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Impact of Time-Driven Activity-Based Costing in Improving Financial Performance: A Study on a Sample of Companies in Kurdistan Region

By

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Abstract

The research addressed the use of the impact of the Time-Driven Activity-Based Costing (TDABC) in improving financial performance of a sample of industrial units in the Kurdistan Regional of Iraq. As the research problem was the possible application of the (TDABC) in industrial units in the Kurdistan Regional and their contribution to reducing production costs, increasing resource efficiency in production and rationalizing pricing decisions to improve financial performance due to dramatic changes in economic systems. Traditional cost systems have not kept pace with developments in the business environment because of its inability to compete and improve financial performance. The research aimed to identify the concept, importance and objectives of TDABC, highlight them in reducing costs and their impact on the performance of economic units, measure the correlation between TDABC and improve financial performance. The research concluded a set of findings, the most important of which was the main result through a set of sub-findings, namely, the impact of TDABC on the relevance, correlation and impact of improving financial performance. Finally, the study has recommended several recommendations, the most important of which was the need to identify the benefits of the application of the TDABC in improving financial performance. The need for industrial economic units in Kurdistan-Iraq Regional to take care of the development of their cost systems in order to reach the delivery of products of high value and more accurately in the modern business environment.

Keywords: Time-driven activity-based Costing (TDABC), Financial Performance

Introduction

Cost systems have witnessed a range of developments resulting in the revision of traditional cost accounting systems, which have been criticized as a result of inaccurate and inappropriate information provided in the modern environment. In the light of these criticisms on traditional cost systems, the cost system appeared the Activity-Based Costing (ABC), but was subject to many criticisms, particularly with regard to the high costs of the comprehensive survey and interviews with the personnel needed to compile the data and information needed to complete the ABC and a personal estimate and judgement of the time allocation for the enterprise's activities. Furthermore, the difficulty of maintaining the system as a result of changes in operational processes as well as changes in resource expenditure such as the addition of new activities and increased diversity of products, distribution channels and

customers. Therefore, improving its performance has become an important focus of economic unit management because of its need to know the effectiveness and efficiency of its performance, depending on the availability of valuable information on the cost of these activities. Thus, the need of these units for modern costing methods and techniques provides appropriate information to assist in the process of evaluating their performance, addressing the inadequacy of traditional techniques and methods and the much criticized regarding the difficulty of allocating the cost of indirect resources. So, cost technique of TDABC appeared, which solve the problems and constraints of previous traditional techniques by relying on time orientations to allocate the cost of indirect resources. It is based on ABC using time and being the primary guideline in allocating cost resources on this basis. Cost technique will be used and applied on TDABC to improve financial performance and through appropriate information provided by this modern technique that serves administrative systems to improve the performance of economic units, solve problems and difficulties faced by traditional techniques and reduce costs by identifying untapped energy.

Research Problem

The search problem is determined by the following questions:

- What is the possibility of applying the TDABC in industrial units in the Kurdistan Regional?
- Does the application of the TDABC contribute to reducing production costs to improve financial performance?
- Does the application of the TDABC contribute to more efficient use of resources in production to improve financial performance?
- Does the application of the TDABC contribute to rationalizing pricing decisions to improve financial performance?

Research Importance

The importance of research stems from the importance of TDABC in addressing indirect industrial costs that have been and continue to be problematic in calculating this cost on the one hand, rationalizing the cost on the other hand, and making operational decisions for industrial companies where it helps companies to determine the cost of outputs more precisely. It also provides more accurate and effective information, which helps to provide rational decision-making reports. This is reflected in the company's financial performance.

Research Objectives

The research aims to achieve the following objectives:

- Studying and analyzing cost technique of TDABC and highlight the advantages and characteristics of this technique in reducing production cost and allocating indirect costs properly and equitably.
- Studying the feasibility of applying the TDABC in Kurdistan Regional companies.
- Measuring the correlation between the TDABC and improving financial performance.
- Measuring the impact of the TDABC on improving financial performance.

Research Hypothesis

The research is based on the following hypotheses:

1. First Hypothesis: A statistically significant correlation exists at the level (0.05 ≥ a) between the TDABC and improving financial performance by reducing production costs.
2. Second Hypothesis: There is a statistically significant impact at the level (0.05 ≥ a) of TDABC on improving financial performance by reducing production costs.
3. Third Hypothesis: A statistically significant correlation exists at the level (0.05 ≥ a) between the TDABC and improved financial performance through increased resource efficiency in production.
4. Fourth Hypothesis: There is a statistically significant impact at the (0.05 ≥ a) level of TDABC on improving financial performance through increased resource efficiency in production.
5. Fifth Hypothesis: A statistically significant correlation exists at the level of (0.05 ≥ a) between TDABC and improving financial performance by rationalizing pricing decisions.
6. Sixth Hypothesis: There is a statistically significant impact at the (0.05 ≥ a) level of TDABC on improving financial performance by rationalizing pricing decisions.

Research Methodology

In order to achieve the study's objectives and test its hypotheses, the following methodological tools were adopted:

- Theoretical Descriptive Approach within the theoretical aspect by relying on available sources of books, periodicals, letters and scientific dissertations.
- Statistical Analytical Descriptive Approach of the field study of variables within the category of industrial economic unit's sample research by preparing a questionnaire form as a data collection tool for the field study.

Research Boundaries

This study was limited to the following boundaries:

- Spatial Boundaries: The spatial boundaries of this study are in the industrial companies' sector in the Kurdistan Regional of Iraq.
- Time Boundaries: This study will take place in 2022.

Previous Studies

Study of (Ali, et al., 2021)

- Under the title "Impact of TDABC Technique in Pricing Decisions".
- The research aimed to demonstrate the role of cost technique of TDABC as a contemporary technique suited to rapid changes and developments in the external environment with its scientific and practical philosophy in allocating indirect costs.
- This research is an attempt to demonstrate the role of cost technique of TDABC in making pricing decisions by providing accurate data and information that contributes

to the process of formulating such decisions in the light of the multiplicity of alternatives.

