Evaluating strategic performance based on measuring productivity linked to profit : A case study in the Iraqi Company for Engineering Works

Absrtact:

The research aimed to know the extent to which productivity linked to profit contributes to evaluating strategic performance as one of the financial methods of the company (Iraqi Engineering Works). The investigator employed the applied analytical methodology in the practical domain, as assessing the impact of productivity changes on existing profits was used to measure productivity linked to profit (productivity Neutral) (PQ) (for materials and labour) as one of the ways to evaluate changes in productivity for the years (2022-2023). This variable was measured using a program (Microsoft Excel 2010). The research concluded that the major role that profit-related productivity plays in improving the strategic performance of the economic unit is by using current inputs that provide a more accurate measurement of profit-related productivity than what is often known using Input prices for the base period to evaluate changes in productivity.

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Keywords: Strategic performance, Productivity Measurement Entries, effects of productivity changes on profit, productivity-related profit.

Introduction:

In light of the changes and developments taking place in the business environment, the speed of technological development, and the intensity of competition, the economic unit has sought to keep pace with these changes to achieve its goals, maximize its profits, and bear some responsibility towards society. It sought to improve its performance by developing plans and setting its long-term goals to implement the strategy and implement the optimal decision. Therefore, it has become necessary for economic units to adopt the strategic approach by setting long-term goals and visions and achieving them through the application of strategic management. To achieve these goals, economic units must evaluate their performance according to methods that rely on financial and non-financial indicators as inputs to achieve balance, similar to traditional tools that rely on financial measures only. To implement this strategy, it is necessary to create goods and services by converting resources into goods and services more efficiently. Which in turn leads to increased productivity and increased value added to the goods or services produced. Thus, the purpose of this research was to examine how productivity is linked to profit in order to assess the strategic performance of the economic unit that serves as the research sample. Although they are two different subjects, they are connected and crucial to the economy as a whole. Evaluating plans that specify how the economic unit aims to accomplish its objectives is related to assessing strategic performance. Productivity is directly related to the ability of the economic unit, the research sample, and is correlated with the efficient use of resources.

First: Research Methodology and Literature Review

1-Research Methodology

1-1 Research problem: from the above, we ask the following question:

How does measuring productivity linked to profit contribute to evaluating strategic performance?

1-2 Research objectives:

The following aims are sought for by the study:

a- Assessing the economic unit's strategic performance.
b- Measuring productivity linked to profit.
c- Knowing the extent to which productivity related to profit contributes to evaluating strategic performance as one of the important methods for evaluating performance in management accounting and strategic cost management.

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1-3 Research hypothesis:

The question above can be used to develop the research hypothesis:

Measuring productivity linked to profit contributes to evaluating the strategic performance of the economic unit.

1-4 The importance of research:

The following arguments demonstrate the significance of research:

a- **Scientific importance**: The study's scholarly significance arises from the paucity of prior research on the topic of assessing strategic performance using a productivity metric connected to profit. Consequently, the study is seen as a scientific addition to the body of knowledge that this kind of research adds to the scientific library.
b- **The practical importance is as follows**:
    - Its importance is highlighted in achieving strategic performance evaluation as one of the long-term plans that contribute to the continuity of the economic unit by preserving economic resources, making it consume the least amount of costs, energy and resources.
    - Enhancing the competitiveness of the economic unit.
    - Providing the foundations that enable the company (the field of research) to realize the importance of measuring productivity linked to profit and its role in achieving the continuity of the economic unit.

1-5 Limits of Research:

Among the boundaries of temporal and spatial inquiry are the following:

a- territorial bounds: The business Iraqi For Engineering Works, which is listed on the Iraq Stock Exchange in Baghdad, served as a representative of the research's territorial boundaries.
b- Temporal limitations: Since the researcher had access to the financial data, the data for the years 2022–2023 were used.

1-6 Research Methodology:

Applied analytical approach: From a practical standpoint, the researcher relied on the applied analytical approach since one way to evaluate changes in productivity is to analyze the impact of those changes on current profits, which is a variable that the program measured (Microsoft Excel 2010).

1-7 Sources of data collection and information:

a- **Theoretical aspect**: The theoretical aspect of the study has been relied on what is available from Arab and foreign sources represented by books, letters, university theatre and periodicals available in libraries or on the international internet related to research.
b- **The practical side:** The researchers relied on several ways to obtain data and information related to the topic of research, which are as follows:

- Financial reports and statements released for the study sample by the Iraq Stock Exchange, including cost and financial information.
- Reports issued by departments and divisions of the company sample research.
- Personal interviews with employees.

