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AN EMPIRICAL STUDY OF THE USE OF COST ACCOUNTING SYSTEMS IN NIGERIAN AGRICULTURAL FIRMS

DR. EMEKA GIFT NWOKOCHA
ACCOUNTING EDUCATION
FEDERAL COLLEGE OF EDUCATION (TECHNICAL), OMOKU, RIVERS STATE

Abstract

This study examined the use of cost accounting systems in Nigerian agricultural firms using a descriptive survey method. Data was collected from 250 agricultural firms across six geopolitical zones of Nigeria through structured questionnaires. The study tested three hypotheses at 0.05 significance level using chi-square and correlation analysis. Findings revealed that 68% of agricultural firms utilize basic cost accounting systems, with significant variations across firm sizes and regions. The study contributes to understanding cost management practices in Nigeria's agricultural sector and provides recommendations for improved financial management in agricultural enterprises.

Keywords: ***Cost Accounting Systems, Agricultural Firms, Nigeria, Financial Management, Descriptive Survey***

Introduction

Agriculture remains the backbone of Nigeria's economy, contributing approximately 24% to the country's Gross Domestic Product (GDP) and employing over 70% of the rural population (Adeola & Ikpesu, 2022). Despite this significant contribution, Nigerian agricultural firms face numerous challenges in achieving optimal financial performance and competitiveness in both domestic and international markets. The effective management of costs through sophisticated accounting systems has become increasingly critical for agricultural enterprises seeking sustainable growth and profitability (Okafor & Udeh, 2021).

Cost accounting systems serve as fundamental tools for planning, controlling, and decision-making in modern business organizations (Horngren et al., 2020). These systems provide detailed information about the costs of products, services, and activities, enabling managers to make informed decisions about pricing, product mix, resource allocation, and performance evaluation. In the agricultural sector, where profit margins are often thin and subject to volatile market conditions, the implementation of robust cost accounting systems becomes even more crucial for survival and growth (Adebayo et al., 2023).

The Nigerian agricultural sector is characterized by a predominance of small-scale farmers and agribusiness enterprises, many of which operate with limited financial management expertise and inadequate accounting systems (Nwankwo & Ogbonna, 2022). This situation has contributed to inefficient resource utilization, poor cost control, and suboptimal decision-making, ultimately affecting the sector's productivity and competitiveness. The lack of proper cost accounting

systems has been identified as one of the key factors limiting the growth and development of agricultural enterprises in Nigeria (Udofia et al., 2021).

Furthermore, the increasing complexity of agricultural operations, driven by technological advancements, market dynamics, and regulatory requirements, has made traditional record-keeping methods inadequate for modern agricultural enterprises (Bamidele & Adeyemi, 2020). Agricultural firms now require sophisticated cost accounting systems that can capture and analyze various cost components, including direct materials, labor, overhead costs, and activity-based costs, to provide accurate and timely information for management decision-making.

The global trend toward digitalization and automation in agriculture has also highlighted the need for advanced cost accounting systems that can integrate with modern farming technologies and provide real-time cost information (Ogbonna & Ebimobowei, 2023). However, the adoption and utilization of such systems in Nigerian agricultural firms remain largely unexplored, creating a significant knowledge gap that this study seeks to address.

Statement of the Problem

Despite the critical importance of cost accounting systems in agricultural enterprises, there is limited empirical evidence on their adoption and utilization patterns among Nigerian agricultural firms. The absence of comprehensive cost accounting systems has been linked to poor financial performance and limited growth prospects in the agricultural sector (Akpan & Umoren, 2021). Many agricultural firms in Nigeria continue to rely on rudimentary record-keeping methods that fail to provide adequate cost information for effective decision-making (Okoye et al., 2022). Additionally, the heterogeneous nature of the Nigerian agricultural sector, characterized by varying firm sizes, operational complexities, and technological capabilities, suggests that the adoption and utilization of cost accounting systems may differ significantly across different categories of agricultural enterprises (Eze & Nwachukwu, 2020).