- Boundaries of research: The spatial boundaries of research at the Cement Al-Kufa Plant in Najaf Al-Ashraf are affiliated with the State Company for Iraqi Cement/Southern Collaborators and are one of the formations of the Ministry of Industry and Minerals. Whereas time boundaries of research were from January to April 2021.

Conclusions

1. There is a strategic role for cost technique of TDABC by providing reliable and appropriate information according to time orientations and to enable tracking the true cost of products or services.
2. Cost technique of TDABC has an active role to play in assisting different administrative levels in making decisions based on reasonably sure objective information.
3. Cost technique of TDABC is a comprehensive indirect cost management system that helps reduce costs by giving it a comprehensive view of untapped energy.
4. Cost technique of TDABC contributes to supporting pricing decisions by providing objective information on the allocation of indirect costs under resource and activity orientations of time.
5. Cost technique of TDABC contributes to resource and activity cost management prior to the commencement of the production process to support pricing decisions by contributing to cost reductions.

Study of (Ibrahim, et al., 2019)

- Under the title "Cost Technique of TDABC System and Its Role in Increasing Competitive Advantage in Saudi Business Organizations".
- The research aimed to achieve the following objectives:

1. To identify the concept, objectives and main components of the TDABC.
2. To examine the role of the TDABC in increasing product quality.
3. To examine the role of the TDABC in increasing product price.

- This study addresses the subject of the TDABC and competitive advantage and the development of financial performance within Saudi business organizations.
- The spatial boundaries of research were Saudi Arabia-business organizations.
- The research has helped the TDABC to predict the amount of resource requirements to achieve a balance in resource capacity and thus achieve quality at the source (Saudi industrial organizations). The application of the TDABC has contributed to the process of making appropriate decisions regarding productive activities within the enterprise leading to improved product quality (Saudi industrial organizations). The application of the TDABC has contributed to reducing the flow of activities within the organization, positively affecting the quality of the product (Saudi industrial organizations). The enterprise cannot predict the amount of resource requirements to achieve a balance in resource capacity just by following the TDABC, thus find it difficult to price products (Saudi industrial organizations). TDABC allows calculation of the cost of inactive energy within the organization and therefore not use the pricing of products by Saudi industrial organizations.

Study of (Jouda, 2019)

- Under the title: "Application of the TDABC in the MRI Division in a Private Jordanian Hospital".

- The study is based on a key hypothesis that: The application of the TDABC will contribute to accurately determining the cost of in the MRI division, thus making rational decisions regarding pricing, performance assessment and identification of untapped energy.
- The study found that the cost of imaging is not calculated in the MRI division and in all the divisions of the radiology department because of the reliance on pre-set sales prices by the Jordanian Ministry of Health. The untapped energy ratio was 72 .2%, due to the high untapped energy ratio due to the nature of work in the MRI division because work in the MRI division is done 24/7 and the demand for imaging is concentrated more in daylight hours than at night.

Study of (Abdullah, et al., 2018)

- Under the title: "Use of Cost Technique of TDABC & its Role in Cost Reduction - Applied Study at the State Company for Electrical and Electronic Industries/Ministerial". The aim of the research is to demonstrate the cognitive pillars of cost technique of TDABC to assist management in optimizing the utilization of available resources and emphasizing the untapped and avoidable scope.
- The most important conclusion was that cost technique of TDABC provides competition to economic units by providing more accurate information on costs and contributes to the identification of untapped energy and reallocates available resources to economic units that cost technique of TDABC needs only two information, the time needed to carry out activities and the cost of one unit of activity. A number of recommendations have been reached, the most important of which is that company adopts a technique of TDABC to help reduce product costs by using time equivalents, emphasizing untapped energy that can be avoided and contributing to providing more accurate information on production costs that are necessary to improve the company's production processes.

Study of (Abdulnur, 2018)

- Under the title: "Cost Accounting & Improving the Financial Performance of the Foundation's ENPEC Setif, Case Study".
- The study aimed to highlight the importance of accounting for costs and the place they occupy and their role in improving the organization's financial performance. Highlighting the most important techniques used by accounting for modern special costs and that they must be used by the enterprise because they help it to strengthen its standing and compete with other institutions by following up on costs and trying to mitigate them. The importance of evaluation through the use of evaluation indicators and the extent to which the organization has evolved or retreated and helped to improve its performance.
- The research concluded that the institution did not adhere to the basic rules of cost accounting and that only traditional methods were used. There was no assessment of the National Electrochemical institution's financial performance. The organization is not used in financial indicators except for simple comparisons between the current and previous years. The enterprise uses the weighted average cost method to assess its inventory. Providing machines and thus the enterprise's inability to reach optimal power.

Study of (Al-Arabi, et al, 2020)

- Under the title: "Contribution of the TDABC to Improving the Performance of the Enterprise and Supporting its Competitive Position".

- The study aimed at contributing the accuracy of the TDABC to improving the enterprise's performance and supporting its competitive position.
- The study concluded that TDABC is one of the most important modern philosophies that brought together strategic management on the one hand and cost management on the other hand. It was able to provide an accurate measurement of the allocation of indirect private enterprise costs by relying on strategic distribution according to activities in complementarity with the optimal time system, thereby overcoming criticism of the system. The traditional "ABC" with an explanation of the concept of untapped energy that allows clarification of the strategic vision of the cost path to improve its management while accepting integration with other administrative systems of quality improvement system, target cost and other contributing to the good functioning of the enterprise and the development of its competitive position.

Study of (Nobley, 2014)

- Under the title: "Using of Management Accounting Tools in Improving the Financial Performance of the Economic Institution". A thesis submitted for the third phase doctorate in commercial science, Accounting specialization, Mohammed Khaidar University, Biskra.
- This study aimed to try to demonstrate the importance of assessing financial performance in achieving efficiency, effectiveness and early detection of vulnerabilities so that they can be addressed in a timely manner. It aimed to try to highlight the most important indicators adopted in the process of measuring and evaluating the financial performance of an economic institution.
- The research occluded many conclusions, the most important of which are:

1. Financial performance is a digitized financial measurement and indicators used to measure key expected outputs and objectives.
2. The growth and development of an economic enterprise depends largely on the efficiency and effectiveness of its financial performance.