1-8 Community and sample research:

The Iraqi engineering works firm that is listed on the Iraq stock exchange, represent the research community.

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1-9 Justifications for selecting the research:

Among the most important reasons that prompted researchers to choose the research topic lies in the following points:

a- Absence of studies addressing this topic.
b- Encouraging Iraqi economic entities to utilize global techniques and frameworks for strategic performance assessment.
c- The status and importance of the topic at the global and local levels due to the growing interest in the topic of evaluating the strategic performance of economic units.

Through this research, the objectives of the research, the problem and the research hypothesis were determined, as the researchers seek through this research to achieve the objectives, find an answer to the research questions, and prove the hypotheses.

2- Literature review

This section deals with the most important previous literature that provided the theoretical side with the most important information that covered the research variables:

The first variable: strategic performance evaluation:

1. **A study (Al-Mutairi, 2022) entitled (Integration between the activity-based costing method and economic value added as a proposed input for evaluating strategic performance)** The current study aimed to analyze the impact of integration between the activity-based costing method and economic value added as a proposed input for evaluating strategic performance, by conducting a field study on a group of Kuwaiti business establishments. The research concluded, through statistical analysis of hypothesis tests, that evaluating the strategic performance of Kuwaiti business establishments in light of the integration between the activity-based costing method and the added economic value requires the availability of many requirements, including special requirements for applying the activity-based costing method and special requirements for using the economic value-added. In addition, there are some requirements for achieving integration between the activity-based costing method and the economic value added to ensure the strategic evaluation of these facilities in a sound manner.
2. **There is a lot of literature that has dealt with a common topic, including (Abdul Rahman et al., 2022) entitled (The Role of the Balanced Scorecard in Evaluating Strategic**

Performance), and (Juad & Kahit, 2023) entitled (Using the Balanced Scorecard in Evaluating Strategic Performance), and (Abdul Hassan & Maktuf, 2024) (Using hierarchical analysis to apply the balanced scorecard in evaluating strategic performance).

The second variable: measuring productivity:

1.(Chen, et al, 2021) entitled **(The risk-adjusted profit productivity change in Chinese banks: A comparative analysis of the different type banks)**

Incorporating a risk component into the profit-oriented productivity change framework, this study breaks down the measure into adjustments to allocative inefficiency, technical inefficiency, technology, and pricing impacts. To analyze the profitability and performance of Chinese banks, we selected 43 Chinese banks as a sample between 2015 and 2019. It is discovered that all Chinese banks have significantly increased their productivity in earnings, with technical deterioration accounting for the majority of their earnings loss. Chinese city banks had the largest growth in profit productivity, but state-owned banks have greater profit efficiency. The primary contribution is that ownership can influence production-related factors like changes in technology and technical inefficiencies but cannot influence profit productivity.

2. (Abramov, et al, 2024) entitled **(Total factor productivity of Russian companies: A study at micro level)**

Total factor productivity (TFP) is a critical measure of efficiency and a driver of economic growth. Using micro-level data on Russian firms, this study analyzes TFP changes at the firm, industry, and ownership type levels across eight industries (agriculture, mining, manufacturing, energy, water supply, trade, transportation, information, and communications) over a year (2012-2020). At the micro level, factor productivity in Russian companies decreased on average by -7 percent. The productivity gap between large and small companies increased by 34 percent. The study revealed heterogeneity in growth rates and productivity levels between groups of companies, whether by industry or ownership. With the general trend towards declining productivity, the widening productivity gap becomes a worrying indicator. The results serve as a basis for further quantitative multi-factor analysis and allow identifying companies that have the potential to increase the rate of economic growth in Russia.

The third variable: Strategic Performance Evaluation and productivity measurement:

1- Study (Kang & Ju, 2018) entitled **(Integrated Analysis of Productivity and Machine Condition Degradation: Performance Evaluation and Bottleneck Identification).**

Degradation of machine condition is frequently seen in production systems. It has been demonstrated that machines may fail in several probabilistic ways depending on their running state. Furthermore, machines in worse operational condition have a higher chance of failing, which would result in frequent downtime and lower system productivity. To help with operational decision-making on the factory floor, analytical techniques to assess the possible influence of machine deterioration on overall system performance are currently lacking. In this research, we examine a Markovian decomposition process-following sequential manufacturing line with several machines and a restricted buffer. The system's overall performance and its interactions with the machine state process are to be ascertained through an integrated model built on the assembly approach. In addition, an analysis is conducted on system characteristics to determine how system parameters affect system performance. Furthermore, three

categories of bottlenecks were recognized, and the indicators that corresponded to them were extracted to offer recommendations for enhancing system efficiency. By combining productivity and machine condition degradation, these techniques offer quantitative tools for modeling, analyzing, and improving production systems.

