How Important is the Application of Balanced Scorecard, Benchmarking and Data Envelope Analysis Techniques in Measuring Performance Efficiency in Private Banks/ Applied Study

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Abstract: In view of the continuous developments and changes in the competitive business environment, the importance of Strategic Management Accounting is highlighted in the great role it plays in various economic units in terms of measuring the efficiency of performance on the one hand and evaluating it on the other, and comparing the efficiency of its performance with another leading economic unit in the same field. This research is aimed mainly at identifying the importance of some strategic management accounting methods (BSC balanced scorecard, BM Bench Marking) as well as the quantitative method of Operations Research Methods, which is the method of data envelope analysis (DEA) and their role in measuring the efficiency of performance in Iraqi private banks (al Mansour Investment Bank, Commercial Gulf Bank, Middle East Bank, National Bank of Iraq) and for the period of time (2015-2019) during the fixed volume returns model (CCR) method of data envelopment analysis, as well as the comparison between the banks of the research sample, and used the researcher descriptive analytical in financial ratio analysis that was used in the Balanced Scorecard, as well as statistical methods that have been used for data processing (arithmetic mean, median, token, bow, architecture, variance, range).The researcher reached a series of conclusions, most notably that the results of the statistical analysis showed that there is a relative difference in relative efficiency according to the perspectives of the balanced scorecard and for different years. There is a near-equal in the computational circles of the financial performance of the research sample banks. The results of the statistical analysis showed that there is a close relationship between the Balanced Scorecard binoculars and the data envelope analysis method, the latter complementary to the Balanced Scorecard work in measuring performance efficiency.

Keywords: Balanced Scorecard, Benchmarking, Data envelope Analysis, Performance Efficiency.

1. Introduction

Interest in measuring and evaluating the efficiency of the performance of banks in different countries of the world has increased in recent times as a result of developments in the banking environment, and many methods used in measuring and evaluating banking efficiency have emerged, and one of these methods is the Balanced Scorecard method, which is one of the most important and prominent modern methods in The Balanced Scorecard method can be considered as a tool through which the strategy is formulated and the vision of the economic unit in addition to being a tool through which the strategy is translated into clear goals that are easy to understand and the objective of the Balanced Scorecard lies in the balance between the organizational vision of the economic unit on the one hand and the strategic.And the method of Benchmarking, which is an organized and continuous process through which to evaluate the performance of the economic unit, or evaluate one aspect of this performance and this is done through comparison with another model, whether this is inside the economic unit or outside in order to identify the justification and the reasons related to the gap, and work to address Some argue that comparative measurement is the most powerful and important method that economic units must follow in order to measure and improve their levels of performance.In addition to the method of data envelope analysis, which is a technique that uses linear programming by determining the optimal combination of inputs and outputs for administrative units with similar objectives, and this is based on the actual and real performance of these units is also considered to have a great role in measuring the efficiency of performance through its multiple models. efficiency, and be that either hand) Input orientation (or in terms of output orientation), the reason why this method is called data envelope analysis is because the units with full administrative efficiency are in the foreground and encapsulate all other inefficient units and on this basis the data encapsulated in the foreground is analysed

2.Research method

2.1.Balanced Scorecard

The data used in this study are annual reports obtained from (2) of the Iraqi private banks (Mansour Investment Bank, Commercial Gulf Bank) of the period (2015-2019).

2.2. Feature Selection

In order to measure the efficiency of performance there are many methods that can be used in measurement, from traditional methods based on financial indicators only to modern methods and their financial and non-financial indicators, and the success of any measurement process is related to the possibility of the economic unit to use methods and performance indicators that serve the demands of all, and It measures the efficiency of the performance of the economic unit well, in order to focus on different perspectives that combine financial and non-financial indicators represented by the four basic perspectives (financial perspective, customers, internal processes, learning and growth) as well as internal and external factors and short and long term. Then comes the method of data envelope analysis, which is also one of the important methods in measuring the efficiency of the performance of the economic unit, to complement what the Balanced Scorecard started and then the reference comparison.

