

Article

The role of management accounting methods in analyzing agricultural costs and improving returns

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Abstract: This study examined the role of management accounting methods in analyzing agricultural costs and improving returns in public agricultural institutions in Iraq. The study was based on the importance of applying these methods in light of the challenges facing the Iraqi agricultural sector. It aimed to analyze the reality of their use and their impact on the accuracy of cost analysis and the improvement of financial returns. The study relied on the descriptive analytical approach, and data were collected from a sample of 181 employees from four public agricultural institutions in Iraq using a questionnaire specifically designed for this purpose. To ensure the accuracy of the results, the validity and reliability of the study tool (the questionnaire) were verified by presenting it to specialized experts and calculating the validity and reliability coefficients using appropriate statistical methods. The results showed that the questionnaire achieved a high level of reliability, confirming its suitability for data collection and the accuracy of the results derived from it. The results of the demographic data analysis showed that the majority of the research sample hold a bachelor's degree, work as agricultural engineers or accountants, and have varying experience in the agricultural field. The results of the descriptive statistical analysis revealed awareness of the importance of management accounting methods among public agricultural institutions. However, their effective implementation still requires further development. The results of hypothesis testing using simple regression analysis confirmed a strong positive relationship between the use of management accounting methods, on the one hand, and the accuracy of agricultural cost analysis and improved financial returns, on the other. The study reached a set of conclusions, the most important of which are: the need to develop a work environment that encourages the effective use of management accounting methods, and the importance of investing in technological infrastructure and training employees on these methods. The study also recommended the need to fully integrate management accounting methods into the decision-making processes in agricultural institutions, and to conduct further field research and studies in the future to deepen our understanding of the reality of these methods in the Iraqi agricultural sector. This study highlights the importance of providing integrated training programs for employees in public agricultural institutions to enhance their capabilities in the field of management accounting methods, with a focus on training them in the use of specialized computer programs in this field. The study also emphasizes the importance of conducting periodic evaluations of the effectiveness of these methods and their impact on improving the performance of agricultural institutions. This will contribute to developing work mechanisms and overcoming any obstacles that may hinder the effective implementation of these methods.

Keywords: Management accounting methods, agricultural cost analysis, revenue improvement, public agricultural enterprises, Iraq.

INTRODUCTION

The world today is witnessing rapid transformations in various fields, and the agricultural sector is perhaps the most important, given its pivotal role in achieving food security and sustainable development. To achieve these two goals, it has become necessary to leverage all modern tools and technologies, including management accounting methods, which play a crucial role in analyzing agricultural costs and improving returns.

Many previous studies have addressed the role of management accounting methods in improving the performance of agricultural institutions. In their 2019 paper, "Management accounting research on farms: what is known and what needs knowing," Ndemewah, Menges, and Hiebl emphasized the importance of these methods in managing risk and making sound investment decisions. Kudryashova et al.'s (2020) study, "The organization of management accounting as a mechanism to improve the efficiency of agricultural enterprises," also emphasized the role of these methods in improving the efficiency of agricultural resource use and increasing productivity.

This study is based on the importance of applying management accounting methods in Iraqi agricultural institutions. It aims to analyze the reality of their use and their impact on analyzing agricultural costs and improving returns in public agricultural institutions in Iraq. Through this, the research seeks to provide a clear vision of the role of these methods in advancing the Iraqi agricultural sector, enhancing its competitiveness, and achieving sustainable development.

IMPORTANCE OF RESEARCH

This study derives its importance from two main aspects: the first is theoretical, and it enriches the theoretical aspect related to the role of management accounting methods in enhancing the efficiency and effectiveness of agricultural institutions. This is achieved by presenting an integrated conceptual framework that clarifies the relationship between these methods and the elements of cost analysis and revenue improvement in the context of Iraqi agricultural institutions. The second aspect is practical, as the importance of the research lies in providing practical results and recommendations that contribute to assisting decision-makers in Iraqi agricultural institutions in applying management accounting methods effectively to achieve optimal use of available resources, improve production efficiency, and increase profitability, which will positively impact the Iraqi agricultural sector as a whole.

Research Objectives

This study seeks to achieve a set of objectives:

- 1-Identifying the reality of using management accounting methods in public agricultural institutions in Iraq.
- 2-Measuring the impact of using management accounting methods on the accuracy of agricultural cost analysis.
- 3-To determine the extent to which the use of management accounting methods contributes to improving the financial returns of public agricultural institutions in Iraq.
- 4-Providing a set of scientific and practical recommendations that contribute to enhancing the role of management accounting methods in developing the performance of Iraqi agricultural institutions.

