



Loan Type, Credit Capacity, and Profitability Outcomes in Equipment-Financed Agro-Processing Firms in Southwest Nigeria.

BY

A. Oruma¹ and TM Akinbo²

^{1,2}Department of Management & Accounting, Lead City University, Ibadan, Oyo State, Nigeria



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Abstract

Agro-processing firms maintain a strategic position in agricultural industrialisation in Nigeria by adding value to raw agricultural products, creating jobs and reducing post-harvest losses. These businesses are dependent on the type and nature of modern processing equipment available. Agro-processing firms in Southwest Nigeria are mostly hampered by lack of access to adequate funds to purchase processing equipment; and hence constrain productivity, product quality and profitability, and thus preventing these firms to be competitive in the domestic and international markets. The impact of equipment financing on agro-processing firms in Southwest Nigeria was explored in this study. The survey research design was employed and the sample of 384 agro-processing firms was drawn from 6 states in the Southwestern Nigeria. Structured questionnaires were used to collect the data and the data were analysed using descriptive statistics and Partial Least Squares Structural Equation Modelling (PLS-SEM). The results showed that equipment financing has a strong significant aggregate influence on agro-processing firm profitability ($R=0.354$, $p<0.001$). Loan type ($\beta=0.266$, $t=4.356$, $p<0.001$) and credit capacity ($\beta=0.288$, $t=8.439$, $p<0.001$) has a significantly strong positive influence on profitability, interest rate ($\beta=0.099$, $t=2.007$, $p=0.045$) and loan tenure ($\beta=0.124$, $t=2.263$, $p=0.024$) have weak positive influences on profitability. This study recommended that the CBN and BOI should establish policies to support a well expanded scheme on equipment leasing as well as reinforce credit facilitation to these firms.

Keywords: Agricultural industrialisation, Agro-processing, Credit Capacity, Loan types.

1. INTRODUCTION

Agriculture represents the bedrock of the Nigerian economy, with an estimated 25% of GDP and 70% of rural employment tied to the sector (World Bank, 2023). Within agriculture, agro-processing businesses have a significant place since they bridge both primary production and value-addition. Agro-processing, through value adding activities, minimizes post-harvest losses, creates employment throughout value chains, and enhancing the nutritional value and marketability of produce (Naik, 2018). Agro-processing businesses in Southwest Nigeria, a region blessed with fertility and dense commercial networks as well as a massive market base, have the potential to trigger a transformation of the economy.

Despite this potential, the competitiveness and growth of the agro-processing sector are hindered by the prevalence of modern processing equipment deficit. The problem with inadequate and obsolete processing machinery includes a

reduction in throughput capacity, an increase in unit costs and compromising quality, which in turn impacts profitability and market competitiveness (Jenane, 2022). Therefore, acquiring appropriate equipment is not just an operational necessity but a strategic issue to business survival and growth. However, adequate financing to acquire these machines is largely inaccessible for the business owners.

The finance of equipment or productive assets known as equipment financing is the process by which firms utilize credit instruments like term loans, hire purchase and lease, or government lines of credit to purchase equipment without having to bear the entire initial capital outlay (Sule, 2014). This can either be in form of term loans or hire purchase schemes which comes with terms that reflect the repayment schedule, rate of interest and credit limit allocated to each business. This aspect affects both the cost of acquiring equipment and the financial burden on the business that will acquire it.

*Corresponding Author: A. Oruma..



Research literature on agricultural finance, particularly in sub-Saharan Africa, concentrates on credit provision on crops and working capital rather than medium and long term credit requirements such as those in the agro-processing industry (Oji-Okoro, 2021; Afolabi & Dare, 2022). A bulk of researches on equipment finance is from a macroeconomic or sector perspective, but few take the perspective of the firm and individual financing mechanisms affecting the profitability outcome. This paper addresses this gap by dissecting equipment finance to include loan type, credit limit, loan tenure and interest rate, and examines the impact of each dimension of equipment finance on the profitability of the agro-processing businesses in the southwest region of Nigeria.

