Designing a DEA Model to Evaluating Performance for Hierarchal Decision Making units with Weighting Attribute in hypermarket departments

Abstract

Evaluate and continuously improvement organizational performance, creates a great synergy force that this force can support the growth and develop plans, and create opportunities for organizational excellence. Performance evaluation with data envelopment analysis models is unappropriated approach for improving performance. Using classical DEA models have some limitations. In this study, we tried to be overcome some of these limitations. The aim of this study is to provide data envelopment analysis model for similar and Homogenous units that are in a hierarchical structure and different importance of evaluation indicators. For this purpose, the weighted hierarchical data envelopment analysis model formulated and then Accomplished to a case study and analyzed the results.

Key word: Performance evaluation, weighted hierarchical Data envelopment analysis, hierarchical DMUs, departments, hypermarket.

1- Introduction

In the current era, the dramatic changes in knowledge management, having evaluation system is inevitable, absence of an evaluation system in different aspects of an organization, including the assessment of using resources and facilities, staff, goals and strategies considered as one of the symptoms of the disease in that organization. Each organization has urgent need to evaluation in order to be aware of the desirability and quality of its activities, especially in complex and dynamic environments. Also, an assessment in units and inside levels of organization in order to decide whether to invest or not invest in particular sectors and areas is necessary. In large organizations, such as large stores, because of the their processes width and the complexity of the supply and sale process, intra-organizational controls are particular importance to the organization, since a large amount of necessary information for management decisions through measurement and evaluation of performance system in different parts is provided.

One of the evaluating unit performance methods is data envelopment analysis, that is a multi-criteria approach for decision making and unit performance evaluation. In this method, it is possible to calculate the efficiency of units by using several input and output variables and separate efficient units from inefficient units. The performance of this method is subject to conditions. These conditions in classical models include the homogeneity of units in terms of evaluation indicators, the logical proportion between the number of units and the number of inputs and outputs, the importance of the units being evaluated and the uniqueness of the units being evaluated.

In many organizations, the units have a hierarchical structure, can mention structures such as universities organizational structures from the colleges department, banks from branch to district administration, medical universities of the t Therapists department to hospitals and large supermarkets from departments to sections, where the indicators for assessing different levels can vary from one another. What is important in assessing the units of such organizations at different levels is three main points: First, the relationship between the various units being evaluated can be effective in evaluating them; second sub-units of each section can have different evaluation indicators with other parts and it creates these heterogeneous forms at lower levels, and third, usually the number of evaluated units in high levels and also sub-units of each upper is limited and creates these problems to differentiate the performance of these units. Accordingly, the purpose of this study is to provide a data envelopment analysis model based on CCR 2 model or CCR for hierarchical units in order to first using of relationship between different levels in organization's hierarchy in their performance evaluation, Second, by using them and presenting a new method, make a best differentiate of different levels of limit units and overcome the forms such as the Anderson-Peterson method, which makes it impossible to compare the …….. units with the……, third , overcome On the weakness of previous hierarchical models, the inability of some of the answers to be presented with two innovative methods Fourth, present improvements in the calculation of the final score of the lower-level units performance, high up the complete ranking of higher-level units and ultimately by defining the confidence region for the model's responses provide possibility to weigh the indicators.

2-Theoretical fundamental and research back ground

2-1- Data coal analysis technique

Data Envelopment Analysis is a mathematical programming technique that measures the group approximate efficiency of decision-making units. In other words, data envelopment analysis is a method for measuring the approximate performance of organizational units that has different inputs and outputs, and it is difficult to compare and measure its performance (Fortunatusian, 1994). In 1957, Farrell measured the efficiency of the production unit by using a method like measuring efficiency in engineering topics. The case that Farrell considered to measure efficiency included an input and an output. Charles, Cooper and Rhodes developed Farrell's vision and presented a model that has the ability to measure efficiency with multiple inputs and outputs. This model was named "Data Envelopment Analysis" and for the first time was used in the Edward Rhodes`s PHD thesis and CoPer's guide and was used as a Academic Achievement of Students in US National Schools in 1976 (Mehregan 2004).