RESEARCH PROBLEM

Public agricultural enterprises in Iraq face significant challenges in light of rapid economic and environmental changes. The most prominent of these challenges are weak

production efficiency, rising costs, and declining returns. This is partly due to the failure to fully utilize modern management accounting techniques, which play a pivotal role in cost analysis and sound management decision-making. Despite the importance of these techniques, their application in Iraqi agricultural enterprises remains limited, preventing them from fully exploiting their potential to improve performance and enhance profitability. Based on the above, the research problem is represented by the following two questions:

1-What is the reality of using management accounting methods in public agricultural institutions in Iraq?

2-What is the impact of using management accounting methods on analyzing agricultural costs and improving returns in these institutions?

HYPOTHESES

The following hypotheses are tested in this study:

The first hypothesis: There is a statistically significant effect of using management accounting methods on the accuracy of agricultural cost analysis in public agricultural institutions in Iraq.

The second hypothesis: There is a statistically significant effect of using management accounting methods on improving financial returns in public agricultural institutions in Iraq.

PREVIOUS LITERATURE

Many studies have addressed the role of management accounting methods in improving the performance of agricultural institutions, highlighting their importance in making effective administrative decisions and managing risks. For example, the study by Ndemoah, Minges, and Hepple (Ndemewah, Menges, & Hiebl (2019, pp. 58-86) titled "Management Accounting Research on Farms: What is Known and What We Need to Know?" emphasized the vital role of these methods in risk management and sound investment decision-making, emphasizing the need to update these methods to keep pace with developments in the agricultural sector. Kudryashova et al. (2020) also highlighted the importance of organizing management accounting as a mechanism for improving the efficiency of agricultural enterprises, highlighting the role of these methods in improving resource utilization and increasing productivity. Studies have not only focused on the role of management accounting methods in decision-making and risk management, but have also examined their impact on the financial performance of agricultural enterprises. In a study conducted by Al-Antari (2020) on the impact of using these methods on the financial performance of Jordanian industrial companies, it was found that these methods had a positive impact on profitability and improved financial efficiency. Ditkaew's (2023) study also confirmed that the application of strategic management accounting contributes significantly to achieving a competitive advantage for agricultural enterprises, leading to improved financial performance. Additionally, a recent study by Ali et al. (2024) showed that the characteristics of the agricultural industry directly impact management accounting practices, emphasizing the need to design these practices to suit the nature and needs of the agricultural sector. It is worth noting that numerous studies have highlighted the importance of training employees in the use of management accounting methods and providing computer programs that assist in their effective application (Nahal and Awaysheya 2017; Al-Zamar 2022; Bohia 2023). It can be argued that a review of previous literature confirms the pivotal role of management accounting methods in improving the performance of agricultural enterprises, from accurate cost analysis to enhancing profitability and achieving sustainable development.

This study stands out from previous literature in its direct focus on the reality of the use of management accounting methods in public agricultural institutions in Iraq. This fills a research gap related to understanding this aspect in the Iraqi context, especially given the limited number of studies addressing this topic. While previous studies have focused on the impact of management accounting methods on agricultural enterprises in general, or on specific agricultural sectors in other countries, this study sheds light on the challenges

and opportunities facing public agricultural institutions in Iraq regarding the application of these methods. This contributes to providing a clearer vision on ways to improve the performance of these institutions and their role in achieving food security and sustainable development in the country.

This study also distinguishes itself from previous literature in terms of methodology, as it adopts a quantitative approach based on analyzing data from a large sample of employees of four public agricultural institutions in Iraq, which enhances the accuracy of the results and their generalizability. The study also employs a set of advanced statistical methods using the program SPSS, such as Cronbach's Alpha to measure questionnaire reliability, and simple regression analysis to test hypotheses related to the impact of management accounting methods on the accuracy of cost analysis and revenue improvement. This combination of a large sample size and rigorous statistical methods gives the study a strength and precision that distinguishes it from many previous studies that relied on smaller samples or less accurate analysis methods.

RESEARCH METHODOLOGY

This study adopts a descriptive analytical approach, aiming to analyze the reality of the use of management accounting methods in public agricultural institutions in Iraq and measure their impact on the accuracy of agricultural cost analysis and improved returns. To achieve this, a specially designed questionnaire was used to collect data from a sample of 181 employees from four public agricultural institutions in Iraq. A program was used. SPSS, version 27, was used to analyze the data. This included descriptive statistics (arithmetic mean and standard deviation) to review the sample characteristics and study variables. Cronbach's Alpha was used to measure the reliability of the questionnaire, while the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test were used to measure internal consistency. To measure the impact of management accounting methods on the accuracy of agricultural cost analysis and revenue improvement, a simple linear regression analysis test was used.

RESEARCH LIMITS

This study is limited to three main aspects. Temporally, the study is limited to collecting and analyzing data from August 2024 to February 24, 2024. Human resources are focused on employees of four public agricultural institutions in Iraq: the Iraqi Company for Agricultural Products, the Iraqi Company for Dates Trade and Processing, the Iraqi Company for Fish Production and Marketing, and Al-Atifiya Feed Production Company Limited. The results are not generalizable to other institutions or non-governmental organizations. Spatially, the study is conducted within Iraq only, recognizing the possibility of differences in its results when applied to other countries with different economic or agricultural characteristics.

