REVIEW OF INTERNATIONAL GEOGRAPHICAL EDUCATION
ISSN: 2146-0353 • © RIGEO • 11(3), SUMMER, 2021
www.rigeo.org
Research Article

Measuring The Efficiency of The Departments of The College of Administration and Economics / University of Baghdad Using the Method of Data Envelopment Analysis (DEA), A Comparative Study

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Abstract
The research aims at the possibility of measuring the technical and scale efficiency (SE) of the departments of the College of Administration and Economics at the University of Baghdad for a period lasting 8 years, from the academic year 2013-2014 to 2018-2019 using the method of Applied Data Analysis with an input and output orientation to maintain the distinguished competitive position and try to identify weaknesses in performance and address them. Nevertheless, the research problem lies in diagnosing the most acceptable specializations in the labor market and determining the reasons for students 'reluctance to enter some departments. Furthermore, the (Win4DEAp) program was used to measure technical and scale efficiency (SE) and rely on the data available in the student registration department. As the study included the seven scientific departments in the College of Administration And the economy. However, the results showed that the business administration, finance, and banking departments are distinguished by being the enveloped departments because they operate according to their full efficiency and maintain their peers during the period.

Keywords
Data Envelopment Analysis (EDA), Efficiency, Orientation Towards Inputs, Orientation Towards Outputs.

To cite this article: Albayatey, A, S, W.; Mawlood, S, J.; and Makttoof, H, S. (2021) Measuring the Efficiency of The Departments of The College of Administration and Economics / University of Baghdad Using the Method of Data Envelopment Analysis (DEA), A Comparative Study. *Review of International Geographical Education (RIGEO), 11(3), 1140-1151. Doi: 10.33403/rigeo. 800556*
Submitted: 20-01-2021 • **Revised:** 15-02-2021 • **Accepted:** 25-03-2021

Introduction

The interest of organizations today is focused on creating a distinguished generation of knowledge capable of generating distinct ideas capable of using brainstorming to find distinct solutions and exploiting opportunities and strengths of organizations by raising the quality of the outputs of the educational organization, which in turn is keen to provide the best educational service and practical experience for them. Nevertheless, the satisfaction achieved resulting from an intangible product, so the organizations, including educational ones, seek to raise the quality of their outputs by optimally exploiting their resources using the non-parametric mathematical method DEA, and measuring efficiency in service organizations is difficult due to the difficulty in determining the monetary value of their inputs and outputs, so the goal of the research is not to define decision-making units Enclosed by units that are more efficient than them in light of the same conditions surrounding all decision-making units, but rather to identify the causes of lagging and the ways in which departments (decision-making units) reach to achieve full efficiency.

Theoretical background

The Concept of Data Envelopment Analysis (DEA)

Data Envelopment Analysis (DEA) is one of the nonparametric mathematical operations research methods or techniques used for linear programming to measure performance efficiency and reference comparison between units (Abdullah & Ali, 2019). As a DEA methodology was proposed by Charnes, Cooper, & Rhodes based on concepts presented by Farrell 1957, and this technique uses linear programming to compare and evaluate the performance of decision-making units (DMUs) to determine the best (Bangi, 2014) in organizations with different outputs and inputs using mathematics (Borge, 2000). As it is a quantitative method for analyzing and evaluating the performance of organizations to raise the efficiency of the lagging units (Borge & Naper, 2006). and the efficiency ratio ranges between 100% - that is, the one which is an integer number, meaning that the decision-making unit is very efficient and it is located on the efficiency curve and 0 %, Meaning inefficiency is located below the efficiency approach, as the efficient units are higher than or encircled by them, hence the name, and on the basis of the efficient units that represent a reference, the performance of the lagging units is compared with them in order to try to motivate them to be efficient in the future (Bradley et al., 2001). Furthermore, to use DEA technology to evaluate the performance of DUMs, several basic parameters must be fulfilled (Chaloob et al., 2014) that the input used and the output obtained for decision-making units (DUMs) must be similar to the possibility of comparison between them and have the opportunity and the same access to the available resources, as the decision-making units DUMs We have it can be represented by the seven scientific divisions, in addition to that the applied analysis of the data DEA accepts all values in the case of variable returns to scale, even if they are negatives or zeros, and rejects them otherwise as it either adds a constant or minimizes it until it is neglected and does not interfere For comparison (Conroy & Arguea, 2008) and that the number of decision-making units within the sample is greater or equal to three times the number of inputs and outputs combined (Cooper et al., 2000).