3. Technical background

3.1.Balanced Scorecardtechnique

The balanced scorecard is the first systematic work that has tried to design a system that measures and evaluates the performance, which pays attention to translating the strategy of the economic unit into goals, metrics and standards to be targeted in addition to continuous improvement steps, and it is based on the standardization of all the metrics that the economic unit uses, in addition to This is done through the financial and non-financial metrics of the Balanced Scorecard.The reason for calling it a balanced scorecard is because it consists of both metrics (financial and non-financial) It measures the current and future financial performance of the economic unit Provide a strategic communication plan that connects the senior management of the economic unit with the individuals who work in it**,** The Balanced Scorecard has seen many developments and that this development that followed it since the nineties was through three generations, after noticing the economic units of the existence of unsatisfactory and meaningful reasons for the performance of the balanced scorecard where it began to use the Balanced Scorecard as an administrative system and not as a specialized system in the development of performance only :[2] [3]

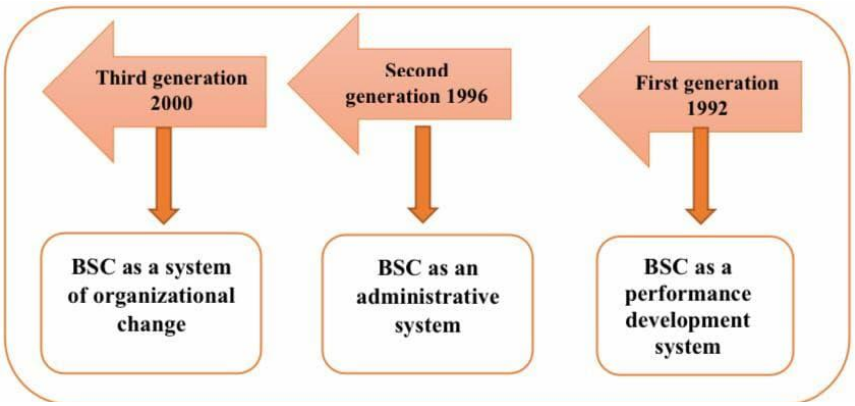

Figure .1 The Three Generations of the Balanced Scorecard

3.1.1. Basic dimensions of the Balanced Scorecard

The Balanced Scorecard consists of 4 basic dimensions:

1. Financial dimension: the financial dimension is one of the dimensions of performance measurement and evaluation in the balanced scorecard and the results of this dimension represent the metrics and indicators directed towards achieving the goals.
2. Customer dimension: as the Balanced Scorecard has taken into account the needs and desires of customers and their requirements by containing the customer dimension, the focus on these objectives, the achievement of which represents the achievement of the strategic objectives of the economic unit.
3. Internal processes dimension: internal processes are the essence and the important element in the formation of performance and competitiveness, as within the framework of the aggregate of these processes and their preferences, the ability and potential of the economic unit to perform and achieve the goals.

4. Learning and growth dimension: economic unit is educated, if it learns and develops through its experiences and experiences in putting the ideas of employees and management into practice and where education is associated with positive change in individual, group and organizational behaviors.[4]

3.1.2.Steps of balanced scorecard numbers

The Balanced Scorecard count process includes a set of steps that can be determined by seven steps as follows**:**

1. First step: define the vision and mission of economic unity.
2. Step Two: determine which strategies to follow and which things to focus on.
3. Step Three: identify the key elements of success by identifying the things to focus on in order for economic unity to succeed.
4. Step four: Determine Measurements by determining what to measure.
5. Fifth step**:** define and develop the business plan by formulating goals and developing the business plan.
6. Step six: identify executive actions, i.e. identify actions that must be initiated to achieve the goals.
7. Step Seven**:** follow-up and design by determining how the follow-up process will be conducted and modifying the card content.[13] [6]

3.1.3. Balanced scorecard characteristics

There are six characteristics of the Balanced Scorecard:

1. The Balanced Scorecard combines four different perspectives on the performance of economic units, which relates to the many disparate elements of customer orientation, shorter response time, better quality, and emphasis on teamwork.
2. - It categorizes each perspective into five key elements (strategic objectives, metrics and indicators, targets, initiatives, and actual values).
3. It explains the strategy of economic unity and the sequence of cause-and-effect relationships, which represent the links between the different perspectives that serve to describe how the strategy will be implemented and each measure in the balanced scorecard is part of the cause-and-effect chain from the formulation of the strategy to the financial results.
4. The Balanced Scorecard works to communicate the strategy to all members of the economic unit, by translating the strategy into a coherent and coherent set of operational objectives that are understandable and measurable and through the scorecard managers and employees take actions and make decisions to achieve the strategy.
5. The Balanced Scorecard limits the number of metrics and identifies only those that are most important in order to focus managers ' attention on those metrics that affect strategy execution.
6. It assists management in checking performance and making necessary adjustments through the strategic implementation process even if substantial adjustments are required through enhanced learning and feedback.[8]