RESEARCH COMMUNITY AND SAMPLE

The research community comprises employees and experts from a number of Iraqi institutions, including the Iraqi Company for Agricultural Products, the Iraqi Company for Dates Trade and Processing, the Iraqi Company for Fish Production and Marketing, and Al-Atifiya Feed Production Company Limited. These institutions were specifically selected due to their extreme importance, as they represent fundamental pillars of the Iraqi agricultural sector, covering vital production sectors such as the production and marketing of dates, fish, and feed, which makes studying their reality of utmost importance. The importance of selecting public institutions also lies in the possibility of studying the application of management accounting methods in light of the challenges and resources available to this sector in particular. This gives the study a practical dimension and contributes to providing applicable proposals aimed at improving the performance of these institutions and supporting the public agricultural sector in Iraq. The number of targeted employees in these institutions was 291 individuals.

THEORETICAL FRAMEWORK OF THE RESEARCH

Management accounting is a fundamental pillar in the management and development of organizations, particularly in the agricultural sector, which is facing increasing challenges in light of rapid economic and environmental changes. The application of management accounting methods plays a vital role in improving the performance of agricultural enterprises by providing accurate and comprehensive information that assists management in making effective strategic decisions. Agricultural cost analysis, which helps determine production costs and analyze the factors affecting them, is one of the most important applications of management accounting in this sector. Furthermore, improving returns, which reflects an organization's ability to increase profits and achieve better financial performance, is a key goal for any agricultural enterprise.

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First: Management accounting methods:

Management accounting methods are defined as a set of tools and techniques used within organizations to provide financial and non-financial information to management to assist them in planning, control and decision-making (Ndemewah, Menges, & Hiebl 2019, 59). This includes various methods such as cost control, profitability analysis, budgeting, variance analysis, and performance evaluation. These methods are vital for agricultural enterprises to enable them to manage their resources efficiently, accurately analyze costs, and maximize profitability (Al-Zumar 2022, 75).

Second: Agricultural cost analysis:

Agricultural cost analysis is an essential element in the management of agricultural enterprises, as it contributes to accurately determining the cost of production, analyzing the relationship between cost and production volume, and identifying opportunities to reduce costs and increase efficiency (Nahal and Awaishiya 2017). Agricultural cost analysis includes identifying and classifying all direct and indirect costs, analyzing the relationship between fixed and variable costs, and comparing actual costs with established standards (Abdelrady 2024, 15).

Third: Improving returns:

Improving returns refers to the ability of an organization to increase its profits and achieve better financial performance, and this is a major goal for any agricultural organization (Ditkaew 2023, 4). Revenue improvement is achieved through several factors, including increased sales, reduced costs, improved operational efficiency, and enhanced competitiveness (Al-Antari 2020).

Fourth: The relationship between variables:

Many studies indicate a strong positive relationship between the use of management accounting methods and improved performance of agricultural enterprises, including the accuracy of cost analysis and enhanced returns. By providing accurate and comprehensive information about costs and revenues, management accounting methods contribute to improving managerial decision-making related to product pricing, inventory management, crop selection, and investment evaluation, ultimately leading to improved operational efficiency and increased profitability (Ali et al. 2024, 3518).

The researcher believes that the effective application of management accounting methods in public agricultural institutions in Iraq would significantly contribute to improving the

accuracy of agricultural cost analysis, thereby increasing returns and achieving better financial performance. This requires providing a work environment that encourages the use of these methods, training employees to apply them correctly, and providing the necessary computer programs to support these processes.

Practical framework for research

Based on a theoretical framework that highlights the importance of management accounting methods in improving the performance of agricultural institutions, this practical framework focuses on the research methodology and tools used to collect and analyze data. This methodology includes identifying the study instrument the questionnaire, and analyzing its characteristics in terms of validity and reliability. It also presents the steps followed in analyzing the sample's demographic data, analyzing descriptive statistics and trends, and testing the hypotheses formulated at the beginning of the research.

1. Study tool:

This study relied on a questionnaire specifically designed to collect data from the research sample. The questionnaire consists of three main sections: The first section collects demographic data from the sample members, such as educational level, job title, and years of experience in the agricultural field. The second section addresses the independent research variable (management accounting methods) through seven statements measuring the extent to which agricultural institutions rely on these methods. The third section focuses on the two dependent research variables: agricultural cost analysis (seven statements) and revenue improvement (eight statements). A five-point Likert scale (from "strongly agree" to "strongly disagree") was used to measure the degree of sample members' agreement with the questionnaire statements. Data analysis will rely on statistical software.SPSS in its twenty-seventh version (SPSS 27).