Efficiency And Its Types

The date of measuring the efficiency of business performance is (Drebee et al., 2018), when measuring the efficiency of production units experimentally (Elını et al., 2014). However, efficiency is defined as the comparison between the outputs achieved and the inputs of the decision-making unit (Fried et al., 2008): the higher the efficiency of the DMUs, the more the DMUs can (float) encircle or encapsulate the departments or other bodies that have taken the less efficient decision (Li & Yang, 2014). Efficiency means the possibility of determining the levels of the organization's performance for its work, correcting it and improving it, and identifying its deficiencies in order to overcome it in the future for achievement Decision-making units for their better work (Lotfi et al., 2020) to achieve the largest amount of outputs (Mat et al., 2013), i.e. the ability of the decision-making unit to achieve its goals in improving its performance and increasing its outputs with the least possible input, so any decision-making unit is ineffective if another unit is able to achieve the same outputs with the least amount of the first unit's inputs (Olariu & Brad,

2017). From the above, it can be defined as the ability to achieve the best in a distinctive manner with the least possible resources of the highest possible quality, and the efficiency includes two aspects (the input and outputs) as follows: (Paradi et al., 2017; Sa'il Abd et al., 2020; Sathye, 2003).

Input Aspect

It is through the ability of the organization to stabilize the size of its outputs with the possibility of reducing its inputs, meaning, in other words, the possibility of fixing the size of the achieved outputs themselves with the possibility of compressing the inputs such as eliminating waste and reducing damage and others or using as little as possible of the organization's resources, and the organization is able to distinguish between two types of efficiency and represented with scale efficiency (SE) and technical efficiency, by applying the (Banker and Charener and Cooper) model which known as (BCC), and the (Variable Returns to Scale) model which known as (VRS), variable returns to scale when organizations do not operate at their optimal size level, it is assumed that not all large-scale producers work with the same idealism, meaning that the output ratio may fluctuate up or down or equivalent to the same ratio when the inputs of decision-making units (DMUs) increase, in other words they can work according to increasing or decreasing yields of volume, as well as the CCR model developed for the original form. It is worth noting that the decision-making units that are ideal according to the (BCC) model are also ideal according to the (CCR) model, but the opposite is not always true for the possibility of achieving a fixed return on the efficiency limit in the first case, and by using linear programming, two models (BCC - I) are applied and (CCR - I) derived from the original model of constant volume yield level (BCC-O and CCR-O) as follows:

$$CCR-I\begin{cases} Min_{o,\lambda} O \\ S.T\begin{cases} Ox_o - x\lambda \geq 0 \\ y\lambda \geq y_0 \\ \lambda \geq 0 \end{cases} \end{cases}$$

The Binary Issue of the BCC-I Model Is Represented by This:

$$CCR-I \quad S.T\begin{cases} Min_{os.\lambda} O_s \\ O_B X_o - X\lambda \geq 0 \\ y\lambda \geq 0 \\ e\lambda = 1 \\ \lambda \geq 0 \end{cases}$$