Research Site from Previous Studies

The researcher prepares the study so that it would be a real addition to previous studies in terms of deepening the problem of the study and addressing the important focus of improving financial performance since it did not receive enough research according to the researcher's knowledge. The most important distinction of this study from previous studies is the application of the TDABC in improving the financial performance of industrial companies in the Kurdistan Regional of Iraq because there is no study to the researcher's knowledge. The most important areas of use for previous studies can be identified by the following points:

Research on previous studies is characterized by an analysis of the relationship between the application of the TDABC and the financial performance of Kurdistan Regional's industrial companies that adopt traditional cost systems and do not adopt modern methods of cost measurement.

The Financial Performance of Industrial Companies

I. Concept & Indicators of Financial Performance

Financial Performance is defined as: "the extent to which activities contribute to the creation of value or the effective use of available financial resources by achieving financial objectives at the lowest financial cost" (Ayyash, 24:2021). Financial performance is one of the most important tools for evaluating organizations' performance from several angles and in a

way that serves data users with financial interests in the organization to identify the strengths and weaknesses of the organization and to take advantage of the data provided by financial performance to rationalize financial decisions of users. The importance of financial performance also stems, in particular, from the process of following up on the business of the organization and examining its conduct, monitoring its conditions, assessing its performance levels and effectiveness, directing performance towards the right and needed direction by identifying constraints, explaining its causes, proposing corrective actions, rationalizing the organization's general uses and investments in accordance with the overall objectives of the institution and contributing to the making of sound decisions to maintain the sustainability and survival of the institution (Amal & Bathina, 38:2021)

It can be said that financial performance is a mechanism that enables the economic enterprise's success in optimizing the financial means available in the enterprise in order to achieve the established objectives.

II: Measuring Financial Performance

Measurement means the process of determining the digital values of objects or events according to certain rules that must be compatible with the characteristics of the objects or events in measurement. Measuring the financial performance of an economic enterprise is a significant step as it contributes to credibility in presenting the organization's financial position, providing sufficient data and information of great objectivity. It links to the underlying objectives of the economic institution, based on financial indicators and measures that would reflect the enterprise's success in a competitive environment. It helps to determine whether or not they meet customers' requirements and thus research ways to satisfy them (Marwa & Shima, 2021:30).

III: Financial Performance Measurement Indicators:

When measuring an enterprise's financial performance, several financial indicators are used to achieve the following objectives (Mohammed, 70-1: 2019):

1. Profitability and total asset management, where the users of the financial statements are interested in forecasting profits as these profits are the basis for increasing the value of shares, which encourage lenders to afford to lend their money to the enterprise, and which allows the enterprise to expand in the future.
2. Liquidity, i.e., an enterprise's ability to pay its debts on maturity dates and meet unforeseen cash requirements. Creditors are interested in liquidity because it essentially reflects the enterprise's ability to pay its outstanding pledges in a timely manner.
3. Financial risks, where management must effectively use debts and shareholders' investments without jeopardizing the future of the enterprise.
4. Managing the operation of assets, where managers must use current assets and obligations in a way that promotes income growth and sizes investments.
5. Market strength, that is, measuring an investor's perception of potential return and risks associated with equity ownership, is associated with the market price at which the company shares are bought and sold. In this regard, several financial indicators are used, most notably the share multiplier, the dividend yield, the common stock yield and the market value to the share's nominal value.

Cost Technique of TDABC

The Concept of Cost Technique of TDABC

As TDABC has been defined as a cost technique that helps the management of the economic unit to provide appropriate information through the use of resource estimates, (i.e.

the use of the time equation whereby it determines the time required to perform or carry out the activity), and is based on determining the energy used and untapped energy and thus determining the cost of the product more appropriately (Mozan, Hamidi, 5:2020).

Importance of Using TDABC

The importance of TDABC is due to (Jameel and Al-Hijan, 120-57: 2022):

TDABC can be well integrated with the data from ERP and CRM to become less people-driven and more dynamic.

1. TDABC can detect and try to avoid activities that do not add value.
2. TDABC is easy to deal with the company's strategic plans.
3. TDABC calculated for transactions is accurate through the use of time equivalents.
4. TDABC is easy to update and maintain through time equivalents with the assistance of ERP.

II: Steps to Apply the TDABC (Abdul Jawad. 20:2016):

- Determination of the various resource pools (departments) related to production.
- Determination of the total cost per resource pool (department).
- Determination of the practical capacity of each resource.
- Determination of the cost rate of the activity resulting from the breakdown of the total costs of resources over the practical energy.
- Determination of the time required for each activity.
- Calculation of the total costs of the activity by multiplying the unit cost by the time required for each activity.

III: Components of the TDABC

Cost orientations: The new TDABC procedure begins by estimating the cost of resource energy, identifying the different categories of resources that perform activities, for example the range of activities carried out by staff involved in customer demand management. In addition to identify frontline staff who receive and respond to customer requests and supervisors, and identify the resources they need to perform their tasks such as computers, communications, machinery, furniture, and human resources (Kaplan & Anderson, 2004:6). Whereas Laviana.et.al clarify the rate of cost or quantity used for each resource involved in the process which includes materials and staff. Moreover, the cost orientations consist of the total costs due for personnel, materials and equipment and the cost of the energy of all resources is calculated by splitting the full costs of supplying resources over the time available to staff, i.e. normal time and unused time or power is excluded (Laviana.et.al, 2016:3).

Time orientations: one of the information required in the cost technique of TDABC, is the estimate of the time needed to conduct activity operations and the assessment of the time required for the activity is done and obtained by direct observation or through interviews (Kaplan & Anderson, 2004:6). The main advantage of the technique of TDABC takes into account the handling of different time orientations as opposed to what exists in the traditional technique of (ABC), which considers only one activity directives (Bruggeman.et.al, 2005:14).