2. Validity and reliability of the questionnaire:

Before beginning data collection from the primary sample, the validity and reliability of the study tool (questionnaire) were verified to ensure the accuracy and reliability of the results. The questionnaire was initially presented to a group of experts specializing in accounting and agricultural management to obtain its apparent validity and ensure the appropriateness of its phrases to the study objectives, as well as their clarity and precise wording. After making appropriate adjustments based on the experts' comments, validity and reliability coefficients were calculated using the following statistical methods.

Table 1: Result of the questionnaire stability test

| Reliability Statistics | | |
|------------------------|------------------|-------------------------------|
| N of Items | Cronbach's Alpha | variable |
| 7 | 0.780 | Management accounting methods |
| 7 | 0.865 | Agricultural cost analysis |
| 7 | 0.847 | Improve returns |
| 21 | 0.926 | questionnaire |

Source: Researcher using outputsSPSS

To measure the reliability of the questionnaire, Cronbach's alpha coefficient was used.Cronbach's Alpha is one of the most common measures of internal consistency between questionnaire items. The results of Table (1) indicate that the questionnaire achieved a high level of reliability, as the Cronbach's Alpha coefficient for the questionnaire as a whole reached (0.926), indicating a high level of internal consistency between the questionnaire items. The results also show that all dimensions of the questionnaire achieved high levels of reliability, as the Cronbach's Alpha coefficient values ranged between (0.780) for the management accounting methods variable and (0.865) for the agricultural cost analysis variable. All of these values are higher than the statistically acceptable level of (0.70) according to most studies, which confirms the stability of the study tool and its suitability for data collection.

Table 2: The result of the internal consistency test

| KMO and Bartlett's Test | | |
|-------------------------|--------------------|-------------------------------|
| 0.832 | KMO. | |
| 2253.407 | Approx. Chi-Square | Bartlett's Test of Sphericity |
| 210 | df | |
| .000 | Sig. | |

Source: Researcher using outputsSPSS

The table shows the results of the internal consistency test of the questionnaire using the Kaiser-Meyer-Olkin coefficient (KMO) and Bartlett's test of sphericity. The KMO coefficient measures the suitability of data for factor analysis, with a value greater than 0.7 indicating a good fit. In this case, the KMO value was 0.832, indicating that the questionnaire data were well suited for factor analysis. Bartlett's test of sphericity is used to test whether the correlation matrix between variables is an identity matrix, where a significance value (Sig.) of less than 0.05 indicates that the null hypothesis is rejected, thus confirming the presence of significant correlations between the variables. In this case, the Chi-Square value was 2253.407 with a significance value (Sig.) of 0.000, which conclusively indicates that the null hypothesis is rejected, confirming the presence of significant correlations between the variables, and thus the suitability of the data for factor analysis. Based on the results of both tests, it can be concluded that the questionnaire data has internal consistency validity and is suitable for conducting factor analysis and drawing conclusions.

3. Demographic information analysis:

Table 3: The result of the internal consistency test

| Academic qualification | | |
|------------------------|-----|------------|
| % | N | |
| 55.2% | 100 | Bachelor's |
| 42.5% | 77 | Master's |
| 2.2% | 4 | PhD |

| Job title | | |
|-----------|-----|-----------------------|
| % | N | |
| 59.1% | 107 | agricultural engineer |
| 31.5% | 57 | accountant |
| 5.5% | 10 | Financial Officer |
| 3.9% | 7 | boss |

| Years of service in the banking sector | | |
|--|----|--------------------|
| % | N | |
| 25.4% | 46 | Less than 5 years |
| 14.9% | 27 | 5-10 years |
| 28.7% | 52 | 11-15 years |
| 30.9% | 56 | 15 years and older |

Source: Researcher using outputsSPSS

The table shows the demographic characteristics of the sample included in the study. It is noted that the majority of the research sample held a bachelor's degree (55.2%), followed by master's degree holders (42.5%), while doctoral degree holders constituted a very small percentage of 2.2%. This indicates that the educational level of employees

in public agricultural institutions is mainly limited to bachelor's and master's degrees. In terms of job titles, agricultural engineers constituted the largest percentage (59.1%), followed by accountants (31.5%), while financial officers and managers each constituted a small percentage, not exceeding 9.4%. This indicates that the majority of the research sample were technicians specialized in the agricultural field, which may be explained by the nature of work in these institutions requiring such specializations. Regarding years of service, the sample was closely distributed across the different categories. Those with less than 5 years of experience constituted 25.4%, while those with 5-15 years of experience constituted approximately 43.6%. The highest percentage, at 30.9%, was those with over 15 years of experience. This diversity in years of experience reflects the presence of cadres with varying levels of experience within these institutions, which may constitute a wealth of accumulated expertise and contribute to the transfer of knowledge between generations.

4. Descriptive statistics and trends analysis:

After reviewing the sample's demographic characteristics, we now turn to analyzing the descriptive statistics and trends for the main study variables: management accounting methods, agricultural cost analysis, and yield improvement. This analysis aims to understand the research sample's opinions and perceptions about these variables and their relationships to each other by reviewing the rates of agreement or disagreement with the questionnaire statements related to each variable.