3.2.The Benchmarking technique

The Benchmarking technique is the process by which the economic unit can identify the success factors, and then be compared with the best practices of other economic units, or with other departments that are within the economic unit until all the success factors are achieved, and is also considered an uninterrupted and continuous process in comparing the activities and work of an economic unit.[12]

3.2.1.Types ofThe Benchmarking technique

There are several types of reference comparison that can be explained thus:

1. Internal Benchmarking: - this type shows that the economic unit compares each section within this unit with other similar and similar sections according to certain standards, in addition to improving the internal work according to the most good and High Efficiency Unit based on internal standards, and the required information is collected through various measurement tools and that this type of comparisons is the easiest Self-reference comparison is one of the types of internal reference comparison, where the economic unit compares its current performance with the performance of previous years, and the benefit of this type lies in enabling the economic unit to know the status of its performance and whether it is in continuous improvement or decline in performance or stability.
2. External Benchmarking:where the activities and performance of the economic unit are compared with other economic units are similar to them in the activity in the competition environment according to specific criteria, in order to obtain information related to the work of competitors.[1]

It can be divided into several types case:

- Competitive comparison: the comparison in this type is between an economic unit and other similar economic units and competition to it and sometimes it is local or global, and this is done through the collection of information and data by direct mechanisms that are done by concluding agreements with similar economic units or through mechanisms that are indirect and of
- Operational Benchmarking: in this type of comparison between two units that have the same activity, for example, performance is compared (University with another university, hospital with another hospital, Bank with another bank or hotel with another hotel).
- Strategic Benchmarking: where this type of comparison looks and examines the superior strategies that led to competitive advantage and high academic success, then you identify the strengths and weaknesses of the unit where the comparison or who do the same activity where it is an important step in the numbers of improvement priorities and come up with new ideas that will contribute to
- Cooperative Benchmarking: this type is carried out by economic units among themselves, that is, they exchange data and information in addition to performance indicators, where they are provided support to each other and support among themselves.
- Benchmarking Financial: where builds this type on the basis of comparison in financial aspects, for example (compared to budget with the merits of the spent efficiently or methods of organization that come through different revenue sources or ways to avoid financial goal).[6] [12]

3.2.2.Importance ofThe Benchmarking technique

The Benchmarking method is one of the most important methods that can be used effectively to conduct improvement and development in the performance of the economic unit, by identifying the gap in performance between it and the leading economic unit and trying to eliminate this gap and promote a better level of performance: [14].

Table.1. importance of reference comparison

Before applying the Benchmarking method	After applying the Benchmarking method
There's no creativity.	Apply new ideas
One solution to the problem	Multiple options
Internal concentrations	External concentrations
Low understanding of the market	High level of understanding of the market
Internal priorities	Customer priorities
Responsive improvements	Proactive improvements
Focus on problems	Focus on opportunities
We're good.	We need to be the best
Managed by experience	Managed by facts

3.2.3.requirementsofThe Benchmarking technique

There are many requirements for the method of reference comparison, which are the basis of success and achievement of the goals aimed at the economic unit and can be explained by the following:

1. To communicate and link operations with strategic objectives in addition to changing the idea of objectives to a broader and broader perspective of the improvement process to reach the level of ambition.
2. Create a distinguished team characterized by the great potential for reasonable and logical thinking
3. Taking into account and taking into account the principles and behaviors of reference comparison with respect to trust or the principle of communication at the level of the parties or even the introduction of a third party
4. Promoting and developing the learning culture within the economic unit in addition to continuing to monitor the performance and motivate the employees in the economic unit until they reach the stage of conducting comparisons, and forming special committees for supervision and institutional framework where these are the most important requirements.[2] [15]

3.3. The data envelope analysis technique

The data envelope analysis techniquea quantitative process research tool, used to measure productivity efficiency by determining the optimal combination of a set of inputs and outputs of administrative units that are similar in objectives and events, to determine the level of relative efficiency of each unit to the group of other units, this is called relative efficiency. In other wordsis a method based on linear programming to measure the relative efficiency of a multiple set of decision-making units, which are comparable to each other (units operating in a homogeneous manner), use the same inputs and produce the same outputs (with varying quantities, of course).