Time Equations (TEs): are one of the steps of TDABC. TEs are used to express the time of completion of an activity or event using time triggers, which are the compulsory representation used to predict the time needed to process an activity or event according to specific orders that correspond to the activity's features.

IV: Advantages of Applying the TDABC

By analyzing the TDABC, the following advantages can be revealed:

1. Reducing the number of activities used because TEs show the difference in orders and customer behaviour without any increase causing the complexity of the time model.
2. Providing appropriate information on costs and profitability in an expeditious and inexpensive manner, provide information on required resources and forecast demand.
3. It shifts management's attention to profit calculation and stocks value more than a system that cares about multiple and varied accounting techniques or procedures that consume a lot of time and good.
4. Fluidity of system update – TDABC (in case of changes in operational conditions such as increased number of activities) and also easy to update activity cost engine rates as changes in cost engine rates occur due to two factors (Kaplan & Anderson, 2004):

a) Changes in activities for available resources that affect the cost unit for the capacity of operational resources.

b) Changes in activity efficiency as a result of continuous improvement, process re-engineering, new production technology, or a better procedure in activity performance.

5. Management can have a clear view of the relationship between cost and activity because it shows - the amounts spent as a cost on the activity and therefore at the level of production or service, in such a way as to enable management to evaluate the relationship and move towards the affecting costs (Mohammed. 344:2016).

V. Criticisms to TDABC

Reflecting the system's reliance on the accuracy of time estimates, since it is time-consuming and costly to determine such estimates, especially because there are activities that are not essentially time-oriented, but rather based on orientations based on size factor such as mega-bytes or weight factor such as kilograms and that is, there is no obvious causal link between these activities and time orientations, Thus it cannot be included in this system (Nori and Hassan. 127:2020).

The possibility of not ensuring accurate assessment to measure the time required for each activity is subject to personal and discretionary judgement.

The problem of the cost of idle energy confirmed under this method was discussed in the accounting literature of the 20th century and today the cost of idle energy is excluded from production costs, as it is prepared for financial reporting purposes in conformity with international standards (Kazim, 272:2015).

TDABC's Role in Improving Financial Performance

TDABC's Role in Cost Reduction

Cost reduction is the primary objective of the in-house continuous improvement programme as the process of continuous improvement in the design of products or services that correspond to the consumer's wishes. It also means continued research on the products and services provided and related activities. In addition to demonstrate the weakness and strength of operational activities and to eliminate activities that do not assist in performance and lead to increased costs, as well as system information TDABC on cost reduction, for its continued focus on activities, and four ways to reduce cost are as follows (Abdulrahman, 960-931: 2020):

1. Reducing activity time, i.e. reduce the time and effort needed to perform the activity.

2. Excluding activities, and the activity is completely excluded (if the activity does not add value).
3. Selection of activities, achieving the choice of the least expensive alternative of different design alternatives.
4. Participation in activities means some changes that allow activities to be shared with multiple products to achieve economies of scale and cost.

When adopting the TDABC, the Foundation shall ensure that its costs are reduced by:

1. The application of the TDABC contributes to reduce production costs by its ability to detect and identify untapped energy and exclude its own costs.
2. The use of the TDABC for TEs helps the Department to predict the time needed for activities, identify more time-consuming activities and address technical deficiencies (ABC) and contribute to decisions that reduce the time required for activities, which will have a bearing on reducing costs for products.
3. TDABC provides competition for economic enterprises by providing more accurate information on costs.
4. In today's business environment, with strong competition, economic enterprises need modern accounting techniques as techniques help these institutions to survive by reducing costs and from these techniques, such as TDABC.

II: TDABC's Role in Measuring Quality Costs

TDABC is one of the latest approaches that seeks to integrate cost systems with the strategic dimension of the enterprise, and is concerned with the study, analysis and reduction of costs through the use of TEs.

Steps to measure quality costs using the TDABC approach are (Mohammed, et al. 477-459: 2019):

1. Identifying the different sets of resources (i.e. the necessary resources that perform activities for each department or section within the enterprise).
2. Estimating costs for each group. Direct costs are allocated directly to the cost of the product or service. Indirect costs are allocated to activities and these costs are included in the model.
3. Identifying the practical capacity of each group of resources (working hours available excluding breakdown times, meetings and training) through direct observation during the enterprise's enterprise process.
4. Calculating the average cost of a unit of time from each resource group by section {Total cost of the resource pool on the practical capacity of resources (hours)}.
5. Calculating the total cost of the measurement subject by multiplying the average unit time cost from the resource pool × the required time (s).

Thus, quality costs are properly measured and charged to the activities that cause them, and then to the products, contributes to the accurate costing of the products, thereby determining the proper matching of the product's income and costs. This contributes to the rationalization of management decisions as well as the proper measurement of the cost of each product at the enterprise level, and may be the interest of the enterprise to help it shape its future policies.

III: TDABC's Role in Achieving Competitive Advantage

Competitive Advantage Concept

Economic units actively strive to stay in the market and continue to operate, although this is not easily achieved, due to the unit's exposure to strong competition by other units. In

order to achieve their desired objectives, they must have a unique competitive advantage over other similar units (Al-Moussawi, 56-43: 2022).

TDABC supports the enterprise in increasing its competitive advantage by:

TDABC's Role in Cost Reduction

It helps the decision-making process, and the TDABC method provides useful information on the costs and profitability of the product (s) which can be used in the different decisions of pricing, mixing products, the decision to accept the order, adding or stopping a production line, improving processes, and reducing costs.....etc.). (Bijan, 23-11: 2019).

TDABC's method also helps accurate cost determination, support cost reduction efforts, improve management decision-making, and shed light on high-cost activities. (Al-Jabouri & Al-Tamimi, 133-95: 2016).

TDABC's Role in Pricing

TDABC is appropriate for the modern industrial environment, bearing the tapped energy costs used on products and excluding untapped costs and thus assisting in the process of pricing products in competitive ways that help economic units maintain existing customers and attract new customers (Ali, 405-374: 2018).