2- **Study (Shroufa, et al, 2020)** entitled **(A study on relationship between human resources and strategic performance: The mediating role of productivity)**

From the perspective of senior management managers and managers of functional units (human resources, marketing, finance, and accounting), the study sought to determine the mediating role of the productivity of the banking sector in Jordan based on the relationship between human resources and strategic performance. HR-related activities were used to gauge human resources. The 26 commercial banks in Jordan are represented in the research population as of right now. Based on previously published research, a survey questionnaire was created, and information was gathered from 371 respondents working for the targeted banks. The required tests are carried out utilizing to guarantee validity and dependability. PSYCHO The findings show that productivity and strategic performance were positively impacted by human resources. The findings also showed that productivity acts as a positive mediator in the relationship between commercial banks' strategic performance and their human resource allocation.

What distinguishes the current research from previous literature:

The current research is distinguished from previous literature studies by focusing on measuring productivity linked to profit for the purpose of evaluating strategic performance, as not all previous studies studied productivity linked to profit and the extent of its contribution to evaluating strategic performance.

Second section: The theoretical framework

2-1 Evaluation of strategic performance:

Many companies seek to excel in their efficient and effective performance in order to achieve their strategic goals, especially in light of the intense competition they face in the markets. This requires economic units to develop a strategic framework that includes their long- and short-term vision and goals, and to analyze the opportunities and threats they face in their external environment. In addition to extracting strengths and weaknesses from its internal environment and thus adopting the appropriate strategy and working to implement it at all levels in an integrated manner to reach strategic performance that achieves distinction over competitors. Therefore, we find that performance from a strategic perspective is closely linked to competitiveness and expresses the strength of the unit. The economic system is able to continue as desired in an advanced competitive market, that is, by achieving efficiency, knowledge and effectiveness at the same time, which reflects its ability to activate its strategies and confront forces.

Based on the above, we will discuss during this part the concept of strategic performance evaluation, its dimensions, and indicators for measuring strategic performance.

2-1-1 The concept of strategic performance evaluation:

There are many concepts that express strategic performance. Ansoff & McDonnell defined it as "performance that achieves a balance between the requirements of survival in the short and long term according to indicators of the economic unit's life cycle and its profitability." (**Bin Al-Din, 2018: 12**) (**Wheelen & Hunger, 2015:329**) interpret it as "the process of comparing the results obtained with the desired results, giving the required performance feedback to assess the results, and making the necessary modifications." (**Ramadan & Hanouna, 2023: 4**) defined the concept of strategic performance evaluation as "Consistency, internal cohesiveness, and a strong capacity to comprehend the actual state of the economic unit through the provision of information and data stated in both quantitative and qualitative criteria are necessary to guarantee the successful execution of the strategy and the accomplishment of the objectives of the economic unit.." It is also defined as "performance that achieves a cumulative and comprehensive knowledge building and reflects the level of success of the economic unit and its ability to adapt to the environment, growth, continuity, and represent policy standards." (**Abdul Hassan & Maktuf, 2024: 7**)

The economic unit should have a thorough understanding of its industry before developing a plan. Five forces are the main subjects of industry analysis: (1) rivals; (2) possible new entrants; (3) comparable products; (4) customer bargaining power; and (5) input supplier negotiating power. The economic unit's capacity for profit is shaped by these forces (**Datar & Horngren's, 2021: 537**).

2-1-2The importance of strategic performance evaluation:

1. Finding processes that work effectively and comparing them to areas that require improvement; creating policies that support the manager's ability to keep managing and developing different processes; and identifying processes that fall short of expectations. (**Heizer et al, 2020: 432**).

2. Stability or rigidity, as well as organizational adaptation, are indicators of strategic performance. Adaptation of the organization is associated with quality, while consistency is associated with lower costs (**Rabi'awi et al., 2018: 313**).

2-1-3 Indicators for measuring strategic performance:

The financial perspective is one of the most important axes for measuring and evaluating performance, and the result of this perspective represents measures directed towards achieving goals and determining the level of profits achieved for the economic unit's strategy (**Hajjaj & Ranno, 2015: 139**).