Table 4: The result of the direction of the sample members' answers to the variable of management accounting methods

| The result | standard deviation | middle | Sample | Paragraph |
|------------|--------------------|--------|--------|---|
| I agree | .81159 | 3.8840 | 181 | The organization relies on a variety of management accounting methods (such as cost control, profit analysis, budgets) to make better decisions.. |
| I agree | 1.06680 | 3.5470 | 181 | The management accounting methods used in the organization are updated periodically to keep pace with developments in the agricultural field.. |
| I agree | 1.00609 | 3.6298 | 181 | The organization's employees are adequately trained in the use of modern management accounting methods.. |
| neutral | 1.01075 | 3.2983 | 181 | The institution has specialized computer programs that support the application of management accounting methods.. |
| neutral | .98618 | 3.2873 | 181 | The organization's management is encouraged to use the data and information provided by management accounting methods.. |
| I agree | .96641 | 3.6685 | 181 | Management accounting methods are effectively integrated with the operational processes of the organization.. |
| I agree | .74840 | 4.1326 | 181 | The organization periodically evaluates the effectiveness of the applied management accounting methods and their impact on performance.. |
| I agree | .62277 | 3.6354 | 181 | Management accounting methods |

Source: Researcher using outputsSPSS

The table results indicate a positive trend toward the use of management accounting methods in public agricultural institutions. The mean for the "Management Accounting Methods" axis was 3.6354, with a standard deviation of 0.62277, indicating the sample members' general agreement with their institutions' adoption of these methods. The statement "The institution periodically evaluates the effectiveness of the applied

management accounting methods and their impact on performance" received the highest approval rate (4.1326), while the statement "The institution has specialized computer software that supports the application of management accounting methods" and the statement "The institution's management encourages the use of data and information provided by management accounting methods" received the lowest approval rates (3.2983 and 3.2873, respectively). Analytically, this result demonstrates that public agricultural institutions recognize the importance of management accounting methods and apply them fairly well. However, there are opportunities for improvement in terms of providing specialized computer software and the administrative support necessary to better implement these methods.

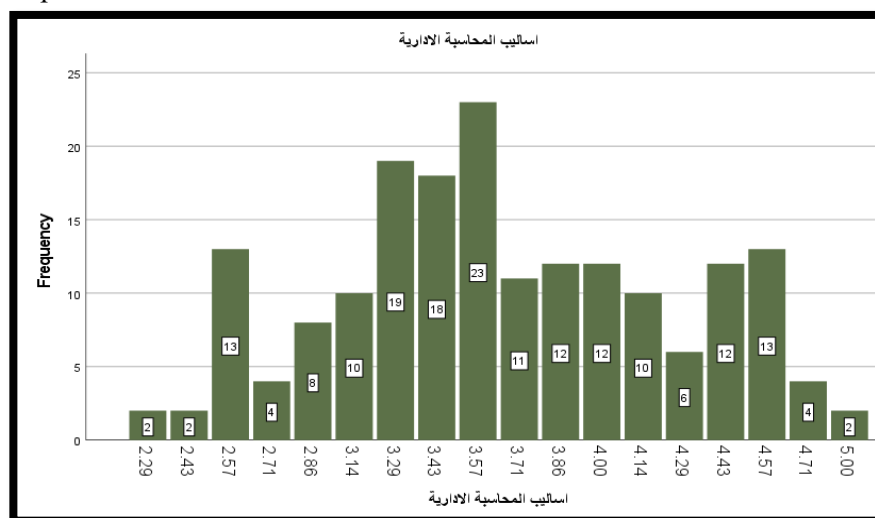


Figure 1: Explanation of the direction of answers to the variable of management accounting methods

Source: Researcher using outputsSPSS

Table 5: The result of the direction of the sample members' answers to the agricultural cost analysis variable

| The result | standard deviation | middle | Sample | Paragraph |
|------------|--------------------|--------|--------|--|
| I agree | 1.03050 | 3.6077 | 181 | All direct and indirect costs related to the agricultural process are accurately identified and classified.. |
| I agree | .92675 | 3.7845 | 181 | Cost analysis methods (such as variable and fixed costs) are used to study the relationship between cost and production volume.. |
| I agree | .88421 | 4.0387 | 181 | Costs are analyzed periodically to identify opportunities to reduce costs and increase efficiency.. |
| I agree | .81762 | 3.9392 | 181 | Cost analysis information is used to determine fair and profitable selling prices for agricultural products.. |
| I agree | .91834 | 3.9669 | 181 | Cost analysis is used to evaluate the feasibility of using new agricultural technologies or crops.. |
| I agree | .86182 | 3.8287 | 181 | Actual costs are compared with standard costs to identify deficiencies and take corrective action.. |

| | | | | |
|---------|--------|--------|-----|---|
| I agree | .79575 | 4.0110 | 181 | Cost analysis information is used to make informed decisions about leasing or purchasing agricultural equipment.. |
| I agree | .66431 | 3.8824 | 181 | Agricultural cost analysis |