TDABC & its Impact on the Quality of Decisions

TDABC provides more accurate information on product costs than those offered by other cost accounting systems by removing the effects of untapped resources on production costs and is more reliable and better connected to make decisions. The adoption of this system provides three types of information for decision-making: (Abu Rahma & Hamad, 232-209: 2019):

- Information on costs spread over cost targets, which enables the enterprise to manage production costs through decisions to change products and outputs.
- Information on linking resource pools to cost pools. This type can reduce production costs by reducing or eliminating activities that do not add value.
- Information on the amount of unutilized resources and associated costs, which can improve its operational effectiveness by reducing the amount of unutilized resources either by deciding to increase and expand existing production or by reducing the amount of resources available to the enterprise and not affecting those resources. It is possible that the enterprise chooses to retain unutilized energy and future growth projects as a decision to introduce new types of products or expand into new markets (Kaplan R & S. Anderson, 2007, p13). In addition to the possibility of using the information provided by the TDABC directly for planning and budgeting objectives because of the system's focus on the economic use of resources.

Practical Aspect

This study describes the study community and its sample distributed to it in the questionnaire form, indicates the statistical methods used and tests hypotheses and includes the following aspects:

I: Description of the Community & Sample of the Study

The industrial sector plays a significant and effective role in the growth and development of countries' economies as a source of income from production and employment,

which causes an increase in the Territory's gross domestic product. Under these concerns, the study community consists of industrial economic units operating in the Kurdistan Regional of Iraq, as they represent a study community, is (14) industrial economic unit of the Territory. The sample of the study was determined by its scientific specifications, which achieve the study's purposes. The specialized study was made by Board Member, Director General, Director of Finance, Director of Management, Director of Production, Internal Auditor (Auditor), Accountant, Head of Department. For the purposes of the study the (90) questionnaires were distributed on the target sample of industrial economic units operating in the Kurdistan Regional of Iraq where the researcher used the random sample method, recovered (82) questionnaires of (91%). The following table details the distribution of the forms and the response rate as follows:

Table (1) *Classification & Details of Search Sample and Response Ratios*

C	Innovative Industrial Economic Units	Distributed Forms	Received Forms	% of Response
1	Al-Hayat Company for Soft Drinks & Mineral Water	12	11	91%
2	Rebas Poultry & Feed Company	6	5	83%
3	Shreen Water Plant	7	6	85%
4	Kosar Feed Plant	3	3	100%
5	Life Mineral Water Plant	6	6	100%
6	Rufian Mineral Water Packaging Plant	6	5	83%
7	Tian Healthy Water Plant	4	4	100%
8	Gamanki Mineral Water & Soft Drinks Production Plant (Maze Water)	7	6	85%
9	Zakho Dairy Production Plant	4	4	100%
10	Arbil Vid Feed Plant	4	4	100%
11	MAF Metal Pipe Production Plant	5	4	80%
12	Alco Aluminum Plant	12	11	91%
13	Al-Tnahi Plant for Production of BRC	5	5	100%
14	Almas Cement Industry Company	9	8	88%
11	**Total**	**90**	**82**	**91%**

Source: *Prepared by the researcher on the basis of interviews, distribution and return of forms from the investigated industrial economic units.*

II: Study Tool

The study tool is the research tool used to collect the necessary data on the phenomenon under study and to achieve the study's objectives. The researcher prepared a questionnaire and relied on it in the applied study with a view to collecting data and using the questionnaire, which is one of the most common methods in such a study. The questionnaire consists of two sections as follows:

1. General information, personal information about respondents (scientific qualification, scientific specialization, job title, number of years of experience).
2. It is the focus of the axis of study, consists of (34) phrases which distributed on two axes, the second axis is divided into three dimensions.

1) The availability of requirements for the application of the TDABC on the company.
2) The role of the TDABC in reducing production costs. The impact of this reduction is reflected in the company's performance economy.
3) The role of the TDABC in increasing resource efficiency in production and its impact on the efficiency of the company's performance.

4) The role of the application of the TDABC in rationalizing pricing decisions and its impact on the company's competitive advantage.

The Likert Scale was used to measure researchers' responses to the questionnaire phrases according to the following table:

Table (2) *Likert Scale Grades*

Response	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree.
Grade	5	4	3	2	1

III: Questionnaire Validity & Tool Reliability

The validity and reliability of the questionnaire were tested as follows:

Questionnaire Validity

To ascertain the questionnaire's apparent validity and veracity in terms of drafting and clarity, the researcher presented the questionnaire to a number of academic arbitrators and study specialists, consisting of (12) specialists in (Accounting and Management), as shown in Annex no. (1). Accordingly, the researcher responded to their views and made the necessary amendment by adding and deleting in the light of the arbitrators' proposals, thus finalizing the questionnaire and Annex no. (2) clarifying the final questionnaire distributed.

Questionnaire Reliability

This questionnaire is intended to give the same result if it is redistributed more than once and under the same circumstances and conditions. Also, to measure the reliability of the questionnaire the Reliability Analysis was used, and through the Alpha - Cronbach scale may be acceptable when this value is equal or greater than (0.60). For the purpose of ascertaining the accuracy of the measurement of the questionnaire variables, the researcher conducted a preliminary test of the questionnaire variables. Table (3) presents the results of the Reliability Coefficient of the phrase of the study variables:

Table (3) *Alpha - Cronbach Test for Questionnaire Reliability*

Dimensions and variables of study	Number of Phrases	Coefficient Value
Use of TDABC	10	0.984
Reducing production costs	8	0.987
Resource efficiency in production	8	0.984
Rationalization of pricing decisions	8	0.986
All questionnaire phrases	**34**	**0.98525**

Source: *Prepared by the researcher based on the results of the SPSS, 2022.*

We note from table (3) that the coefficient value of the first to fifth axis phrases is all within the questionnaire form (0.984-0.987), which is a high value compared to (0.60). This indicates the reliability of all the axes of the questionnaire form, and the reliability coefficients overall were (34) phrases equal to (0.98525), which is a high value indicating the overall reliability of the questionnaire.