This paper leans on two complementary streams of thought. The first is the Supply-Leading Finance Hypothesis, which was originally introduced by Patrick (1966) and asserts that the availability of proactively provided financial services (particularly those which facilitate long-term borrowing) can stimulate real economic growth by allowing firms to undertake capital investment which would otherwise not be feasible. When extended to the agro-processing context, this implies that wider access to finance for equipment acquisition should be directly associated with greater productive capacity and profitability. The second is the Resource-Based View (RBV) of the firm, most clearly articulated by Penrose (1959) and Barney (1991). The RBV holds that sustained competitive advantage arises from resources that are valuable, rare, inimitable and non-substitutable. Modern, industrial equipment constitutes a valuable resource in the context of the agro-processing industry that enables a firm to improve efficiency, achieve product differentiation, and deter entry from competitors less able to acquire such assets. Access to equipment financing can, therefore, act as an enabler of this resource and hence of the firm's competitive advantage and profitability (Fundira, 2025). Collectively, these theoretical suggest that equipment finance may not be merely a passive mechanism for obtaining funds, but an active contributor to capability formation and financial performance at the firm level.

1.1 Equipment Financing and Firm Profitability

The relationship between access to external finance and firm performance has been a significant focus in the literature. Broadly, financing constraints were identified by De la Torre, Martinez Peria, and Schmukler (2010) as one of the most binding constraints on growth for SMEs in developing economies. Since a high proportion of agro-processing firms in Nigeria might be characterized as SMEs, it is reasonable to assume that inability to finance equipment purchase limits the growth attainable by these enterprises. More specifically, studies on the importance of equipment financing in agricultural value chains find positive associations between access to machinery credit and processing efficiency and volume (Adesanya, Adeyemi, & Oludare, 2020). In a survey of food processing enterprises in Ogun state, Nigeria, Afolabi and Dare (2022) observed that firm relying on hire-purchase financing for machinery purchase attained higher gross margins compared to those financed by self-finance. The

mechanisms linking finance to profit usually involves capital deepening; credit allows firms to employ more capital-intensive processes instead of labor-intensive ones, thereby increasing total output per unit cost.

1.2 Interest Rate and Agro-Processing Performance

Interest rate levels and volatility play a key role in equipment financing costs. The combination of Nigeria's monetary policy rate and commercial bank lending spreads historically yields some of the highest borrowing costs within sub-Saharan Africa (CBN, 2023). High interest rates increase the total cost of equipment acquisition, thereby squeezing the margin between total revenue and finance charges. Both Obilor (2019) and Nwosu and Orji (2020) found a significant and negative relationship between the increase in interest rate and investment in productive assets among Nigerian SMEs. Larger enterprises, with better collateral and long-standing banking relationships, were less susceptible to rising rates because they could negotiate better terms or afford to pay more; for smaller agro-processing firms with little or no collateral, this effectively closed off the formal channels to equipment financing (Oji-Okoro, 2021).

1.3 Loan Tenure and Investment Horizons

The duration of equipment financing has important implications for both cost and strategic utility. Purchases in the agro-processing industry-including but not limited to machinery for milling, drying, sorting, packaging or preservation-are large and possess relatively long productive lifetimes. Short-term repayment schedules will necessitate that loan servicing be met from revenues that do not correspond to revenue generation from the asset itself, potentially even eroding profitability gains. Mbutor and Uba (2023) reported that Nigerian manufacturing SMEs with access to longer term financing had better financial performance than those whose loans had shorter repayment terms, arguing that short repayment periods create excessive liquidity pressure during critical start-up phase and undermine profit potential. A similar relation has been established for the agro-processing industry where loans with longer tenor is associated with greater rates of reinvestment and hence better profit outcomes (Adeyemo & Bamire, 2021).

1.4 Loan Type and Credit Capacity

The structure of a loan instrument varies considerably and therefore has differentiated implications. Common forms of equipment financing are term loans, hire-purchase, leasing or purchase with credit facilities from equipment vendors, while government sponsored credit schemes and special funds are also available. Different loan types have varying collateral requirements, cash flow characteristics, flexibility, and tax treatment. Agro-processing firms lacking ownership documents may find these alternatives more readily available than conventional term loans (Eze & Ibekwe, 2022). Overall Credit capacity, which is the largest amount of external credit a firm is able to obtain at reasonable terms, is probably one of the most structural constraints in Nigeria's agro-processing sector; as most of studies in Nigeria reveal a significant negative relationship between credit capacity and equipment acquisition among Nigerian SMEs (Adekunle & Olomola,

2021). Policy interventions such as the Agricultural Credit Guarantee Scheme Fund (ACGSF) by the CBN and credit facilities from Bank of Industry for agro-processing sector aim to circumvent this limitation.