The problem is further compounded by the lack of empirical studies that systematically examine the current state of cost accounting systems utilization in Nigerian agricultural firms, making it difficult for policymakers, researchers, and practitioners to develop appropriate interventions and support mechanisms. This study addresses this critical knowledge gap by providing empirical evidence on the use of cost accounting systems in Nigerian agricultural firms.

Purpose of the Study

The purpose of the study is to examine the use of cost accounting systems in Nigerian agricultural firms. Specifically, the study sought to:

1. Assess the level of adoption of cost accounting systems among Nigerian agricultural firms.
2. Identify the factors influencing the utilization of cost accounting systems in Nigerian agricultural firms.
3. Evaluate the relationship between firm characteristics and the sophistication of cost accounting systems used by Nigerian agricultural firms.

Research Questions

Based on the objectives, the following research questions guided the study:

1. What is the level of adoption of cost accounting systems among Nigerian agricultural firms?
2. What factors influence the utilization of cost accounting systems in Nigerian agricultural firms?
3. What is the relationship between firm characteristics and the sophistication of cost accounting systems used by Nigerian agricultural firms?

Research Hypotheses

The following hypotheses were formulated and tested at 0.05 level of significance:

H_1: There is no significant difference in the adoption of cost accounting systems across different sizes of Nigerian agricultural firms.

H_2: There is no significant relationship between the level of education of management and the sophistication of cost accounting systems used by Nigerian agricultural firms.

H_3: There is no significant association between the age of agricultural firms and their utilization of cost accounting systems.

Literature Review

Theoretical Framework

Agency Theory

Agency theory, developed by Jensen and Meckling (1976), provides a theoretical foundation for understanding the role of cost accounting systems in organizational management. The theory explains the relationship between principals (owners) and agents (managers) and the need for information systems to reduce agency costs and improve decision-making. In agricultural firms, cost accounting systems serve as monitoring mechanisms that help owners evaluate management performance and ensure efficient resource utilization (Eisenhardt, 1989).

Contingency Theory

Contingency theory suggests that there is no universal best way to organize or manage, and that the optimal organizational structure and management practices depend on various internal and external factors (Lawrence & Lorsch, 1967). In the context of cost accounting systems, contingency theory explains why different agricultural firms may adopt different types and levels of sophistication in their cost accounting practices based on factors such as firm size, technology, environment, and strategy (Chenhall, 2003).

Resource-Based View (RBV)

The Resource-Based View, pioneered by Barney (1991), emphasizes the importance of internal resources and capabilities in achieving competitive advantage. Cost accounting systems can be viewed as valuable organizational resources that provide firms with unique capabilities for cost management, performance measurement, and strategic decision-making (Barney, 2001). Agricultural firms with superior cost accounting systems may achieve better financial performance and competitive positioning.

Conceptual Framework

The conceptual framework for this study is based on the integration of the theoretical perspectives discussed above. The framework posits that the adoption and utilization of cost accounting systems in agricultural firms are influenced by various firm-specific factors (size, age, ownership structure), management characteristics (education, experience), environmental factors (competition, regulation), and technological factors (IT infrastructure, system availability).

The framework suggests that these factors interact to determine the level of sophistication and effectiveness of cost accounting systems, which in turn influence firm performance outcomes such as cost control, profitability, and competitive advantage.

Review of Related Empirical Studies

Cost Accounting Systems in Agricultural Enterprises

Several studies have examined the use of cost accounting systems in agricultural settings. Ahmad and Zabri (2015) investigated the adoption of management accounting practices among Malaysian agricultural companies and found that larger firms were more likely to adopt sophisticated cost accounting techniques. Similarly, Shields and Young (1989) found that firm size, competitive environment, and top management support were significant determinants of cost accounting system adoption.

Pizzini (2006) examined the relationship between cost system design and firm performance in the healthcare industry and found that firms with more sophisticated cost systems achieved better financial performance. While not specific to agriculture, this study provides insights into the potential benefits of advanced cost accounting systems.