The Output Aspect

This aspect lies in the ability of organizations or decision-making units (DMUs) to increase the proportion of their outputs and inputs directly and in the same proportion and seek to achieve their goal in the possibility of increasing their outputs while stabilizing their inputs, i.e. without increasing their inputs, and is used when all decision-making units work with their optimal size level, which is a difficult case in conjunction with the impact of the external environment and competition on those units, In this case, we use the Constant Return to Scale model which is known as (CRS) that developed by Charnes and Cooper and Rhodes called the fractional model.
and the most prominent characteristic of the constant volume returns model is the ideal conditions as well as the fact that it does not distinguish between technical and scale efficiency (SE) when the organization is not operating at its ideal size (C. Paradi & etal, 2018: 10). The well-known (Banker and Charener and Cooper) model (BCC) can also be used. And it differs from (CCR) in that its output gives us the degree of relative efficiency, while (BCC) gives the degree of technical and scale efficiency (SE) and this can be represented by linear programming CCR- O and BCC- O as follows:

$$CCR-O\begin{cases} Max_{u.o} = \dfrac{\sum_{r=1}^{s} u_r y_{rj}}{\sum_{t=1}^{m} o_i x_{ij}} \\ S.T \quad \dfrac{\sum_{r=1}^{t} u_r y_{rj}}{\sum_{i=1}^{m} o_i x_{ij}} \leq 1 \\ O_1, O_2, \ldots . O_m \geq 0 \\ U_1, U_2, \ldots . U_S \geq 0 \end{cases}$$

Since O is the degree of efficiency represented by equation 1, r is the number of outputs and takes

values (r = 1, 2, 3…. s) and i represents the number of inputs and takes the values (I = 1,2, 3… .m), and Yrj represents a quantity the output r is for the j unit and Ur represents the output weights r while Yij represents the input quantity i for the j unit and Ui represents the input weights i and for it the linear programming of the (CCR -O) model:

$$CCR-O\begin{cases} Max_{uo} = UY_J \\ OX_J = 1 \\ S.T\begin{cases} -OX + UY \le 0 \\ 0 \ge O.U \ge 0 \end{cases} \end{cases}$$

As for the BCC-O form, it is as follows:

$$BCC-O\begin{cases} Max_{u.o} = \dfrac{Uy_O - U_O}{Ox_O} \\ S.T\begin{cases} \dfrac{Uy_J - U_O}{Ox_O} \le 1, J = 1,2,\dots.n \end{cases} \end{cases}$$

Linear Program BCC – O

$$BCC-O\begin{cases} Max_{uo}Z = Uy_o - U_o \\ O_{xo} = 1 \\ S.T\begin{cases} -O_x + U_y - U_0 \le 0 \\ 0 \ge O, U \ge O, U_O \ge 0 \end{cases} \end{cases}$$

However, the efficiency includes several types: (Tsakiridou & Stergiou, 2014).

Economic Efficiency:

It means the optimization of using the resources of the organization (the decision-making unit) to obtain the largest possible return, and it is defined from the perspective of the input as the ability of the decision unit to reduce the inputs to reach the specified outputs and it is defined from the perspective of the outputs as those units that are able to optimize the use of their inputs to increase the number of their outputs.

- Relative efficiency represents the ratio of total output to the input used.
- Technical efficiency represents the ability of the organization to achieve the largest return or amount of output using available inputs and it is also called technical efficiency.
- Scale efficiency (SE) used to measure the fitness of decision-making units.
- Specialized or distributive and employment competence: It represents the ideal of obtaining distinguished outputs using the optimal use of resources and the lowest possible cost.

Cost Efficiency:

The percentage resulting from the costs actually used to produce the output is at the lowest cost without affecting the quality of the product or harming it relative to the amount actually allocated to it.

Educational Competency:

Optimization of the use of the organization's resources represented by the requirements of the educational process to achieve the largest possible output of that process and include internal efficiency (input) and is intended to achieve the objectives of the educational system through the relationship between inputs and outputs through the students' crossing to other stages, In turn, it includes the quantitative competence and is represented by the ability of the student graduation system according to the time limit specified for each academic stage. Furthermore, qualitative competence is represented by knowledge, education, and skills acquired after leaving the educational system. As for the external efficiency (outputs), it is represented in the possibility of matching the needs of the labor market from the outputs of the educational process, including those who have the skill and experience, and include the external scale efficiency (SE) and are represented by the educational system outputs that meet the actual needs of the labor market.