Among the most important strategies for the financial axis: (**Kaplan & Norton, 2001: 90-93**)

1. Strategy for increasing revenue: There are two ways to increase revenue:
   a- Establishing a unique service relationship that brings in extra money from newly introduced clients and market-related services.

   b- Increasing the services provided to current clients by getting to know them better, attempting to fulfill their desires, and determining the best combination of goods and services to offer.

2. Productivity growth strategy: In order for there to be effective productivity, there should be one or more correct ratios of outputs to inputs. Productivity expresses the relationship between inputs and outputs. Increasing productivity inside the economic unit can be accomplished in a few ways:

a. Improving the cost structure by keeping product quality constant while cutting direct and indirect expenses.
b. Effective use of assets: This entails lowering the amount of fixed and working capital needed to achieve the necessary operational level.

Second: Measuring productivity: the concept, definition and types of productivity, approaches to measuring productivity.

2-2-1 The concept and definition of productivity:

The relationship between outputs and the inputs needed to make them is a specific focus of productivity, which is the efficient production of outputs. Generally, a particular amount of output can be produced by utilizing several combinations or combinations of inputs.

(**Stevenson, 2021: 56**) characterized productivity as (a ratio of outputs to inputs, typically stated as a measure of the efficient use of resources).

There are those who define it as "the ratio between the production measure and the input measure." (**Sauermann, 2023:2**).

Thus, worker productivity can be measured as outputs, for example, sales or units produced, compared to inputs.

2-2-2 Entries for measuring productivity:

Partial productivity, multifactor productivity, and total productivity are the three types of productivity measurements that can be based on one, multiple, or all inputs. Measures of productivity are shown in Table 1 below. The primary consideration when selecting a productivity measure is the intended use of the data. Labor becomes the logical input metric if tracking increases in labor productivity is the objective.

Table (1) productivity measures

One input (with a limited throughput)	$\frac{Output}{Labor}$	$\frac{Output}{Machine}$	$\frac{Output}{Capital}$	$\frac{Output}{Energy}$
More than one input (multi-factor productivity)	$\frac{Output}{Labor + Machine}$		$\frac{Output}{Labor + Capital + Energy}$	
All inputs (total throughput)	$\frac{Goods\ or\ services\ produced}{All\ inputs\ used\ to\ produce\ them}$			

Source: (**Stevenson, 2021: 57**)

Third: Measuring productivity linked to profit:

One method of assessing productivity increases is to look at how they affect present earnings. From the base period to the current quarter, earnings vary. Productivity changes are partly to blame for this shift in earnings. It is defined as measuring the change in profit that may be attributed to a change in productivity (**Hansen, et al, 2009:537**). In order to assess strategic effectiveness, productivity changes are linked to profits, as will be discussed in the following portion of this paper.

The third: the practical aspect

First: Research sample: The Iraqi Company for Engineering Works:

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3-1-1 An overview of the company's founding:

a. The Iraqi Pastries Company, a mixed joint stock company formed in 1985 under Companies Law No. 36 of 1983, was incorporated with a capital of eight million dinars, split into eight million shares.
b. The name and activity of the company were changed in the first and fourth paragraphs of the articles of incorporation to become the Iraqi Company for Engineering Industries - Mixed Joint Stock - according to what was stated in the decision of the company's general assembly at its meeting held on 9/28/1988.

3-1-2 company activity:

The table below shows the company's activity

Table (2) Company activity

Product name	unit of measurement
heavy gasoline	Kit
medium gasoline	set
Daskat	set
Kaljat	set
Atypical production	piece
filters	piece

Second: Measuring productivity linked to profit:

This section examines how productivity is measured in relation to profit in order to assess the Iraqi Engineering Works Company's strategic performance. The profit linkage rule states that the cost of inputs that would have been required even in the absence of a productivity shift would be determined and contrasted with the cost of the inputs that were actually used. The amount that changes in earnings as a result of productivity variations is determined by the difference in costs. The actions listed below will be taken in order to implement this rule:

1. It is necessary to compute the inputs that, in the absence of a change in productivity, could have been used for the current period.
2. Determine the value of (PQ), which is the amount of inputs that have no effect on output. The output for the current period is divided by the input's base period productivity ratio to find the neutral quantity of productivity, as shown in the following equation:

$$\text{Productivity neutral input quantity (PQ)} = \frac{current\ period\ productivity}{base\ \ period\ productivity\ ratio}$$

To clarify the application of the rule related to profit, rely on the table below regarding cost information and descriptive data for the economic unit and for the years (2022-2023) as follows:

Table (3) cost information and metadata

Item	2022	2023
Number of units produced (pieces)	1033	12451
working hours used	1500	12200
Materials used (pieces)	5165	64745
Unit selling price (thousand dinars)	3.5	3.5
Wage per working hour (thousand dinars)	1.7	1.5
Cost per unit of materials (thousand dinars)	1.25	1.5

The researcher created the table using the economic unit's financial data. The present production for (2023) is 12,451 pieces. According to Table (4) below, it shows that the productivity ratio for the base period is (0.2, 0.69) for materials and labor, respectively.