In this light, the researcher ascertained the validity of the study's finalization, thus making him fully confident in the validity of the questionnaire and thus analyzing the results and the answers to the study's questions and thus testing their hypotheses.

IV: Statistical Analysis Methods Used in the Study.

In order to access certified indicators that support the study's objectives and hypotheses, the researcher consulted a specialist in statistical aspects to process data for the purpose of testing the study model and hypotheses. Data have been checked for classification and scheduling. The statistical programme (SPSS) has been used to analyse data and obtain results for all the axes used in the questionnaire. The following statistical tools have been used:

1. Alpha - Cronbach Test: Used to determine the reliability of questionnaire phrases.
2. Percentages and repetitions: To describe the study sample and know the frequency of study variable categories.
3. Determination coefficient: (R2) is used to determine the size of changes in the approved variable that can be explained by the change in the independent variable.
4. Simple correlation coefficient: This metric is used to verify the strength and type of correlation relationships between the dimensions of study variables.
5. Regression coefficient: used to identify and measure impact and relationships between study dimension variables.

V: Statistical Description of the Characteristics of the Study Sample

The demographic variables of the sample of the study can be described according to the data of the general information contained in the questionnaire and for all the study's purposes, as follows:

Table (4) *Statistical Description of the Characteristics of the Study Sample*

Distribution of respondents according to scientific qualification									
Bachelor's Degree		**Master's Degree**		**Ph.D.**		**Higher Diploma & More**		**Other**	
T	%	T	%	T	%	T	%	T	%
42	51.2%	15	18.3%	8	9.8%	14	1717%	3	3.7%

Distribution of respondents according to scientific specialization													
Accounting		**Financial & Banking Sciences**		**Statistics**		**Accounting Information Systems**		**Business Administration**		**Economy**		**Other**	
T	%	T	%	T	%	T	%	T	%	T	%	T	%
43	52.4%	14	17.1%	6	7.3%	0	0%	11	13.4%	4	4.9%	4	4.9%

Distribution of respondents according to job title															
Member of the Board		**Director General**		**Chief Financial Officer**		**Director of Management**		**Production Manager**		**Auditor**		**Accountant**		**Head of Department**	
T	%	T	%	T	%	T	%	T	%	T	%	T	%	T	%
2	2.4%	1	1.2%	13	15.9%	11	13.4%	9	11%	10	12.2%	28	34.1%	8	9.8%

Distribution of respondents according to total length of service									
Less than 5 years		5 - 10 years		10 - 15 years old		15 - 20 years old		20 years and over	
T	%	T	%	T	%	T	%	T	%
14	17.1%	26	31.7%	26	31.7%	9	11%	7	8.5%

Source: *Prepared by the researcher based on the statistical results of SPSS.*

Study Hypotheses Test

This research aims to analyze the study model and validate its hypotheses for identifying the correlation, impact and variability of study variables, using a number of statistical methods selected to conduct statistical analysis on study variables, as follows:

I: First & Second Hypotheses Test

Test and analyze the first hypothesis which states that "There is a statistically significant correlation at ($a \leq 0.05$) level between the TDABC and improve financial performance by reducing production costs.

The results of the coefficient analysis between the study variables and the aggregate indicator shown in table No. (5) Strong and positive statistically relationship between the two variables, at the macro level and at high levels, as the coefficient of correlation between the two systems is valued (TDABC) and between improving financial performance by reducing production costs to (0.954 * *) at a statistically level (0.05), the probability value was up to (p-value = 0.000) This result confirms that there is a correlation between the two variables from which it can be inferred that encouraging industrial economic units to apply this system improves financial performance by reducing production costs, as there is a statistically significant correlation at ($a \leq 0.05$) between TDABC and improving financial performance through cost reduction.

Table (5) *The correlation coefficient between the TDABC system and improving financial performance by reducing production costs.*

Approved Variable Independent Variable	Improving Financial Performance Through Cost Reduction	
TDABC	Correlation Coefficient 0.954**	(Sig) Probability Value 0.000
* * Statistically relationship at level (p-value ≤ 0.05) N = 82		

Source: *Prepared by the researcher based on the statistical results of SPSS.*

Analysis of the impact among the study variables: there is a statistically significant effect at the level ($a \leq 0.05$) for TDABC on improving financial performance by reducing production costs. The results of the simple linear regression model shown in table (6) indicate the impact of the independent variable "TDABC" on the variable adopted "Improving financial performance through cost reduction", as follows:

Statistically significant Impact of independent variable "TDABC" on Responsive or Approved Variable (Improved financial performance through reduced production costs) and at the aggregate indicator level, as the statistically level was valued (P-Value) calculated (0.000) is significantly lower than the virtual statistically significant level value adopted by the study, supported by the value of (F) calculated and amounting to (800.751) was greater than the tabular value and the (3.96) and degrees of freedom (81) indicating the statistically of the effect

and at the level (0.05). Based on this result, it can be concluded that there is a variable effect of TDABC on the variable to improve financial performance by reducing production costs. This indicates that the reliance of industrial economic units on the application of the TDABC affects the improvement of financial performance through the reduction of production costs. The results of the macro-level analysis indicate the following:

In the light of the regression equation, the constant value (B0) of (0.202) shows that there is an improvement in financial performance by reducing production costs by (0.202) even if the TDABC system is equal to zero. This finding can therefore be explained by the fact that improving financial performance by reducing production costs derives its characteristics and high levels from the application of the TDABC system in the investigated industrial economic units.

The marginal propensity (B1) was (0.954), indicating a change of one (1) In the TDABC variable, improve financial performance by reducing production costs by (0.954), a significant change that can be used to explain the impact of an independent variable (TDABC) in the approved variable (improving financial performance through cost reduction) statistically value at the statistically level (0.05).