2. METHODOLOGY

2.1. Research Design

The study adopted a cross-sectional survey research design. This approach is appropriate for collecting firm-level data at a single point in time to assess the relationships between financing characteristics and profitability outcomes. The survey was conducted across six Southwestern States of Nigeria: Ogun, Lagos, Oyo, Osun, Ondo, and Ekiti.

2.2 Population and Sampling

The population under investigation comprised all registered and active agro-processing business enterprises operating in the six Southwestern States of Nigeria. Using the formula by Cochran (1977) for determining the sample sizes from infinite or very large populations at 95% confidence level with 5% margin of error, a minimum of 384 respondents was derived for this study.

Table 1: Southwestern States Agricultural Zones

S/N	State	Agricultural Zones
1	Ogun State	Abeokuta, Ijebu Ode, Ikenne, Ilaro
2	Lagos State	Badagry, Igbogbo and Imota
3	Oyo State	Ibadan/Ibarapa, Oyo, Saki/Iseyin and Ogbomoso
4	Osun State	Iwo and Ikire; Ikirun and Osogbo; Ife and Ilesa
5	Ondo State	Akure, Owo, Ondo, Akoko North, Ikare and Okitipupa
6	Ekiti State	Aramoko, Ikere and Isan-Ekiti

2.3 Research Instrument

The structured questionnaire was the research instrument used in gathering the information required. It consisted of 16 items which were divided into five construct areas (interest rate, loan tenure, credit capacity, loan type and profitability). The measurement scale used was the four-point Likert scale ranging from 1 (Strongly Disagree) to 4 (Strongly Agree). The four-point scale was used to avoid the central bias issue associated with the five-point scale.

2.4 Validity and Reliability

Content validity was ensured by three experts in the field of agricultural finance and SME research. Construct validity was measured by Average Variance Extracted (AVE) with AVE >0.5 considered acceptable. Discriminant validity was

measured by Heterotrait-Monotrait ratio (HTMT ratio) and below 0.9 was confirmed. Pilot survey was conducted with 30 respondents and all AVE and HTMT ratios were confirmed to be acceptable. Internal consistency reliability of all constructs was also measured with Cronbach's Alpha (> 0.7) and Composite Reliability (CR > 0.7).

2.5 Common Method Bias

Given the cross-sectional self-report nature of the study, common method bias (CMB) was addressed through the common factor test procedure developed by Harman (1976). Results revealed that only one factor could be extracted from the data, accounting for less than 33% of the total variance. Therefore, common method bias is not a significant threat to the validity of the research findings (Podsakoff et al., 2003).

2.6 Data Analysis Approach

Data were analysed using descriptive statistics (frequency counts, means and standard deviations) and Partial Least Squares Structural Equation Modelling (PLS-SEM) with SmartPLS 4.0 software. PLS-SEM was chosen over covariance-based SEM because the former is appropriate for an exploratory study with moderate sample sizes and does not demand for multivariate normality assumptions. Two stages in this analysis include: first, assessment of the measurement model (loading values, AVE, CR and HTMT); second, assessment of the structural model (path coefficients, R², Q², and f²).

3. RESULTS

3.1 Demographic Characteristics

Of the 384 questionnaires distributed, 374 were recovered and completed, providing a response rate of 97.4 percent. The demographic profile of the respondents is summarized in Table 2.

Table2: Demographic Characteristics of Respondents (n = 374)

Variable	Category	Frequency (%)
Gender	Male	266 (71.1%)
	Female	108 (28.9%)
Age Group	Below 25 years	14 (3.7%)
	25–30 years	67 (17.9%)
	31–35 years	53 (14.2%)
	36–40 years	132 (35.3%)
	41–45 years	89 (23.8%)
Education	SSCE/OND/NCE	89 (23.8%)
	B.Sc/HND	133 (35.6%)

Variable	Category	Frequency (%)
	M.Sc/MBA	124 (33.2%)
	Other	28 (7.5%)
Experience	Less than 5 years	69 (18.4%)
	6–15 years	141 (37.7%)
	16–25 years	97 (25.9%)
	26–35 years	57 (15.2%)

From the distribution of gender, 71.1% of the respondents were males and 28.9% were females; this conforms with

documented statistics of male dominance in formal agro-processing enterprise ownership in Southwest Nigeria. As per age distribution, 35.3% of the respondents were within 36–40 year-olds, followed by 23.8% of the respondents in 41–45 year-olds group. This depicts that the industry is owned by middle aged entrepreneurs with experience in business operations. 68.8% of the respondents had a minimum of a Bachelor's Degree (B.Sc/HND), or Master's Degree, suggesting that there is a relatively educated class of entrepreneurs capable of managing business with formal financial instruments. Above 80% of the respondents have five years of working experience in the industry.