these units can be banks, government agencies, hospitals, colleges, etc.The analysis of the data envelope is an effective method of Operations Research, which is used in measuring the relative efficiency of a group of units that produce identical outputs and use identical inputs as well, and it is difficult to quantify them explicitly, where according to this technique each unit is measured independently and compared given the total performance of all units, and, Therefore, it is classified as the best benchmark comparison method due to the excellence it shows by identifying the best equivalent or equivalent units relative to inefficient units by relying on multiple inputs and outputs, in addition, it does not require any information regarding input or output prices, nor does it require that the output be specific (output function). therefore, based on the comparison, this method can identify the main causes of weak and low efficiency of inefficient units, depending on the computational average performance of those units.[13] [9]

3.3.1.Application requirements of data envelope analysis technique

There are several requirements and conditions for applying the method of data envelopment analysis therefore:

1. The units involved in the evaluation must be homogeneous, that is, operate in the same environment and conditions as well as conduct the same business.
2. - Input and output data need to be very accurate, because the model is very sensitive to error, especially if there are extreme points in the data.
3. - The number of economic units included in the evaluation must be at least three times the total input and output, which makes the model as sober as necessary to measure efficiency.
4. - The need to have a direct correlation between inputs and outputs, i.e. the increase of inputs must contribute to the increase in outputs and vice versa, i.e. the need to have a correlation between inputs and outputs.
5. - Inputs and outputs should be positive variables and not negative variables.[7]

3.3.2.Importance of data envelope analysis technique

Lies the great importance in the use of data envelopment analysis: an in evaluating the performance of banks, as it facilitates the process of comparison between the efficiency of a large sample of them, and provide a set of criteria to determine the efficiency of each bank consists of its comparative advantage by comparison with the analysis of financial ratios accounting Mini which will be of use to the wider which provide independent judgment on the efficiency of banks, where they are taking into account multiple Range and variety of women at once, and then merges them all in scale efficiency. In addition to the above, the method of data envelope analysis is not a method that evaluates performance on the basis of mathematical planning, and the goal of its existence is to expand the role of mathematical techniques from planning to measurement and control, and be important in determining the result of a single efficiency in a multi-input and output operating environment where On the other hand he see that the method (DEA) has a great role and helps in determining the reference comparison, i.e. it identifies units that have the same goals and priorities but achieve the best and efficient performance, and on this basis each unit is classified according to the best levels of performance and then compared with other units.[5]

3.3.3.Data envelope analysis technique models

The models of the data envelope analysis method, which represent the indicators by which efficiency is measured, are the following:

1. Constant Returns to Scale:This model has been developed by researchers Charnes, Cooper, it is worth mentioning that the method of analysis of the data envelope, which is based on the principle that "any change in the amount of inputs used by inefficient units has a constant effect on the amount of outputs (services provided)" and that this property is known as the yield stability (CRS) and this property is suitable and appropriate only when all units stability characteristic of volume return on output, that is, any change in the amount of input that The data envelope analysis model (CCR), which includes models based on the orientation of decision-making units required to measure their productivity efficiency, is that if these units have an input orientation, i.e., whose goal is to use the least amount of inputs to provide a specific amount of outputs, it uses the model (CCR-I) to obtain efficient units, but if the units in order to obtain efficient units**.**
2. Variable Returns to Scale: This model was developed by Banker, Charnes, & Cooper: 1984, and the difference of this model from the model of fixed volume returns (CCR) is in terms of taking volume yields into account, as it distinguishes between two types of efficiency (technical efficiency and volumetric efficiency).[1] [14].
3. Macro Model:That this model is combined with the characteristics of the input orientation model and the output orientation model.

4. Data Analysis and Interpretation

Table.2. Results of measuring the efficiency of Al Mansour bank's strategic performance Financial perspective indicators for the period (2015-2019)

Indicators	(2015)	(2016)	(2017)	(2018)	(2019)
Return on assets	0.017	0.012	0.010	0.012	0.005
Return on deposits	0.024	0.017	0.013	0.015	0.006
Return on Title	0.063	0.045	0.046	0.064	0.026
Ratio trading	0.347	0.832	0.704	0.997	2.249
Legal reserve ratio	0.419	1.152	0.847	0.986	1.038

Table.3. Results of measuring the efficiency of commercial Gulf Bank's strategic performanceFinancial perspective indicators for the period (2015-2019)

Indicators	(2015)	(2016)	(2017)	(2018)	(2019)
Return on assets	0.012	0.007	0.007	0.001	0.007
Return on deposits	0.025	0.014	0.015	0.025	0.019
Return on Title	0.029	0.018	0.013	0.018	0.012
Ratio trading	7.601	2.386	5.384	1.954	1.135
Legal reserve ratio	0.541	0.386	0.759	0.833	1.113

Interpretation of table-2-3.