Source: Researcher using outputsSPSS

Data analysis shows a positive trend toward agricultural institutions' reliance on cost analysis methods in their work. The mean for the "Agricultural Cost Analysis" axis was 3.8824 with a standard deviation of 0.66431, reflecting the sample members' general agreement that their institutions perform good cost analysis. The statement "Costs are analyzed periodically to identify opportunities for cost reduction and increased efficiency" received the highest approval rate (4.0387), while the statement "All direct and indirect costs related to the agricultural process are accurately identified and classified" received the lowest approval rate (3.6077). Analytically, this indicates that public agricultural institutions recognize the importance of cost analysis in managerial decision-making and continuously strive to improve the efficiency of their cost management.

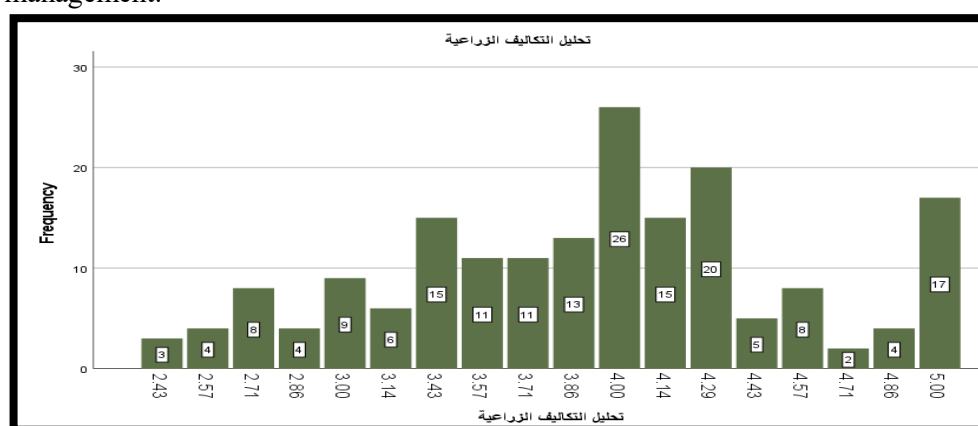


Figure 2: Illustration of the direction of answers to the agricultural cost analysis variable

Source: Researcher using outputsSPSS

Table 6: The result of the direction of the sample members' answers to the variable of improving returns

| The result | standard deviation | middle | Sample | Paragraph |
|------------|--------------------|--------|--------|---|
| I agree | .81239 | 3.7403 | 181 | The company has witnessed an increase in net profit in recent years.. |
| I agree | .77023 | 3.7624 | 181 | The organization's ability to obtain the necessary financing to develop its operations has improved.. |
| I agree | .83571 | 3.7735 | 181 | The company has gained a good reputation among customers and suppliers.. |
| I agree | .80883 | 3.9171 | 181 | Employees became more satisfied with the work environment in the organization.. |
| I agree | .76386 | 3.8343 | 181 | The organization's use of resources is efficient.. |
| I agree | .83468 | 3.9061 | 181 | The organization can effectively meet market requirements and adapt to changes.. |

| | | | | |
|---------|--------|--------|-----|--|
| I agree | .84320 | 3.9890 | 181 | The organization has the ability to face risks and challenges well.. |
| I agree | .58524 | 3.8461 | 181 | Improve returns |

Source: Researcher using outputsSPSS

The results of the analysis of the "Improving Returns" variable show a generally positive trend, with the axis mean reaching 3.8461 with a standard deviation of 0.58524, indicating that sample members view their organizations' improved returns positively in recent years. The statement "The organization has the ability to address risks and challenges well" achieved the highest approval rate (3.9890), while the statement "The organization has witnessed an increase in net profit in recent years" achieved the lowest approval rate (3.7403). Analytically, this result reinforces the importance of continuing to apply management accounting and cost analysis methods effectively to ensure sustainable and profitable returns. The higher percentage of sample members agreeing with their organizations' ability to address challenges and risks well also indicates confidence in the robustness of these organizations' structures and their ability to adapt to future changes.