This method has been added to the literature of literature by integrating Farrell's method (1957) in such a way as to characterize the production process with several production factors (input) and several

products (out put) (Charens et al. 1978). Obtained efficiency in DEA method is approximate performance and the efficiency boundary is created by conveying a compound of efficient units. So any unit that is located on the above border is efficient and otherwise it will be inefficient. In order to operate a inefficient unit and should be made changes in the inputs and outputs of that unit. It is worth noting that after the DEA models implementation , a collection is represented as the reference set. In this series it is determined that each inefficient unit to achieve efficiency boundary must be compared with which efficient units (Charens et al., 1978).

Deploying and using Data Envelopment Analysis is very useful where the comparison is between decision-making units based on multiple inputs and outputs and possibly is done with different measurement tools . Also, where the exact nature of transformation relationships is unknown to the inventor or is not easily identifiable, an assessment based on this approach can be used to classify decision-making units according to the specific function of each unit, identify sample units for those units whose performance can be improved and determine target for poorly-performing decision-maker units, based on the performance of the sample units (Safari and Azar, 2004).

2-2- research back ground

Rafiee and Abbas Abadi (2011) in studding performance evaluation of chain stores with the data envelopment analysis method evaluated the Etka performance chain stores . The results of this research after implementation of the CCR inductive model and determining the efficiency score of each unit show that 68% of these stores are efficient and 32% of them are inefficient. Poor Kazemi and Najafi (2006) studied ranking Shahrvand chain stores with emphasis on education and creativity metrics by using the ideal solution. In this study, from 12 Shahrvand stores , eight stores have been selected and reviewed. The Azadegan store ranked first and the Baharan store ranked the last. Shayesteh (2010) in studding a new method for ranking decision-making units presented new methods for ranking decision-making units with the help of a common set of weights in Data Envelopment Analysis, which includes several simple methods for ranking of effective units. In the presented methods, some standard models weaknesses of data envelopment analysis have been resolved. Olfat et al. (2012) presented a model for evaluating supply chain performance by using a network data envelopment analysis model for evaluation of supply chain performance. In this study, the data network analysis model is used. The results of this research show that the four chains of 89 studied chains have one performance and the lowest observed performance is 0.43. Ghasemi and Jahangard (2011) in studding "Estimating the efficiency of Maskan Bank branches in equipping resources and allocating facilities: an approach to huge-efficiency model with weight limitations" by using a combination of data envelopment analysis method and analytic hierarchy analysis compute component efficiency Meskan Bank Branches in toolin resources and expenses. The results show that most branches have low technical efficiency in equipping resources and allocating facilities. Fazeli (2011) In studding "Measuring the productivity of Iran water industry with data envelopment analysis approach ", in order to considering the priorities and preferences of industry managers, were prepared paired questionnaires and distributed among the distribution experts and were introduced the results into the model as approximate weighted constraints. The results showed that the average efficiency in the first window is higher than the second window, which indicates the better performance industry in year 85 than in the year 87.

Uroumannatan (2008) in studding operational efficiency assess in UK retail sector, evaluates the performance of UK retailing companies in the. In this study three data-processing methods : Data

Envelopment Analysis(DEA), Malmquist Productivity Index (MPI) and Bootstrap Regression were used . The results showed that only 10 companies under the assumption of CRS and 16companies under the assumption VRS were efficient. Tomas, Bar, Kronoslkum (1998), in studding "A Process for assessing the Performance of a Chain Store: A Restricted DEA Approach" Study on Chain Stores. One of the goals of this assessment is the assessment of executives for upgrading in the future. This research shows that many factors, such as store location and human resource management, are related to efficiency and good management in stores. Barroughs and Alves (2003) In studding of "efficiency of the Portuguese hypermarket Chain Store", by using the data envelopment analysis method examined the performance of the unique chain stores affiliated with a Portuguese hypermarket,. The overall result of the research showed that most units are efficient. Castelli, Phenomenokovich (2004), in a study on "DEA-like models for evaluating the performance of units with hierarchical structure", sought to define a new model for hierarchical evaluation units. Each evaluated unit, is composed of successive fields under the parallel units. In both cases (one-level and two-level), this study has shown that the maximum approximate performance of an evaluated unit is determined by comparing with all available sub-units. Mohammad Dia and Fouadbn Abdul Aziz (2011) according to studding "A Hierarchical Method for Performance Evaluation based on Data Envelopment Analysis: Case Study of Companies Competition in Economics presented a new method for evaluating hierarchical performance ". The mention method is used to evaluate the performance of heterogeneous companies in the economy. This approach has made companies compare each other in one sector and also compare the segments in an economy.