The value (R2) was (0.909), which indicates that 90.9% of the change in financial performance by reducing production costs is due to the TDABC, i.e. the independent variable's interpretative value for the responsive variable was (90.9%). This result also indicates that the remaining impact ratio (9.1%) is due to the variables

Table (6) *Analysis of TDABC's impact on improving financial performance by reducing production costs*

Approved Variable Independent Variable	**Improving Financial Performance by Reducing Production Costs**			
	Fixed-B0	**B1**	**F**	**R2**
(TDABC)	0.202 t (1.584) Sig. (0.000)	0.954 t (28.298) Sig. (0.000)	800.751 Sig. (0.000)	90.9%
*** * High statistically when the probability value (Sig.≤ 0.05) F (81) = 3.96 N = 82**				

Source: *Prepared by the researcher based on the results of the statistical analysis SPSS, 2022.*

II: Third & Fourth Hypotheses Test

Test and analyze the third hypothesis which states that "There is a statistically significant correlation at the level (a ≤ 0.05) to the TDABC and between improving financial performance through increased resource efficiency in production.

The results of the coefficient analysis between the study variables and the aggregate indicator shown in table no. (7) a strong and positive statistically relationship between the two variables, at the macro level and at high levels, as the coefficient of correlation between the " (TDABC) "Improving financial performance by increasing resource efficiency in production to (0.961**) and at statistically level (0.05), the probability value was to (p- value = 0.000). As this result confirms that there is a synchronization between the two variables, it can be concluded that the effectiveness of the (TDABC) in industrial economic units improves financial performance through increased resource efficiency in production. Thus, validating the third sub- hypothesis, which provides for a statistically relationship for each (TDABC) and

improved financial performance in the market through increased resource efficiency in production.

Table (7) *The correlation coefficient between TDABC and improving financial performance through increased resource efficiency in production.*

Approved Variable Independent Variable	**Improving Financial Performance through more Efficient Use of Resources in Production.**	
(TDABC)	Correlation coefficient 0.961**	(Sig) Probability Value 0.000
*** * Statistically relationship at (p-value ≤ 0.05) N = 82**		

Source: *Prepared by the researcher based on the results of the statistical analysis SPSS, 2022.*

Impact analysis among study variables (there is a statistically impact at level (a≤ 0.05) for TDABC on improving financial performance through increased resource efficiency in production.

The results of the simple linear regression model shown in table no. (8) indicate the impact of the independent variable "TDABC" on the approved variable "Improving financial performance through increased resource efficiency in production", as follows:

Statistically impact of the independent variable (TDABC) on the responsive or approved variable (Improved financial performance, increased resource efficiency in production) and at the aggregate indicator level, with statistically value (P-Value) calculated (0.000) is significantly lower than the virtual statistically level value adopted by the study, supported by the value of (F) calculated and amounting to (959.926) was greater than its tabular value and excess (3.96) and degrees of freedom (81) indicating the statistically of the effect and at the level (0.05). Based on this result, the impact of the TDABC variant can be inferred in improving financial performance through increased resource efficiency in production, which indicates that the effectiveness of the application of TDABC in the research industrial economic units affects the improvement of financial performance through increased resource efficiency in production. The results of the macro-level analysis indicate the following:

In the light of the regression equation, the constant (B0) value of (0.122) shows that there is a strong motivation to improve financial performance by increasing resource efficiency in production even if the TDABC is equal to zero. This finding can therefore be explained by the fact that improving financial performance through more efficient resource use in production derives its characteristics and high levels from TDABC's presence in the investigated industrial economic units.

The marginal propensity (B1) was (0.961), indicating a change of one (1) in TDABC improves financial performance by increasing resource efficiency in production by (0.961), a significant change that can be used to explain the impact of the independent variable of the (TDABC) on the variable adopted to improve financial performance through increased resource efficiency in production, with a computerized (t) value (0.989) of statistically value at the level (0.05).

The value (R2) was (0.9230), which indicates that (92.3%) of the change in improving financial performance through increased resource efficiency in production is due to a (TDABC), i.e. the interpretative value of the independent variable in what happens to the

responsive variable has reached (92.3%), this result also indicates that the remaining (7.7%) impact ratio is due to other variables.

Table (8) *Analysis of TDABC's impact on improving financial performance through increased resource efficiency in production*

Approved variable	**Improving Financial Performance through Increased Resource Efficiency in Production**			
Independent Variable	Fixed-B0	B1	F	R2
(TDABC)	0.122 t (0.989) Sig. (0.000)	0.961 t (30.983) Sig. (0.000)	959.926 Sig. (0.000)	92.3%
*** * High statistically e when the probability value (Sig.≤ 0.05) F (81) = 3.96 N = 82**				

Source: *Prepared by the researcher based on the results of the statistical analysis SPSS, 2022.*

II: Fifth & Sixth Hypotheses Test

Test and analyze the third hypothesis which states that "There is a statistically significant correlation at level (a ≤ 0.05) between TDABC and improving financial performance by rationalizing pricing decisions.

The results of the coefficient analysis between the study variables and the aggregate indicator shown in table no. (9) a strong and positive statistically relationship between the two variables, at the macro level and at high levels, as the coefficient of correlation between the " (TDABC) "and" Improving financial performance by rationalizing pricing decisions" to (0.966**) and at the statistically level (0.05). The probability value was to (p- value = 0.000) As this result confirms that there is a synchronization between the two variables, it can be concluded that the existence of a (TDABC) in industrial economic units improves financial performance by rationalizing pricing decisions. Thus, validating the fifth sub-hypothesis, which provides for a statistically relationship between the (TDABC) as a modern technique in industrial economic units and improve financial performance by rationalizing pricing decisions.

Table (9) *Link factor between TDABC system and improve financial performance by rationalizing pricing decisions.*

Approved Variable **Independent Variable**	**Improving Financial Performance by Rationalizing Pricing Decisions**	
(TDABC)	Correlation Coefficient 0.966**	(Sig) Probability Value 0.000
*** * Statistically relationship at (p-value ≤ 0.05) N =82**		

Source: *Prepared by the researcher based on the results of the statistical analysis SPSS, 2022.*

Analyzing the impact among study variables (there is a statistically effect at level (a ≤ 0.05) for TDABC on improving financial performance by rationalizing pricing decisions.

