.

Two-Stage Least Squares (2SLS) Regression Results

To correct for endogeneity in credit–performance relationships, 2SLS was employed. The first stage estimated credit participation, while the second stage estimated effects on profitability and capacity utilization. Results are presented in Table 3.

Table 3: 2SLS Estimates of Determinants of Enterprise Performance

Variable	Profitability Coefficient (t-ratio)	Capacity Utilization Coefficient (t-ratio)
Microcredit Access	0.462*** (4.95)	0.398*** (3.88)
Education (years)	0.075** (2.31)	0.062* (1.91)
Processing Experience	0.048* (1.78)	0.041 (1.55)
Household Size	0.023 (1.22)	0.011 (0.87)
Constant	2.146 (7.23)	1.895 (6.74)
R ²	0.967	0.961

*Note: *p < 0.10; **p < 0.05; ***p < 0.01.

The results confirm that microcredit access has a positive and statistically significant impact on both profitability and capacity utilization. This supports the theoretical argument of Stiglitz and Weiss (1981) that credit alleviates liquidity constraints, enabling enterprise efficiency. The high R² values suggest strong model fit, consistent with similar credit studies in Africa (Simtowe & Zeller, 2006; Olomola & Gyimah-Brempong, 2014).

Discussion

The findings provide compelling evidence that access to microcredit significantly enhances enterprise outcomes in cassava processing. Credit users demonstrated higher profitability, superior capacity utilization, and greater adoption of improved processing technologies, underscoring the transformative potential of microfinance in stimulating small-scale agro-enterprise performance (Morduch, 1999; Hermes & Lensink, 2007; Adebisi, Zannu, & Alaka, 2023). These results affirm that microcredit can serve as both a financial and developmental tool, enabling processors to scale operations, invest in efficiency-enhancing technologies, and participate more actively in markets.

Nonetheless, the persistence of working capital shortages and low competitiveness among non-users reveals that structural barriers remain deeply entrenched. This aligns with concerns raised by Coleman (1999) and Bateman (2010), who cautioned that microcredit, in the absence of enabling institutional frameworks, may exacerbate inequalities by disproportionately benefiting better-positioned entrepreneurs. The uneven impacts observed in this study suggest that while microcredit is vital, it is not a panacea for rural enterprise development.

The results highlight the necessity of embedding credit access within a broader ecosystem of institutional and policy support. This includes tailored financial literacy training, access to reliable input and output markets, and risk-sharing mechanisms that reduce default risks for both lenders and borrowers. Within Nigeria's agricultural finance landscape, platforms such as the Anchor Borrowers' Programme and NIRSAL guarantees (CBN, 2020; NIRSAL, 2021) offer important vehicles for integrating credit with capacity building, cooperative linkages, and value chain financing. Strengthening these frameworks will not only amplify the benefits of microcredit but also ensure that cassava processors—particularly small-scale operators—are better equipped to sustain growth, compete effectively, and contribute to agricultural transformation in Nigeria.

CONCLUSION, RECOMMENDATIONS AND PRACTICAL IMPLICATIONS

This study has shown that access to microcredit significantly enhances the performance of cassava processors in South-East Nigeria. Microcredit users consistently recorded higher gross margins, greater capacity utilization, and higher levels of market participation compared to their non-credit counterparts. The 2SLS regression results further confirmed that microcredit exerts a positive and statistically significant influence on profitability and operational efficiency, suggesting that financial access is not only a determinant of enterprise growth but also a catalyst for value chain strengthening in the cassava subsector. Beyond profitability, credit recipients also

demonstrated higher adoption of improved processing technologies, reflecting how financial inclusion can drive innovation in rural enterprises.

From a policy perspective, the findings underscore the importance of targeted interventions that improve access to affordable credit for small-scale processors. Government-backed schemes such as the Anchor Borrowers' Programme and NIRSAL guarantees should be expanded to cover a wider range of agricultural processors, while existing barriers such as collateral requirements and high transaction costs should be eased. Strengthening linkages between microfinance institutions, cooperatives, and rural processors will help bridge financing gaps and promote more inclusive participation in value chains. Equally, financial literacy and enterprise management training should accompany credit provision to enhance the capacity of processors to effectively utilize loans for productive investments.

The practical implications of this study extend beyond the cassava subsector. Cassava is one of Nigeria's most strategic staple crops, with strong backward linkages to farming and forward linkages to food, feed, and industrial uses. By improving the performance of processors, microcredit contributes to reducing post-harvest losses, increasing value addition, and raising rural incomes. This creates multiplier effects on employment, household consumption, and local trade. At the macroeconomic level, stronger cassava processing enterprises can boost Nigeria's agricultural GDP, given that agriculture already contributes over 25% of the nation's GDP and cassava is a key driver within that share. Enhanced productivity and competitiveness in cassava processing will not only improve domestic food security but also expand opportunities for exports, thereby supporting Nigeria's broader economic diversification agenda.

In summary, microcredit plays a pivotal role in bridging the financing gap among cassava processors, fostering enterprise growth, and enhancing the agricultural sector's contribution to Nigeria's GDP. A robust credit system that integrates affordability, accessibility, and complementary support services is crucial to unlock the full potential of cassava processing and, by extension, the transformation of Nigeria's rural economy.

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