In most articles, such as Rafiee and Abbas Abadi's (1390) book review of "Chain Store Performance Evaluation" and Thomas and Associates (1998), "A Process for Assessing the Performance of a Chain Store", Performance Evaluation at Branch Levels and has not paid attention to the organization's hierarchical structure. The present study carried out a performance evaluation for the internal units of a large store with a hierarchical structure. Also, in the study of Barrow and Alves (2003), entitled "Hypermarket chain stores performance in Portugal," the CCR model was used to evaluate the performance of the store, but in the under study store due to the two-levelness of the evaluators and different weights of the indicators, can`t use of this Simple model . On the other hand, the concept of hierarchy in the Castelli et al. study (2004), entitled "DEA-like quadratic models for the evaluation of the performance of units with hierarchical structure", is in the input and output indicators, so that each indicator is made from several subindicator, while in the forthcoming study the hierarchy finds value in the evaluated units, and in this respect has more similarity with the study of Di and Abdul Aziz (2011) entitled "A hierarchical approach to performance evaluation based on data envelopment analysis: Case study Competitiveness of Companies in the Economy ", which has been tried with two innovative ways overcome on defection of this research in irreversible of some evaluated units and also improvements will be made to calculate the efficiency of the units at different levels.

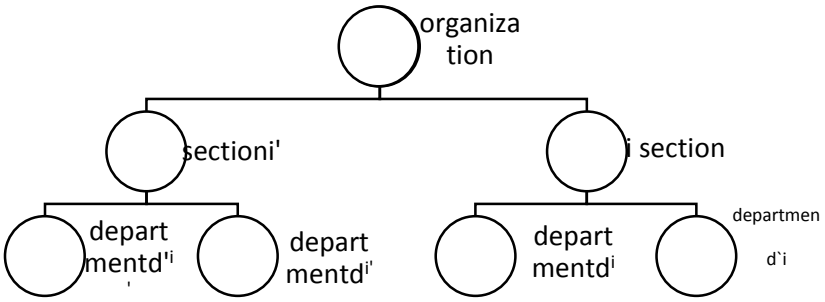
3-Research topics

The research study is on the Persoon hypermarket with seven sections and 49 departments. Inputs and outputs are the same for sections and departments, and for parts, amounts relate to space value inputs, employees' salaries and sectors capital involved , from total amounts of these indicators in the sub-section Departments of this section are obtained. Also, outputs such as turnover and gross profit are derived from total amounts of related to the outputs of the sub-collections and the values of the income growth index are derived from the mean of this indicator in its related departments. Is. In order

to survey the claims presented in the research, from breakdown comparability of obtained performance scores for sections and departments has been used at different stages of work.

The research model consists of combining two sub-models. The first sub-module is related to the evaluation of hierarchical units, which is adapted from the Dya and Abdul Aziz models(2011), that has phrases by researchers which solves some of the irreparable answers, and made improvements in different levels of calculating the units performance score and the second sub-model is related to weighting to indices, which is used by the trustful area method (Thompson et al., 1986). The executive stages of the research are composed of four stages: 1. Evaluation of the initial performance of the higher level units of the organization, which consists of four steps: 2. Evaluation of the initial performance of all lower level units, which also includes four executive steps It should be. 3. Combining the performance scores of the first and second stages and obtaining the final score efficiency of each lower lever unit. 4. Combining the performance scores of the first and second stages and obtaining the final score of the efficiency of each higher level unit. The structure of the evaluated units in this study is described in Figure 1.