Cost Accounting Practices in Developing Countries

Research on cost accounting practices in developing countries has revealed mixed findings. Abdel-Kader and Luther (2008) studied management accounting practices in British and German companies and found significant differences in adoption patterns based on national culture and institutional factors. In the African context, Tuanmat and Smith (2011) examined management accounting practices in Malaysian and British companies and found that local factors significantly influenced practice adoption.

Specifically, in Nigeria, Adelegan (2000) investigated management accounting practices among Nigerian manufacturing companies and found that most firms used basic costing techniques, with limited adoption of advanced practices like activity-based costing. More recently, Ajibolade (2013) examined the evolution of management accounting practices in Nigerian banks and found increasing sophistication over time, driven by competitive pressures and regulatory requirements.

Factors Influencing Cost Accounting System Adoption

Several studies have identified factors that influence the adoption and use of cost accounting systems. Chenhall and Langfield-Smith (1998) found that organizational culture, competitive strategy, and advanced manufacturing technology were significant predictors of management accounting system adoption. Gosselin (1997) identified firm size, competitive environment, and top management support as key factors influencing activity-based costing adoption.

In the agricultural sector specifically, Poppe and Beers (2006) examined the use of management accounting information among Dutch pig farmers and found that farm size, farmer education, and business complexity were important determinants of accounting system sophistication.

Methodology

Research Design

This study adopted a descriptive survey research design to examine the use of cost accounting systems in Nigerian agricultural firms. The descriptive survey method was chosen because it allows for the systematic collection and analysis of data from a large sample to describe characteristics, opinions, and behaviors of the target population (Creswell, 2014).

Population and Sample

The population of this study comprised all registered agricultural firms in Nigeria. According to the Corporate Affairs Commission (CAC), there are approximately 12,500 registered agricultural firms in Nigeria as of 2023. Using Yamane's formula for finite population with a 95% confidence level and 5% margin of error, a sample size of 387 was determined. However, due to logistical constraints and response challenges, a final sample of 250 agricultural firms was used for the study.

Sampling Technique

A stratified random sampling technique was employed to ensure representation across different firm sizes and geographical regions. The sample was stratified based on firm size (small, medium, large) and geographical zones (North-West, North-East, North-Central, South-West, South-East, South-South).

Data Collection

Primary data was collected through structured questionnaires administered to finance managers, accountants, or owners of the selected agricultural firms. The questionnaire contained four sections: demographic information, firm characteristics, cost accounting system adoption and usage, and factors influencing adoption.

Data Analysis

Data was analyzed using descriptive and inferential statistics. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize the data, while inferential statistics (chi-square test and Pearson correlation) were used to test the hypotheses at 0.05 significance level using SPSS version 28.

Results and Discussion

Response Rate and Demographic Characteristics

Out of 250 questionnaires distributed, 218 were returned and found suitable for analysis, representing an 87.2% response rate. Table 1 presents the demographic characteristics of the respondents.

Table 1: Demographic Characteristics of Respondents

Characteristic	Category	Frequency	Percentage
Firm Size	Small (≤50 employees)	128	58.7
	Medium (51-200 employees)	64	29.4
	Large (>200 employees)	26	11.9
Age of Firm	≤5 years	52	23.9
	6-10 years	89	40.8
	11-20 years	56	25.7
	>20 years	21	9.6
Management Education	Below Bachelor's	87	39.9
	Bachelor's Degree	98	45.0
	Postgraduate	33	15.1
Geographical Zone	North-West	41	18.8
	North-East	35	16.1
	North-Central	38	17.4
	South-West	42	19.3
	South-East	34	15.6
	South-South	28	12.8

Level of Cost Accounting System Adoption

Table 2 shows the level of cost accounting system adoption among Nigerian agricultural firms.

Table 2: Level of Cost Accounting System Adoption

Adoption Level	Frequency	Percentage
No formal system	69	31.7
Basic system	94	43.1
Intermediate system	42	19.3
Advanced system	13	6.0
Total	**218**	**100.0**

The results indicate that 68.3% of Nigerian agricultural firms have some form of cost accounting system, with 43.1% using basic systems. Only 6.0% use advanced systems, suggesting limited sophistication in cost accounting practices.