Methodology

The Research Problem

The problem of the quality of educational outcomes is a concern of many educational organizations in light of the competition to gain consumer satisfaction, represented by a market opportunity for success and growth in light of the equivalent conditions surrounding decision-making units, by diagnosing the most acceptable specializations in the labor market and determining the reasons for students 'reluctance to enter some Departments and their preference to join others.

Research Objective:

Education institutions form the nucleus of society and the secret of the success and development of nations. Therefore, the research aims to diagnose the level of efficiency of the departments of the College of Administration and Economics and to identify the superior departments using the method of data envelopment analysis and comparison between results.

The Importance of Research:

The research deals with an important topic and a necessary requirement that lies in measuring efficiency in the method of enclosing data. The research is applied in the scientific departments of the College of Administration and Economics, which became the subject of measurement and evaluation of the requirements for achieving quality. the research is considered as a modest addition to benefiting departments, managers, and employees.

Spatial And Temporal Limits of Research

Spatial Limits of Research:

The research included measuring the efficiency of the performance of the departments of the College of Administration and Economics, University of Baghdad with its seven scientific departments (accounting, business administration, statistics, industrial administration, public administration, economics, finance and banking).

Temporal Limits of Research:

The research continued for a period of 8 years from 2013 to 2019 for two consecutive years because the educational system necessitates four years of study for the graduate to obtain a bachelor's degree in one of the above-mentioned specializations, so the system's inputs are in the first academic year 2013-2014 and its outputs in the year 2017-2018 and the second academic year is from 2014-2015 until 2018-2019, and because the Finance and Banking Department does not own postgraduate studies, the data for all sections have been omitted because they affect the mechanism of the EDA method in that the inputs = outputs.

Win4DEAp:

Win4DEAp program is used to measure technical and scale efficiency (SE). Previously, DEAP was used to enter input and output values using Excel, DOS, and TEXT files, and after 2015 it was developed by Tim Coelli, and the windows system was used, so it became easier and faster. (Tung et al., 2018) was used to show results.

Results

Historical Overview

The College of Administration and Economics, University of Baghdad was established in the mid-third decade of the last century, with the establishment of the Institute of Financial Sciences in

1936, which was entitled to the College of Law in the late sixth decade, specifically in 1968, and the Colleges of Commerce and Political Science and the College of Business and Public Administration were merged together to become one college that includes many specializations. Nevertheless, it was named in 1969 as the College of Administration and Economics, which was studied at first for a period of five years, then became four years of study in 1975 and up to now, and it currently includes seven departments: (Accounting, Business Administration, Finance and Banking, Public Administration, and Industrial Management, Statistics, economics).

Statistical Analysis:

In order to estimate the technical and scale efficiency (SE) of the previous seven departments according to the returns of the variable size, where the inputs and outputs must be carefully determined, as the inputs were determined by preparing the accepted students and preparing the teaching staff and the outputs represented by preparing the graduates for the seven departments of the college, as it is known that the study period is four years, so the study will be included preparing students accepted for the academic year 2013/2014 and 2014/2015 and graduates in 2017/2018 and 2018/2019. Furthermore, two consecutive years for the inputs were selected and measured on the basis of the extent to which the departments maintained their efficiency during the study period, which amounted to four years for the initial study. Nevertheless, postgraduate studies were not added due to the fact that the Finance and Banking Department does not have postgraduate studies and therefore data cannot be added due to the inability to fulfill the DEA requirement. "The number of decision-making units within the sample is greater or equal to three times the number of inputs and outputs combined" (Visbal-Cadavid et al., 2017; Wezel, 2010; Zhu, 2014). Table No. (1) shows the inputs and outputs of the seven scientific departments in the College of Administration and Economics, University of Baghdad.