Figure 1. evaluation hierarchical units structure



Introduction of indices, variables and decision parameters

i-Evaluated part

i-Other parts(i=1,…….,n)

d^i-Evaluated department related to part i

d^i-Other department related to part i(d^i=1….L^i)

r-Output index **r.(r=1…,t)**

s- Input index **s.(s=1….,m)**

u_r-Output index weigh **r**

v_s-Input index weigh **s**

y_{ir}- Amount of output index **r** part **i**

x^{i}_{ds}- Amount of input index **s** department **d** in part **i**

y^{i}_{dr}- Amount of output index **r** department **d** in part **i**

$P_{ii`}$- operation of part **i** with part **i`** view in store

$P_{dd`}$-Department operation **d** with department **d`** view in part **i**

Stage 1- Calculate the overall indicator of the competition of higher level evaluators

Step1- Imagine x_{is} and y_{ir} Was in order to amounts of input and output of part **i**. (High level assessors). It should be noted that these values can include the total or average of the department inputs and outputs in compare with itself (self assessment), performed by the following model that Limits 3 and 4 are related to determining the importance of the indicators.

$$MAX\ P_{i.i.} = \frac{\sum_{r=1}^{t} u_r y_{i.r}}{\sum_{s=1}^{m} v_s\, x_{i.s}}$$

$$\frac{\sum_{r=1}^{t} u_{rii'} y_{ir}}{\sum_{s=1}^{m} v_{sii'}\, x_{is}} \leq 1\ , \quad i = 1, \dots, n$$

$$u_r, v_s \geq 0$$

$$L_{rr'} \leq \frac{u_r}{u_{r'}} \leq U_{rr'}$$

$$L_{ss'} \leq \frac{v_s}{v_{s'}} \leq U_{ss'}$$

Step 2: In order to more accurately differentiate between units, in addition to calculating the absolute efficiency score of each unit in step 1, their performance score is determined in compare with another units . In the following, steps 3 and 4 Is done to complete the scoring process. In this way, the equivalent order of two of the n sections model is designed and solved. The method of work is that the efficiency score of each section obtained from the previous step is calculated as a limitation in comparative models with other sections , on the other hand efficiency score of part i` with this opinion calculated that efficiency score of part i` is equal with $P_{i'i'.}$ evaluating part **I** in compare with part **I** calculating with below formula :

$$MAX\ P_{i.i'} = \frac{\sum_{r=1}^{t} u_{rii'} y_{i.r}}{\sum_{s=1}^{m} v_{sii'}\, x_{i.s}}$$

$$\frac{\sum_{r=1}^{t} u_{rii'} y_{ir}}{\sum_{s=1}^{m} v_{sii'}\, x_{is}} \leq 1\ , \quad i = 1, \dots, n$$

$$u_r, v_s \geq 0$$
$$L_{rr'} \leq \frac{u_r}{u_{r'}} \leq U_{rr'}$$
$$L_{ss'} \leq \frac{v_s}{v_{s'}} \leq U_{ss'}$$
$$\frac{\sum_{r=1}^{t} u_{rii'} y_{i'r}}{\sum_{s=1}^{m} v_{sii'} x_{i's}} = P_{i'i'}$$

Due to the addition of the last limitation in equation form, the justified ground area is severely reduced, which in some models leads to the elimination of the justified area and the creation of an unjustified state. To solve this problem, two solutions are presented below:

A) In accordance with Fig. 2, the last limitation is removed from the equation, and instead of , the two upper limits equal $P_{i'i'} \pm \varepsilon$ replaced on $P_{ii}$and the amount of ε , from necessary amount 0.0001 start and if not impossible answer amount ε multiplications on 10, thereby the error rate increase and re-running the model until the model Get out of the stagnant.