The results of the simple linear regression model shown in table no. (10) indicate the impact of the independent variable "TDABC" on the approved variable "Improving financial performance through rationalization of pricing decisions", as follows:

Statistically impact of the independent variable (TDABC) on the responsive or approved variable (Improving financial performance through rationalization of pricing

decisions) and at the aggregate indicator level, as the statistically level was valued (P-Value) calculated (0.000) is significantly lower than the virtual statistically level value adopted by the study, supported by the value of (F) calculated value (1231.800) was higher than its tabular value (3.96) and freely (81) indicating impact statistically and at the level (0.05). Based on this finding, it can be concluded that there is an impact of the independent variable (TDABC) on the variable adopted to improve financial performance by rationalizing pricing decisions, which indicates that the existence of the TDABC in the research industrial economic units affects the improvement of financial performance by rationalizing pricing decisions. The results of the analysis at the macro level indicate the following:

In the light of the regression equation, the constant value (B0) of (0.110) shows that there is an improvement in financial performance by rationalizing pricing decisions and by (0.110) even if the TDABC is equal to zero. This finding can therefore be explained by the fact that improving financial performance by rationalizing pricing decisions derives its characteristics and high levels from the existence of the TDABC in the discussed industrial economic units.

The marginal propensity (B1) was (0.966), indicating a change of one (1) in the TDABC variable, change and improve financial performance by rationalizing pricing decisions by (0.966), a significant change that can be used to explain the impact of the independent variable " (TDABC) "On the adopted variable, improve financial performance by rationalizing pricing decisions, with a computerized (t) value (0.957) of statistically value at level (0.05).

The (R2) value (0.934) indicates that (93.4%) of the change in financial performance by rationalizing pricing decisions is due to the TDABC, i.e. the independent variable's interpretative value for the respondent variable is (93.4%). This result also indicates that the remaining impact ratio of (6.6%)

Table (10) *Analysis of TDABC's impact and improve financial performance by rationalizing pricing decisions*

Approved Variable Independent Variable	**Improving the Value of Products in the Market by Achieving Competitive Price**			
	Fixed-B0	**B1**	**F**	**R2**
(TDABC)	0.110 t (0.957) Sig. (0.000)	0.966 t (33.644) Sig. (0.000)	1131.945 Sig. (0.000)	%93.4
* * High statistically e when the probability value (Sig.≤ 0.05) F (81) = 3.96 N = 82				

Source: *Prepared by the researcher based on the results of the statistical analysis SPSS, 2022*

Conclusions and recommendations

This study addresses the main findings of this study:

1. The (ABC) needs a high cost of its application, as well as many data, details and handling of numerous activities and complex operational processes. This has highlighted the need for a new, easy-to-use, fast-to-apply and TDABC.
2. TDABC has several advantages that exceed ABC's, and has overcome most of the problems of applying ABC.
3. The introduction of TDABC has proved very useful in industrial units in the Kurdistan Regional, because it contributes to lower costs and thus helps improve product value.

4. The results of the study show the value of the coefficient of correlation between the variable (TDABC) to improve financial performance by reducing production costs to (0.954) and at a statistically level (0.05), and the probability value to (p- value = 0.000).
5. The results of the study show the value of the correlation coefficient between the TDABC variable and the improvement of financial performance by increasing resource efficiency in production to (0.96) and at a statistically e level (0.05), and the probability value to (p- value = 0.000).
6. The results of the study show the value of the correlation coefficient between the TDABC variable and the improvement of financial performance by rationalizing pricing decisions to (0.966) and at a statistically level (0.05), and reached the probability value to (p- value = 0.000).
7. The results of the field study revealed a statistically impact of the independent variable (TDABC) in the subordinate variable (improving financial performance through reducing production costs) at the aggregate indicator level, supported by the calculated (F) value (800.751) was greater than the tabular value of (3.96) and interpreted the TDABC (90.9%) of discrepancy in improving financial performance by reducing production costs, as explained by the determination coefficient (R2). The marginal propensity coefficient (B1) of a value of (0.954) indicates that the change in the TDABC in one unit will lead to a change in financial performance by reducing production costs by (0.954). (t) computerized was (1.584) which is a statistically value at the level (0.05), as shown in table no. (6).
8. The results of the study revealed the impact of the TDABC system on improving financial performance through increased resource efficiency in production, as the statistically level was valued (P-Value) calculated (0.000) is significantly lower than the statistically level value adopted by the study, and interpreted the TDABC (92.3%) of discrepancy in improving financial performance through improved resource efficiency in production, as demonstrated by the value of the determination factor (R2). Whereas the (B1) coefficient value (0.961) indicates a change of one (1) in the TDABC leads to a change in financial performance by increasing resource efficiency in production by 0.961. (t) computerized (0.989) which is a statistically value at the level (0.05) as shown in table no. (8).
9. The results of the study revealed the existence of the TDABC in improving financial performance by rationalizing pricing decisions as the statistically level was valued (P-Value) calculated (0.000) is significantly lower than the statistically level value adopted by the study, and interpreted the TDABC (93.4%) of discrepancy in improving financial performance by rationalizing pricing decisions, as demonstrated by the value of the determination factor (R2). The (B1) coefficient value (0.966) indicates a change of one (1) in the TDABC results in a change in improved financial performance by rationalizing pricing decisions by (0.966). (t) computerized (0.957) which is a statistically value at the level (0.05), as shown in table no. (10)

Recommendations

Based on the findings of the study reached in the first research, the researcher makes a set of recommendations in this study, which may be of interest, as follows:

1. The need to identify management decision makers in industrial companies in the Kurdistan Regional of Iraq with the benefits of applying the TDABC in improving financial performance.

2. The need to develop software that helps companies in the direction of applying modern strategic management accounting methods
3. The need for further studies on modern strategic management accounting methods in the industrial economic units of the Kurdistan Regional of Iraq.
4. Further specialized training courses on time-dependent cost allocation activities for employees and decision makers in industrial companies in the Kurdistan Regional of Iraq.
5. The need for industrial economic units in the Kurdistan Regional of Iraq to take care of the development of their cost systems in order to reach the delivery of products of high value and more accurately in the modern business environment.

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