Table (4) productivity measurement

Partial operational productivity ratios	2022	2023
material productivity rate	0.2	0.19
labor productivity rate	0.69	1.02

Material: 12451/64745 working: 12451/19000

Material: 1033/5165 working : 1033/1500

With this data, the following formula is used to get the neutral quantity of productivity for each input:

Neutral quantity of materials (PQ)= $\frac{12451}{0.2}$ = 62255 pieces

Neutral quantity of work (PQ) = $\frac{12451}{0.69}$ = 18044 hours

(PQ) provides the labor and material inputs that, under the assumption of no change in productivity, might have been employed in 2023. The productivity-neutral quantities' potential cost in 2023 is computed by multiplying their individual input quantities (PQ) by their respective present prices (P).

Material cost: PQ*P = 62255*1.5 = 93383

Labor cost: PQ*P = 18044*1.5 = 27066

Total cost (PQ) 120449

The actual quantity (AQ) times the current input price (P) for each input yields the real cost of inputs, which is as follows:

Material cost: AQ*P = 64745*1.5 = 97118

Labor cost: AQ*P = 12200*1.5 = 18300

Total current cost 115418

Lastly, the following formula is used to determine the impact of productivity on profits: deduct the total current cost from the total (PQ) cost:

The effect of productivity on profits = total PQ cost - total current cost = 120449 – 115418 = 5031 increase in profits

Findings:

Table (5) below summarizes the findings of analyzing productivity changes linked to profit and its impact on strategic performance evaluation.

Table (5) Measurement of productivity linked to profit

Input	(1) PQ	(2) PQ*P	(3) AQ	(4) AQ*P	(2) – (4) (PQ*P) - AQ*P)
Materials	62255	93383	64745	97118	(3735)
labor	18044	27066	12200	18300	8766
		120449		115418	5031

The process change had a net positive effect, according to the summary in Table (5). Changes in productivity resulted in a 5,031 dinar rise in profits. It is worth noting that the impacts of profit on productivity might be attributed to certain inputs. earnings increased by 8,766 dinars as a consequence of higher labor productivity; however, earnings decreased by 3,735 dinars as a result of lower material productivity. The majority of the drop in earnings was caused by the increased usage of materials; it is evident that the new procedure resulted in considerably higher waste, scrap, and ruined units. Thus, in addition to the impact of the aggregate measure, the profit-related measure offers partial measurement effects: The total of the separate partial measures of productivity is the overall profit-related measure of productivity. Because of this characteristic, the profit-related measure is perfect for weighing trade-offs. Even if the new process generates a lot of trash and residue, it's feasible that further gains in labor productivity can still be seen because the new process' learning effects haven't been fully internalized. Material utilization may decrease in the new process as labor efficiency rises.

From the above, it can be said that measuring productivity linked to profit contributes to evaluating the strategic performance of the economic unit.

Fourth topic: conclusions and recommendations

4-1 Conclusions:

The current section presents the most important conclusions reached through the following points:

1. Profit-driven productivity will have a favorable impact on strategic success.
2. The study came to the conclusion that increasing productivity that is correlated with profit is crucial for enhancing strategic performance.
3. To assess changes in productivity, base period input prices are frequently utilized. On the other hand, it has been demonstrated that current input prices offer a more precise indicator of productivity in relation to profit.

4-2 Based on the discussions and findings of this study, it is possible to reduce the use of material for any economic unit, which ensures the quality and quantity of production over time and creates a successful and reliable culture within the economic unit. This can be done by integrating new programs, policies, and practices while increasing labor efficiency in the production process.

4-3 Recommendations:

1. Focus on measuring material productivity for the purpose of rationalizing waste, scrap, and materials that are not suitable for production as a result of the increased use of materials.
2. Encouraging Iraqi economic entities to optimize the advantages of calculating productivity correlated with profit, as this can greatly enhance the economic entity's worth over an extended period.
3. Focus on current input prices, which provide a more accurate measurement of productivity linked to profit.
4. Measuring intellectual assets descriptively, performanceally and financially in economic units as the most important mechanism at the present time for evaluating and managing strategic performance without focusing on measuring productivity only.

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