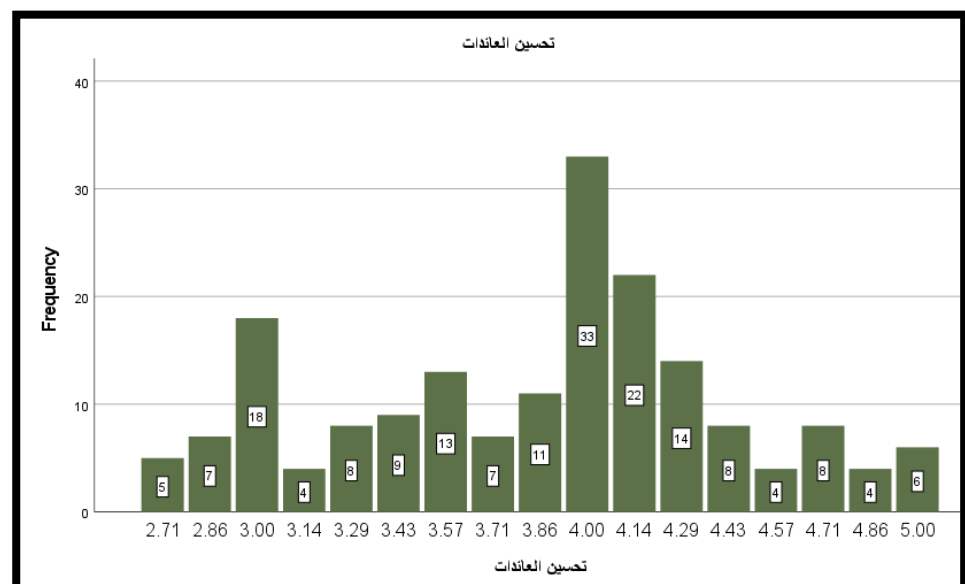


Figure 3: Explain the direction of the answers to the revenue improvement variable
Source: Researcher using outputsSPSS

5. Hypothesis testing:

After analyzing the descriptive statistics and trends of the research sample's opinions on the study variables, we now move to the hypothesis testing phase. This phase aims to verify the existence of a statistically significant relationship between the variable "management accounting methods" as an independent variable and each of the variables "agricultural cost analysis" and "yield improvement" as dependent variables. Simple regression analysis will be used to test the two main hypotheses of the research. The first states that management accounting methods have a positive impact on the accuracy of agricultural cost analysis, while the second assumes a positive impact of these methods on improving the returns of public agricultural institutions in Iraq.

Table 7: The result of testing the first hypothesis

| Model Summary ^b | | | | | | |
|----------------------------|---|----------|-------------------|--------------------|----------------------------|---------------|
| Model | R | R Square | Adjusted R Square | F Statistics (sig) | Std. Error of the Estimate | Durbin-Watson |
| | | | | | | |

| | | | | | | |
|---|-------|------|------|----------------|--------|-------|
| 1 | .720a | .518 | .515 | 192.5 (000) | .46241 | 2.153 |
|---|-------|------|------|----------------|--------|-------|

| Coefficients ^a | | | | | | |
|---|-------------------------------|-----------------------------|------------|---------------------------|--------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 1 | (Constant) | 1,091 | .204 | | 5.345 | .000 |
| | Management accounting methods | .768 | .055 | .720 | 13,875 | .000 |
| a. Dependent Variable: Agricultural Cost Analysis | | | | | | |

Source: Researcher using outputsSPSS

The results of testing the first hypothesis using simple regression analysis show that there is a statistically significant relationship between the two study variables. The coefficient of determination (R Square) indicates that management accounting methods explain 51.8% of the variance in the accuracy of agricultural cost analysis variable. The F-statistical value reached (192.5) with a significant value (Sig.) less than (0.05), indicating the importance of the statistical model. Looking at the regression coefficient for the variable "management accounting methods," we find it positive and equal to (0.768) with a significant value (Sig.) less than (0.05), which means that with every one-unit increase in the degree of institutions' reliance on management accounting methods, the accuracy of their agricultural cost analysis increases by (0.768) units. Based on these results, the null hypothesis is rejected and the first hypothesis of the study is accepted, which states that "there is a statistically significant effect of the use of management accounting methods on the accuracy of agricultural cost analysis in public agricultural institutions in Iraq." Analytically, this positive effect of management accounting methods on the accuracy of cost analysis is important for the public agricultural sector in Iraq..

Table 8: The result of testing the second hypothesis

| Model Summary ^b | | | | | | |
|----------------------------|-------|----------|-------------------|----------------------------|--------------------|---------------|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | F Statistics (sig) | Durbin-Watson |
| 2 | .656a | .430 | .427 | .44319 | 134.8 (000) | 1.902 |

| Coefficients ^a | | | | | | |
|--|-------------------------------|-----------------------------|------------|---------------------------|--------|------|
| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
| | | B | Std. Error | Beta | | |
| 2 | (Constant) | 1.607 | .196 | | 8,213 | .000 |
| | Management accounting methods | .616 | .053 | .656 | 11,614 | .000 |
| a. Dependent Variable: Improve returns | | | | | | |