Table (1).
Input and output of the method of data envelopment analysis

The sequence	Scientific department	Scientific department code	The period from 2013-2014 to 2017-2018		
			The input		Outputs
			Accepted students	Number of teachers	Graduate students
1	Business Administration	DMU1	223	31	*240
2	Industrial management	DMU2	141	28	99
3	Statistics	DMU3	192	39	67
4	Accounting	DMU4	286	32	267
5	Public Administration	DMU5	311	28	259
6	Economy	DMU6	319	42	296
7	Finance and banking	DMU7	200	11	179

The difference between accepted and graduate students (* 240) As 17 students from the business administration departments in private colleges were accepted from among the first students, as they were added in the second academic year

Number of DMU ≥ 2 (Input + Output)
7 ≥ 2(2+1)
7 ≥2(3)
7 ≥ 6
Therefore, the sample is applicable according to the conditions of the data envelopment analysis method

Table (2).
The Input and Output of The Data Envelopment Analysis Method

The sequence	Scientific department	Scientific department code	The period from 2014-2015 to 2018-2019		
			The input		Outputs
			Accepted students	Number of teachers	Graduate students
1	Business Administration	DMU1	197	31	184
2	Industrial management	DMU2	179	28	84
3	Statistics	DMU3	95	39	60
4	Accounting	DMU4	379	32	191
5	Public Administration	DMU5	413	28	247
6	Economy	DMU6	392	42	229
7	Finance and banking	DMU7	150	12	102

Number of DMU ≥ 2 (Input + Output)

7 ≥ 2(2+1)

7 ≥2(3)

7 ≥ 6

Therefore, the sample is applicable according to the conditions of the data envelopment analysis method

Measuring The Efficiency of The Scientific Departments of The College of Business and Economics and Evaluating It According to The Input-Oriented Variable Volume Returns Model (VRS- IO):

When measuring the efficiency of the technical and scale performance directed towards the inputs for the period (2013 / 2014-2017 / 2018), we find that there are two decision-making units (DMU1 and DMU7) or two scientific units (Business Administration, Finance and Banking) that work according to their full competencies to achieve an efficiency degree equivalent to (1) Integer. As for (DMU2, DMU3, DMU4, DMU5, and DMU6), they were the least efficient, as DMU4 was the best and DMU3 was the worst, reflecting the weakness of its technical flexibility, and on the contrary, we note the flexibility of the variable volume returns model VRS) as DMU3 for the period (2013/2014 - 2017/2018) was the only one that is not Efficient compared to CRS. See Table (3).

Table (3).
The Value of Technical and Scale Efficiency (SE) According to (VRS-IO) Model for The Period 2013-2014 To 2017-2018

The sequence	DMU	Technical efficiency CRS	Competency assessment	Technical Efficiency VRS-IO	Competency assessment	Scale Efficiency	Competency assessment	Volume Returns RTS
1	DMU1	1	Efficient	1	Efficient	1	Efficient	CRS
2	DMU2	0.6	Inefficient	1	Efficient	0.6	Inefficient	IRS
3	DMU3	0.3	Inefficient	0.73	Inefficient	0.4	Inefficient	IRS
4	DMU4	0.88	Inefficient	1	Efficient	0.88	Inefficient	DRS
5	DMU5	0.83	Inefficient	1	Efficient	0.83	Inefficient	DRS
6	DMU6	0.83	Inefficient	1	Efficient	0.83	Inefficient	DRS
7	DMU7	1	Efficient	1	Efficient	1	Efficient	CRS

The average technical efficiency can be calculated according to the variable volume returns model for the period 2013-2014 to 2017-2018 = (0.77). As for the scale efficiency (ES), we note that the decision-making units (DMU2, DMU3, DMU4, and DMU6) do not operate according to the increasing returns to scale (IRS) As for the rest (DMU1, DMU5, and DMU7), they work with their full efficiency and the average scale efficiency (ES) = (0.79). As for the period from 2014-2015 to 2018-2019, it was (0.88), see table (4):

Table (4).
The Value of Technical and Scale Efficiency According to (VRS-IO) Model for The Period 2014-2015 To 2018-2019