3.2 Descriptive Analysis of Constructs

3.2.1 Interest Rate

The views of respondents about interest rate as a feature of equipment financing are in Table 3.

Table 3: Descriptive Statistics – Interest Rate

Statement	SD (%)	D (%)	A (%)	SA (%)	Mean	Std. Dev.
Interest rate policies in Nigeria do not favour the growth of my business.	28.1	28.1	18.4	25.4	2.41	1.15
I prefer short-term loans due to the high cost of long-term financing driven by interest rates.	6.7	21.9	28.9	42.5	3.07	0.95
The volatility of interest rates makes it difficult to plan for long-term equipment investments.	15.8	34.2	29.1	20.9	2.55	0.99
Interest rate fluctuations increase the financial risk of equipment financing.	13.1	25.9	25.7	35.3	2.83	1.05
Overall	—	—	—	—	2.72	0.49

The mean score 2.72 (SD=0.49) suggests a moderately high degree of agreement among the respondents that interest rates are not favorable to equipment financing and planning, as evidenced by the fact that 71.4% of the respondents prefer short term loans over long term loans. This agrees with the loan tenure mismatch as identified by researchers of this field.

3.2.2 Credit Capacity

The responses on credit capacity constraints are shown in Table 4.

Table 4: Descriptive Statistics - Credit Capacity

Statement	SD (%)	D (%)	A (%)	SA (%)	Mean	Std. Dev.
Limited credit capacity restricts access to equipment financing.	7.8	34.0	38.2	20.1	2.71	0.88
Inadequate credit capacity leads to higher interest rates on equipment financing.	18.2	28.1	19.8	34.0	2.70	1.12
Enhancing credit capacity would reduce reliance on external collateral.	14.2	24.6	34.0	27.3	2.74	1.01

Statement	SD (%)	D (%)	A (%)	SA (%)	Mean	Std. Dev.
My business is hindered by insufficient credit capacity to finance equipment purchases.	11.5	25.9	32.1	30.5	2.82	1.00
Overall	—	—	—	—	2.74	0.53

An overall mean of 2.74 (SD=0.53) implies that credit capacity constraints serve as limitations for agro-processing enterprises. The higher standard deviation in the item on interest rate has indicated a greater divergence in the opinions

of firm owner regarding this matter, this must be influenced by business size and formalization.

3.2.3 Profitability

Table 5: Descriptive Statistics – Profitability

Statement	SD (%)	D (%)	A (%)	SA (%)	Mean	Std. Dev.
Profitability directly influences the growth and expansion of my business.	13.9	43.9	27.0	15.2	2.44	0.91
Low profitability hinders my ability to reinvest in new technologies.	11.0	17.1	29.9	42.0	3.03	1.02
I make enough profit annually.	18.7	24.1	32.6	24.6	2.63	1.05
Variability in profit affects the stability of my agro-processing business.	14.4	25.7	27.3	32.6	2.78	1.06
Overall	—	—	—	—	2.72	0.55

An overall mean score of 2.72 (SD=0.55) on the profitability construct. The item that has received majority approval from the respondents was that of reinvestment constraints that low profitability limits investment in new technology and hence equipment financing which is of prime importance in this research.

3.3 PLS-SEM Results: Effect of Equipment Financing on Profitability

After satisfactory validation of measurement model (loading factors > 0.70 for each item, AVE values > 0.50, HTMT ratios < 0.85, and the variance of common latent factor < 33%), the structural model was estimated. In Table 4.5 are the paths coefficients, standard errors, and t- statistics and effect size for all paths leading to profitability.

Table 6: PLS-SEM Structural Model Results – Equipment Financing and Profitability

Path	β (Coefficient)	Std. Error	t-Statistic	p-Value	Decision
Credit Capacity → Profitability	0.288	0.034	8.439	< 0.001	Supported
Loan Type → Profitability	0.266	0.061	4.356	< 0.001	Supported
Loan Tenure → Profitability	0.124	0.055	2.263	0.024	Supported
Interest Rate → Profitability	0.099	0.049	2.007	0.045	Supported

Model Fit: $R^2 = 0.354$ ($p < 0.001$); $Q^2 = 0.913$; $f^2 = 0.311$. Bootstrapping: $n = 5,000$ sub-samples.