The above table shows us the results of the indicators of the bank sample research for the period of time (2015-2019) where the return on assets was extracted for each year, which represents the amount and is expressed in percentage , and that the bank gets it from investing in assets, i.e. it measures the returns generated from the assets, in addition to the , This ratio reflects the return that shareholders get from investing their money in the bank , and it is considered one of the most important profitability ratios used, since based on this ratio shareholders may decide to continue the activity or transfer funds to other investments that achieve a better return . Finally, the legal reserve ratio was extracted, representing the percentage of deposits with banks that the bank is obliged to keep by the central bank to cope with the withdrawals of customers, and takes the form of accounts with the central bank, and the bank does not receive interest for these legal reserves.

Table.4. Results of measuring the efficiency of Al Mansour bank's strategic performanceInternal operations perspective indicators for the period (2015-2019)

Indicators	(2015)	(2016)	(2017)	(2018)	(2019)
Overall productivity	1.493	1.647	1.611	2.089	0.929
Resource utilization rate	0.373	0.364	0.309	0.269	0.289
Revenue /	0.0	0.0	0.0	0.1	0.3

investments	59	65	84	92	16
Deposit investment rate	0.841	0.490	0.314	0.123	0.049

Table.5 Results of measuring the efficiency of commercial Gulf Bank's strategic performanceInternal operations perspective indicators for the period (2015-2019)

Indicators	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**
Overall productivity	0.379	0.307	0.202	0.377	0.265
Resource utilization rate	0.781	0.755	0.870	0.840	0.822
Revenue / investments	0.207	0.569	0.517	0.331	0.241
Deposit investment rate	0.181	0.192	0.189	0.216	0.225

Interpretation of table-4-5.
The above table shows us the results of the indicators of the bank sample research for the period of time (2019-2015), and the total productivity, which expresses the productivity of the elements of production, which is used in banking operations, which is the ratio of the product to its elements, which are quantifiable, and the rate of recruitment of resources, because some , The latter means the extent of the management's success in operating the bank's deposits in the operating areas that generate profits (loans and investments), and showed the ratio of revenues to investments, which refers to the percentage of revenues that the bank can obtain from various investments in its funds, and finally the investment rate of deposits was extracted and this percentage indicates the amount.

Table.6. Results of measuring the efficiency of Al Mansour bank's strategic performanceCustomer perspective indicators for the period (2015-2019)

Indicators	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**
Growth in deposits	0.334	0.062	0.252	0.268	(0.087)
Growth with cash credit	0.095	0.016	0.019	0.061	0.152
Growth with letters of guarantee	(0.184)	(0.338)	(0.132)	(0.405)	1.381
Growth in documentary credits	0.309	)(0.177	(0.189)	(0.404)	0.603

Table.7. Results of measuring the efficiency of commercial Gulf Bank's strategic performanceCustomer perspective indicators for the period (2015-2019)

Indicators	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**
Growth in deposits	(0.108)	0.154	(0.437)	(0.124)	(0.135)

Growth with cash credit	0.079	(0.131)	(0.289)	(0.160)	(0.157)
Growth with letters of guarantee	(0.132)	(0.388)	(0.678)	(0.315)	(0.142)
Growth in documentary credits	(0.453)	1.376	(0.891)	(0.095)	(0.475)

Interpretation of table-6-7.

The above table shows us the results of the indicators of the bank sample research for the period of time (2019-2015), starting with the deposit, where the deposit represents an agreement whereby the Depositor pays a sum of money by a means of payment, under which the bank is obliged to refund this amount to the Depositor on request or when it, which is divided into (1) current deposits (2) savings deposits (3) term deposits. He also explained the growth in cash credit, which represents the services provided to customers by which individuals and projects are provided with the necessary funds, provided that the debtor undertakes to pay those funds, interest and commissions due thereto, and includes cash credit (loans, advances, discounted and sold commercial papers).The growth was then indicated in the letters of guarantee, which are a written pledge issued by the bank at the request of the customer, by which the bank guarantees the customer or any other party the direction of the beneficiary of the letter of guarantee within a certain amount stated in the letter of guarantee in return for a certain service provided by the beneficiary to the Finally, the growth was extracted by documentary credits is one of the financial means used in banks, which is a paper issued by the bank at the request of the customer, in which he undertakes to pay a sum of money to another person within a certain period of time, in exchange for receiving a service or commodity, and the bank is obliged to pay by cash, or checks.