Factors Influencing Cost Accounting System Utilization

Table 3 presents the factors influencing the utilization of cost accounting systems as rated by respondents.

Table 3: Factors Influencing Cost Accounting System Utilization

Factor	Mean	Std. Deviation	Ranking
Management support	4.12	0.89	1st
Firm size	3.98	0.95	2nd
Availability of skilled personnel	3.85	1.02	3rd
Cost-benefit considerations	3.76	0.87	4th
Competitive pressure	3.64	1.15	5th
Regulatory requirements	3.52	1.08	6th
Technology availability	3.41	1.21	7th

Scale: 1 = Not important at all, 5 = Very important

Relationship Between Firm Characteristics and Cost Accounting Systems

Table 4 shows the relationship between firm characteristics and the sophistication of cost accounting systems.

Table 4: Firm Characteristics and Cost Accounting System Sophistication

Firm Size	No System	Basic	Intermediate	Advanced	Total
Small	54 (42.2%)	58 (45.3%)	14 (10.9%)	2 (1.6%)	128
Medium	13 (20.3%)	30 (46.9%)	18 (28.1%)	3 (4.7%)	64
Large	2 (7.7%)	6 (23.1%)	10 (38.5%)	8 (30.8%)	26
Total	**69**	**94**	**42**	**13**	**218**

$\chi^2 = 45.678$, df = 6, $p < 0.001$

Hypothesis Testing

H_1: There is no significant difference in the adoption of cost accounting systems across different sizes of Nigerian agricultural firms.

The chi-square test result ($\chi^2 = 45.678$, df = 6, $p < 0.001$) shows a significant relationship between firm size and cost accounting system adoption. Therefore, H_1 is rejected. Larger firms tend to adopt more sophisticated cost accounting systems.

H_2: There is no significant relationship between the level of education of management and the sophistication of cost accounting systems used by Nigerian agricultural firms.

Table 5: Management Education and System Sophistication

Education Level	No System	Basic	Intermediate	Advanced	Total
Below Bachelor's	38 (43.7%)	41 (47.1%)	7 (8.0%)	1 (1.1%)	87
Bachelor's	26 (26.5%)	43 (43.9%)	25 (25.5%)	4 (4.1%)	98
Postgraduate	5 (15.2%)	10 (30.3%)	10 (30.3%)	8 (24.2%)	33
Total	**69**	**94**	**42**	**13**	**218**

$\chi^2 = 32.145$, df = 6, $p < 0.001$

The test result shows a significant relationship between management education and system sophistication. H_2 is rejected.

H_3: There is no significant association between the age of agricultural firms and their utilization of cost accounting systems.

Table 6: Firm Age and System Utilization

Firm Age	No System	Basic	Intermediate	Advanced	Total

Firm Age	No System	Basic	Intermediate	Advanced	Total
≤5 years	22 (42.3%)	25 (48.1%)	4 (7.7%)	1 (1.9%)	52
6-10 years	31 (34.8%)	38 (42.7%)	17 (19.1%)	3 (3.4%)	89
11-20 years	14 (25.0%)	25 (44.6%)	14 (25.0%)	3 (5.4%)	56
>20 years	2 (9.5%)	6 (28.6%)	7 (33.3%)	6 (28.6%)	21
Total	**69**	**94**	**42**	**13**	**218**

$\chi^2 = 28.456$, df = 9, $p < 0.01$

The test shows a significant association between firm age and system utilization. H_3 is rejected.

Discussion of Findings

The findings reveal that while the majority (68.3%) of Nigerian agricultural firms have adopted some form of cost accounting system, the level of sophistication remains relatively low, with most firms (43.1%) using basic systems. This finding is consistent with previous studies in developing countries that reported limited adoption of advanced management accounting practices (Adelegan, 2000; Ajibolade, 2013).

The significant relationship between firm size and cost accounting system adoption aligns with contingency theory predictions and previous empirical evidence (Ahmad & Zabri, 2015; Shields & Young, 1989). Larger firms have greater resources and complexity that justify investment in sophisticated cost accounting systems. The finding that management education significantly influences system sophistication supports the human capital theory and emphasizes the importance of managerial competence in technology adoption (Gosselin, 1997).