The four dimensions of equipment financing jointly explain 35.4% of the variance in agro-processing firm profitability ($R^2 = 0.354$). A strong value of $Q^2 = 0.913$ indicated good prediction validity and the value $f^2 = 0.311$ demonstrated moderate-to-large effect size (Cohen, 1988). As observed

from the path coefficients, credit capacity had the highest positive relationship with profitability ($\beta = 0.288$, $t = 8.439$, $p < 0.001$) followed by loan type ($\beta = 0.266$, $t = 4.356$, $p < 0.001$). Both relationships are significant at 0.1% level. Both loan tenure ($\beta = 0.124$, $t = 2.263$, $p = 0.024$) and interest rate ($\beta = 0.099$, $t = 2.007$, $p = 0.045$) were also significant with a p-value < 0.05,

however they showed lower degrees of correlation. Thus, the hypothesis that equipment financing influences the profitability of agro-processing firms in Southwest Nigeria (H1) is supported.

4. DISCUSSION

The results revealed credit capacity to be the single strongest predictor of agro-processing profit, which is in line with the supply-leading finance hypothesis (Patrick, 1966) and empirical literature on Nigerian SME financing (Adekunle & Olomola, 2021; Oji-Okoro, 2021). Higher capacity indicates that firm gains access to a greater amount of credit than it needs for the immediate purpose, hence enabling them to use technically advanced machines, enjoy higher economies of scale, and achieve higher returns per unit output. This argument is supported by the relatively higher significance t-statistic (8.439) for credit capacity across the sample. A particular novelty is in the granular representation of credit capacity as distinct dimension separate from other financial parameters like loan type. Thus, the quantum is as critical as structure of a loan for the profitability. Policy implication for expanding credit limits through guarantee schemes and risk sharing facilities is critical and arguably important as loan structures reforms.

The significant impact of loan type on profitability ($\beta = 0.266$, $p < 0.001$) is also a confirmation of findings made by Eze & Ibekwe (2022) and Afolabi & Dare (2022) that loan structural components like collateral light of leasing arrangement, long term concessionary interest rate in BOI financing mechanism influence profit of agro-processing business. This result suggests that effective guiding of firms to obtain appropriate financing alternatives to the standard commercial bank loan could contribute to considerable firm profits.

This also fits in with the RBV argument that resource acquire process influences the competitive potential. Equipment obtained through lease saves the liquidity that could be invested on further operations and further investment.

Loan maturity ($\beta = 0.124$) and interest rate ($\beta = 0.099$) although are statistically significant at conventional significance level have much smaller coefficients. It can be concluded that these are non-binding limits for the firms in the sampled population, meaning that within existing observed ranges of interest rate and loan maturity in Nigeria agro-processing business.

Nevertheless, the significant effect of loan maturity and interest rate support previous empirical studies (Mbutor & Uba, 2023; Nwosu & Orji, 2020). This also indicates that lowering of interest rate and increase in loan maturity is a potential contributor to profit improvement of agro-processing businesses although is secondary to structural loan policy design of increased credit availability and diversity of financing instrument types.

The combined influence of supply-leading finance theory and RBV offers a more comprehensive framework for understanding equipment financing on business profit. For agro-processing firms, financial institutions and policy makers, these findings have critical implications.

Entrepreneurs must look for various types of financing and desist from commercial bank loans when purchasing equipment; Financial institutions must create more specialized financial products to take care of cash flow patterns and limited collateral capacity of agro-processing firms, policy makers (CBN and BOI) should actively work towards more widespread usage of equipment leasing and credit guarantee scheme targeting agro-processing firms.

5. CONCLUSION

This study examined how equipment financing affects the profitability of 374 agro-processing businesses in South West Nigeria using PLS-SEM analysis. Credit capacity and loan type were found to explain 35.4% of profit variation, supporting both supply-leading finance theory and the Resource-Based View.

Key policy recommendations include expanding and simplifying access to leasing and agricultural credit schemes, extending loan maturities to 7–10 years, adopting profit-based credit scoring, and strengthening business capacity building across the region.

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