Table.8.Results of measuring the efficiency of Al Mansour bank's strategic performance Learning and growth perspective indicators (2015-2019)

Indicators	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**
Employee productivity	72,119.04	53,519.64	54,939.97	78,064.46	22,995.16
Growth in numbers of workers	0.078	(0.032)	0.004	0.004	0.328
Growing by branches	0	0	0	0	0

Table.9.Results of measuring the efficiency of commercial Gulf Bank's strategic performance Learning and growth perspective indicators (2015-2019)

Indicators	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**
Employee productivity	24,727.27	14,976.43	14,242.78	16,812.20	13,017.74
Growth in numbers of workers	0.203	0.032	(0.242)	0.185	(0.142)
Growing by branches	0	0	(0.2)	0	(0.05)

Interpretation of table-8-9.

The above table shows the calculation of employee productivity as well as growth in the number of employees as well as growth in the number of branches of the bank.The tables above show us the results of the indicators for the research sample bank for the duration of time (2015-2019), As to the productivity of the employees reflect the final outcome of the situation, psychological, moral, abilities and skills that are enjoyed for innovation, creativity, and the impact on the improvement of internal processes in the plant and the productivity associated with the employee on the quality of service provided by that express the quality of his. Through the growth in the number of employees, he explained the extent to which the bank attracted new skills and its ability to retain existing

employees.Finally, he pointed out the extent of the expansion and development of the bank in terms of the geographical area in which it provides its services.

Through the results of the Balanced Scorecard application is now encapsulated by the method of data envelope analysis and the following table shows this :

Table.10. Relative efficiency of Mansour Bank and Commercial Bank's and average years

Data	Mansour Bank	Commercial Bank's
Data 2015	0.820875	0.866154
Data 2016	0.765733	0.754286
Data 2017	0.831125	0.937692
Data 2018	1	0.807576
Data 2019	0.945833	0.920262
Dataaverage	0.80497	0.729091

Interpretation of table-10.

Based on the results of the above table for the period from (2019-2015) we can make a reference comparison between those banks during the study period and indicate which one was more efficient and distinguished from the other and which one was less efficient, In (2015) it is shown that the relative performance efficiency of Gulf Bank was higher than the relative efficiency of al-Mansur bank, reaching (0.866154), while the relative efficiency of Gulf Bank decreased in (2016) to overcome Al-Mansur bank with a relative efficiency rate of (0.765733), but in (2017) Gulf Bank returned to be the highest relative efficiency rate of(0.937692), to jump al-Mansur Bank (1), to decrease then in the following year (2018) but remained leading on the Gulf Bank with a relative efficiency rate of (0.945833) as well as in the last year (2019) has seen a decrease but also remained leading on Gulf Bank with a relative efficiency rate of (0.80497).

5.Summary

The researcher tried to demonstrate the reality of the Iraqi private banks research sample (Al Mansour Investment Bank, Commercial Gulf Bank) and through the analytical study conducted, the data was analyzed and applied balanced scorecard through its four basic perspectives (financial perspective, internal operations perspective, customer perspective and learning and growth perspective) and based on the results of the indicators of each of these perspectives, the results were reference comparison between those banks and during the study period Determine which banks were the highest efficient, and which ones were the lowest.

6.Recommendations

1. Due to the changes and developments in the contemporary business environment, economic units, in particular banks, have had to move out of the narrow scope and expand the use of modern methods, providing the necessary fundamentals for their application, providing the objective basis for measuring efficiency of performance and the emergence of optimal performance.
2. Banks should pay more attention to the modern strategic methods, especially in the case of integration among them, namely (Balanced Scorecard, data envelope analysis, and reference comparison) because they are among the most important methods that can be adopted in measuring performance efficiency, and as the key to the success of the economic unit and its continuation in the business environment.
3. Reject the nothingness hypothesis, which states that there is no moral effect of using the balanced scorecard, with its basic perspectives, in measuring the performance efficiency of Iraqi private banks during the duration of the research.

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