The sequence	DMU	Technical efficiency CRS	Competency assessment	Technical Efficiency VRS-IO	Competency assessment	Scale Efficiency	Competency assessment	Volume Returns RTS
1	DMU1	1	Efficient	1	Efficient	1	Efficient	CRS
2	DMU2	0.5	Inefficient	0.73	Inefficient	0.68	Inefficient	IRS
3	DMU3	0.67	Inefficient	1	Efficient	0.67	Inefficient	IRS
4	DMU4	0.72	Inefficient	0.75	Inefficient	0.95	Inefficient	DRS
5	DMU5	1	Efficient	1	Efficient	1	Efficient	CRS
6	DMU6	0.76	Inefficient	0.89	Inefficient	0.84	Inefficient	DRS
7	DMU7	1	Efficient	1	Efficient	1	Efficient	CRS

Likewise, for the period from (2014-2015 to 2018-2019), we note that the decision-making units (DMU1 and DMU7) or the two departments (Business Administration, Finance and Banking) that remained fully maintained to achieve an efficiency degree equivalent to (1) integer, and DMU5 was added to them, while the lesser units Efficiency (DMU2, DMU3, DMU4, and DMU6) was the least efficient, as DMU4 was the worst and DMU6 was the best, as it needed (70%) to raise its performance efficiency. However, this is not sufficient to identify only the poorly performing units in the educational institution as a weakness that must be addressed and that is by using the reduction rate, i.e. a reduction in the input ratios in light of the variable volume returns to reach the same outputs and it is called the correction ratio which it is based on the evaluation ratio of the weaker performance of the Decision-making units, meaning that this percentage, if added to any other section, contributes to making it efficient, see Table (5).

Table (5).
Evaluation Of Technical Efficiency According to the (VRS-IO) Model for The Period 2013-2014 To 2017-2018

The sequence	scientific department	Technical Proficiency VRS-IO	Reduction ratio of the input		The scientific department referred to
			Accepted students	Number of teachers	
1	DMU3	0.73	0.26	0.28	DMU2

The same applies to the period 2014-2015 to 2018-2019, see Table (6)

Table (6).
Evaluation Of Technical Efficiency According to the (VRS-IO) Model for The Period 2014-2015 To 2018-2019

The sequence	scientific department	Technical Proficiency VRS-IO	Correction ratio		The scientific department referred to
			Accepted students	Number of teachers	
1	DMU2	0.73	0.26	0.28	DMU 7&3
2	DMU4	0.75	0.24	0.25	DMU 5&1&7
3	DMU6	0.89	0.1	0.33	DMU 5&1

Measuring The Efficiency of The Scientific Departments of The College of Business and Economics and Evaluating Them According to The Output-Oriented Variable Volume Returns Model (VRS- OO)

When using the variable volume returns model directed towards the outputs, it appears that the number of departments or decision-making units for the period 2013-2014 to 2017-2018 were all efficient except for (DMU3) and we notice that the average degree of technical competency of the departments increased to (0.90), see Table No. (7). As for the scale efficiency (SE), we note that the average efficiency of the decision-making units was (0.867) and that the efficient units that operate with full efficiency are (DMU1 and DMU7) i.e. (Department of Business Administration, Finance and Banking), which reflects the fact that they are the encompassing departments of the other college departments.

Table (7).
The Value of Technical and Scale Efficiency According to (VRS-OO) Model for The Period 2013-2014 To 2017-2018

The sequence	DMU	Technical efficiency CRS	Competency assessment	Technical Efficiency VRS-IO	Competency assessment	Scale Efficiency	Competency assessment	Volume Returns RTS
1	DMU1	1	Efficient	1	Efficient	1	Efficient	CRS
2	DMU2	0.6	Inefficient	1	Efficient	0.6	Inefficient	IRS
3	DMU3	0.3	Inefficient	0.32	Inefficient	0.93	Inefficient	IRS
4	DMU4	0.88	Inefficient	1	Efficient	0.88	Inefficient	DRS
5	DMU5	0.83	Inefficient	1	Efficient	0.83	Inefficient	DRS
6	DMU6	0.83	Inefficient	1	Efficient	0.83	Inefficient	DRS
7	DMU7	1	Efficient	1	Efficient	1	Efficient	CRS

The departments maintained their efficiency for the second period extending from 2014-2015 to 2018-2019, as the percentage was (0.807) according to Table No. (8) and when calculating the scale efficiency (SE), we notice the transformation of the decision-making unit (DMU5) to become efficient as well, where the average scale efficiency from (0.867) to (0.90).