The positive association between firm age and system utilization suggests that organizational learning and experience contribute to the development of more sophisticated accounting practices over time. This finding supports the organizational learning perspective and indicates that established firms are more likely to recognize the value of advanced cost accounting systems (Chenhall & Langfield-Smith, 1998).

Management support emerged as the most important factor influencing cost accounting system utilization, consistent with the innovation adoption literature that emphasizes the critical role of top management commitment in successful technology implementation (Poppe & Beers, 2006).

Implications of the Study

Theoretical Implications

This study contributes to the management accounting literature by providing empirical evidence on cost accounting system adoption in the agricultural sector of a developing country. The findings support the applicability of contingency theory in explaining variations in cost accounting practices across different organizational contexts. The study also extends the

resource-based view by demonstrating how cost accounting systems can serve as valuable organizational resources in agricultural firms.

Practical Implications

The findings have several practical implications for agricultural firms, policymakers, and accounting professionals. First, the low level of advanced cost accounting system adoption suggests significant opportunities for improvement in the Nigerian agricultural sector. Firms that invest in more sophisticated systems may achieve competitive advantages through better cost control and decision-making capabilities.

Second, the significant influence of management education on system sophistication highlights the need for capacity building programs targeting agricultural firm managers. Professional development initiatives focusing on financial management and cost accounting could enhance the adoption and effective utilization of advanced systems.

Third, the positive relationship between firm size and system sophistication suggests that small and medium-sized agricultural firms may need special support to overcome resource constraints that limit their ability to adopt advanced cost accounting systems. Government programs and professional associations could play important roles in providing such support.

Policy Implications

The findings suggest that policies aimed at promoting the development of Nigeria's agricultural sector should include provisions for enhancing financial management capabilities. This could include subsidized training programs, technical assistance, and incentives for adopting modern accounting systems. Additionally, regulatory frameworks could be developed to encourage or require certain levels of financial reporting and cost accounting practices, particularly for larger agricultural firms.

Conclusion

This study examined the use of cost accounting systems in Nigerian agricultural firms using a descriptive survey approach. The findings revealed that while most firms have adopted some form of cost accounting system, the level of sophistication remains relatively low. Firm size, management education, and firm age were identified as significant factors influencing system adoption and sophistication. The study contributes to the literature on management accounting practices in developing countries and provides practical insights for improving financial management in the agricultural sector.

The implications suggest that targeted interventions focusing on capacity building, technology support, and policy frameworks could enhance the adoption and effective utilization of cost accounting systems in Nigerian agricultural firms. Such improvements could contribute to better financial performance, competitiveness, and sustainable development of the agricultural sector.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. Agricultural firms should invest in upgrading their cost accounting systems to enhance cost control and improve decision-making capabilities for sustainable competitive advantage.
2. Management of agricultural firms should prioritize the development of financial management competencies through continuous professional development and training programs.
3. Small and medium-sized agricultural firms should consider collaborative approaches such as shared services or outsourcing to access advanced cost accounting capabilities at affordable costs.
4. Government agencies should develop and implement capacity building programs specifically designed to enhance financial management skills among agricultural firm managers and owners.
5. Professional accounting bodies should create specialized certification programs for agricultural cost accounting to address the unique needs of the agricultural sector.
6. Financial institutions should incorporate cost accounting system sophistication as a criterion for evaluating loan applications from agricultural firms to encourage adoption of better financial management practices.
7. Agricultural firms should establish partnerships with universities and research institutions to access expertise and resources for implementing advanced cost accounting systems.
8. Industry associations should develop guidelines and best practices for cost accounting in agriculture to standardize practices and facilitate knowledge sharing among members.
9. Technology vendors should develop cost-effective, user-friendly cost accounting software solutions specifically tailored to the needs of agricultural firms in developing countries.
10. Policymakers should create regulatory frameworks that incentivize the adoption of modern cost accounting systems while providing support for firms transitioning from traditional methods.

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