Source: Researcher using outputsSPSS

The results of testing the second hypothesis using simple regression analysis indicate that there is a statistically significant relationship between the variable "management accounting methods" as an independent variable, and the variable "return improvement"

as a dependent variable. The coefficient of determination (R Square) indicates that management accounting methods explain 43% of the variance in the revenue improvement variable. The F-statistical value reached (134.8) with a significant value (Sig.) less than (0.05), confirming the importance of the statistical model. Looking at the regression coefficient for the "management accounting methods" variable, we find it positive and equal to (0.616) with a significant value (Sig.) less than (0.05), which means that with every one-unit increase in the degree of institutions' reliance on management accounting methods, their revenue improvement increases by (0.616) units. Based on these results, the null hypothesis is rejected and the second hypothesis of the study is accepted, which states that "there is a statistically significant effect of using management accounting methods on improving financial returns in public agricultural institutions in Iraq." Analytically, this result is a positive indication that the effective application of management accounting methods can contribute to improving the financial performance of these institutions and increasing their profitability. This positive impact can be explained by the role of these methods in providing more accurate and comprehensive information that helps management make sound decisions regarding resource management, costs, and pricing. These results can be used to encourage public agricultural institutions to adopt management accounting methods more widely and develop the capabilities of their employees in this field.

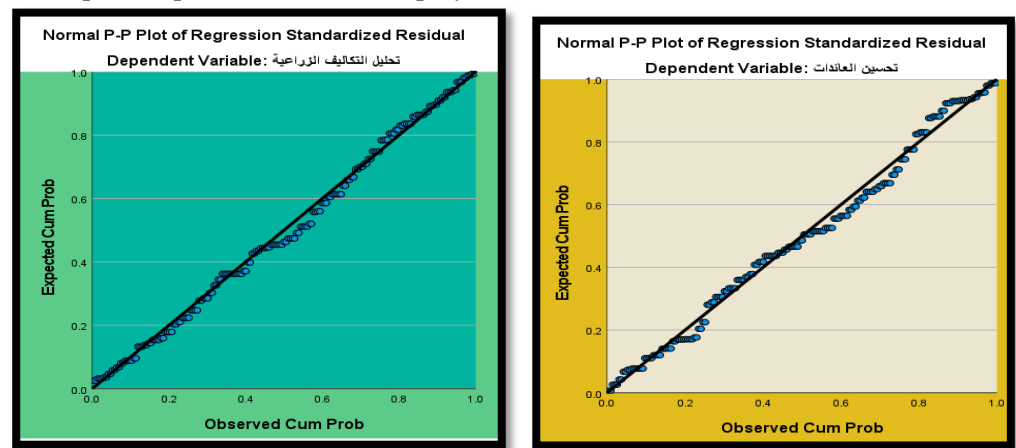


Figure 4: Illustration of the normal distribution of the residuals of the models

Source: Researcher using outputsSPSS

The chart showsThe normal distribution of standard residuals for regression is a tool for assessing the extent to which the distribution of residuals conforms to a normal distribution. A close fit of the points to a straight line indicates that the residuals follow a normal distribution. In both figures, most points are distributed close to a straight line, indicating that the residuals in the first and second regression models follow a distribution close to normal. The Durbin-Watson coefficient, used to analyze the autocorrelation of models, was 2.153 in the first model and 1.902 in the second model. These values indicate that there is no significant autocorrelation between the residuals in either model, as they fall within the acceptable range of 1.5 and 2.5. Based on the above, the results of the two models' quality tests in terms of normal distribution and autocorrelation indicate that the two regression models meet the criteria for use and that the results obtained from them have a good degree of reliability.

CONCLUSIONS

1- The study results demonstrate awareness of the importance of management accounting methods among public agricultural institutions in Iraq. However, their effective implementation still requires further development. This is evident in the varying degrees of agreement with the questionnaire statements. Some statements related to evaluating the effectiveness of these methods received high approval ratings, while others related to

the availability of supporting computer programs and employee training received lower ratings.

2-The study confirms a strong positive relationship between the use of management accounting methods, on the one hand, and the accuracy of agricultural cost analysis and improved financial returns, on the other. This finding encourages agricultural institutions to adopt these methods more widely to enhance their efficiency and achieve their financial goals.

3-The study results indicate the importance of investing in technological infrastructure and training employees in modern management accounting methods. This can be achieved by providing specialized computer programs and organizing training courses to qualify personnel capable of using these methods correctly.

4-The study highlights the need for further research and field studies in the future to deepen our understanding of the reality of management accounting methods in the Iraqi agricultural sector. Such research could contribute to identifying the challenges facing the application of these methods and proposing practical solutions to overcome them.

Recommendations

- ✓Working to develop a work environment that encourages the effective use of management accounting methods, by issuing clear instructions and decisions by the responsible authorities obligating agricultural institutions to implement these methods systematically.
- ✓Working to fully integrate management accounting methods into the decision-making processes in agricultural institutions, by providing the necessary training for employees on how to use these methods in various areas of agricultural work.
- ✓Working to provide the technological infrastructure necessary to effectively implement management accounting methods, by providing specialized computer programs for management accounting that are compatible with the nature of agricultural work.
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