Table (8).
Technical And Scale Efficiency (SE) Value According to (VRS-OO) Model for The Period 2014-2015

The sequence	DMU	Technical efficiency CRS	Competency assessment	Technical Efficiency VRS-IO	Competency assessment	Scale Efficieny	Competency assessment	Volume Returns RTS
1	DMU1	1	Efficient	1	Efficient	1	Efficient	CRS
2	DMU2	0.5	Inefficient	0.53	Efficient	0.94	Inefficient	IRS
3	DMU3	0.67	Inefficient	1	Efficient	0.67	Inefficient	IRS
4	DMU4	0.72	Inefficient	0.8	Efficient	0.9	Inefficient	DRS
5	DMU5	1	Efficient	1	Efficient	1	Efficient	CRS
6	DMU6	0.76	Inefficient	0.95	Inefficient	0.79	Inefficient	DRS
7	DMU7	1	Efficient	1	Efficient	1	Efficient	CRS

Evaluating The Efficiency of The Departments of The College of Administration and Economics According to The Variable Volume Returns Model Directed Towards the Outputs/Graduate Students (VRS - OO)

The previous tables showed the percentage of technical and scale efficiency of the scientific departments or decision-making units that did not reach the required efficiency percentage, i.e. they were not working according to their full efficiency, and with the aim of reaching the required level of efficiency, they are treated according to the correction ratio, That is, the percentage increase in outputs in light of the variable volume returns to measure the ratios that must be obtained from the same inputs to reach the level of full efficiency according to Table No. (9) for the 2013-2014 academic year, in which it appears that the decision-making unit (DMU3) is the one with the lowest efficiency and the amount (0.32).

Table (9)
Evaluation Of Technical Efficiency According to the (VRS-OO) Model for The Period 2013-2014

The sequence	Scientific department	Technical ProficiencyVRS-OO	The rate of increase in output	The scientific department referred to
			Accepted students	
1	DMU3	0.32	0.67	DMU1&2

As for the academic year that follows 2014-2015, we note that there are three decision-making units that have not reached the level of complete performance, but the lowest percentage is taken to ensure the improvement of the performance of other departments in the event of adding a correction rate to it, see Table No. (10).

Table (10)
Technical Efficiency Evaluation According to the (VRS-OO) Model for The Period 2014-2015

The sequence	Scientific department	Technical Proficiency VRS-OO	Correction ratio Graduate students	The scientific department referred to
1	DMU2	0.53	0.86	DMU 1&3&7
2	DMU4	0.8	0.24	DMU 1&5
3	DMU6	0.95	0.04	DMU 1&5

Conclusions

Using the method of data envelopment analysis (DEA) to measure the efficiency of the scientific departments in the College of Administration and Economics is one of the good methods for identifying weaknesses in performance and trying to address them. The reason for the Department of Business Administration maintaining its efficiency throughout the selected period of time is due to the awareness of the educational staff to rely on their own efforts to raise the efficiency of the department and their efforts to publish in international academic journals to maintain the department's competitive position in accordance with national and international quality standards. Also, the same applies to the finance and banking department, which is modern, small, and desirable in the labor market. The results of the scale efficiency (SE) for the year 2013-2014 showed that the distinguished departments are the business administration, the finance and banking departments, as they operate according to their ideal size, in addition to adding the general administration department to them according to the model (VRS-IO and VRS-OO). This discrepancy between the enveloped departments and the other departments according to the effects of the external environment is due to the increase in the number of those wishing to join the department due to the large demand in the labor market for graduates of the the enveloped departments. Increasing the number of the proposed business administration department in private colleges, which increased the teaching staff's insistence on discrimination during the increase in their participation in conferences, seminars and workshops.

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