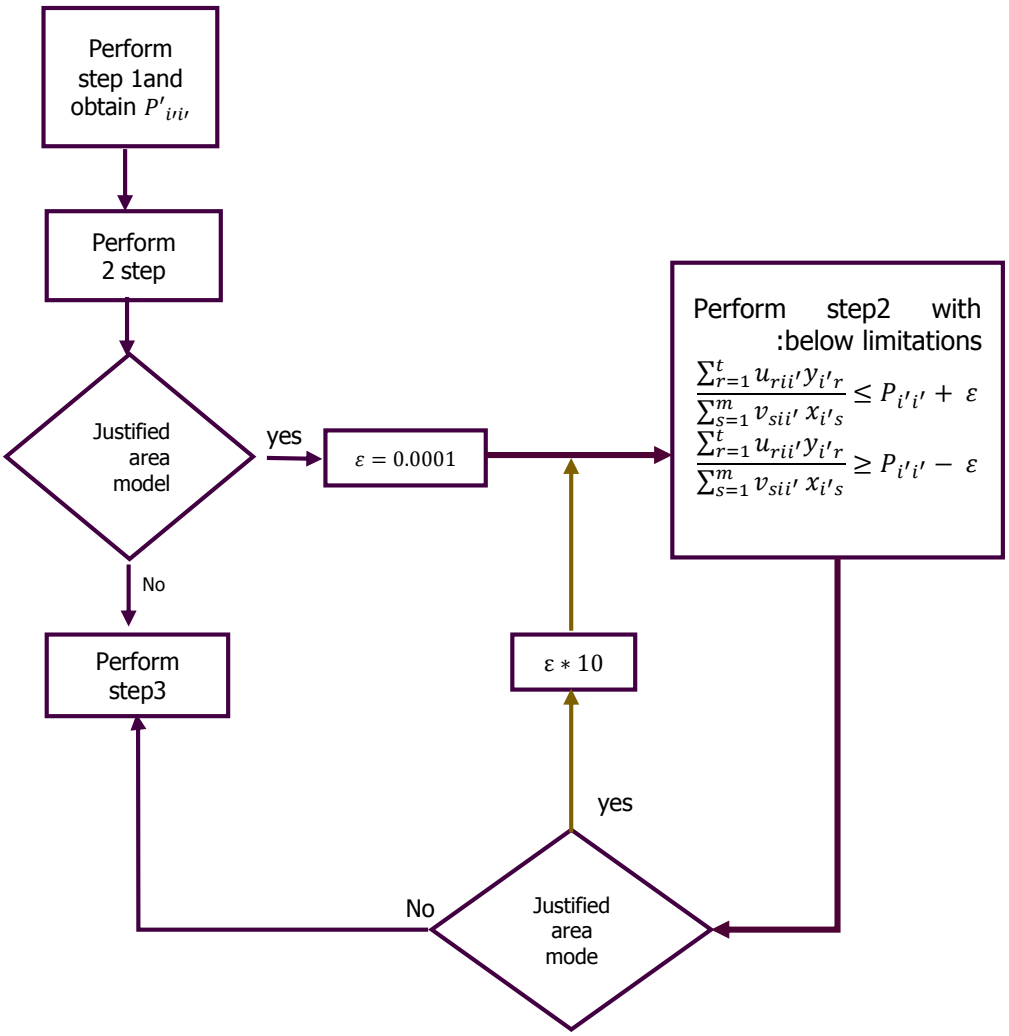
B) The last limitation is defined as an ideal limit. Since the main function of the system is the system model and the last equation is ideal, the first priority in solving is the Leksicograf method by inserting the main objective function of the model, which added as a system limitation to constraints in solving model with the final ideal function.

Output of a bow step, is a n ×n matric according to table 1 that main diameter is absolute assessments and another elements of comparative efficiency .

Table 1-Absolute efficiency score (step1) and comparative(step2) first level evaluation.

	section1	Section2	.	Section n
Section1	P_{11}	P_{12}	. . .	P_{1n}
Section2	P_{21}	P_{22}	. . .	P_{2n}
. . .				
Section n	P_{n1}	P_{n2}	. . .	P_{nn}

Fig 2-An innovative algorithm provided



Step 3-The competitive component index of the two sections, i and i, shows how much part I is more competitive than i, is a relative size calculated using the following formula, and finally a partial symmetric matrix will be obtained according to Table **2**

$$IC_{ii'} = (P_{ii} + P_{ii'}) - (P_{i'i'} + P_{i'i})$$

Table 2 **The competitive component of first level evaluations**

	Section1	Section2	. . .	Section n
Section1		IC_{12}	. . .	IC_{1n}
Section2	IC_{21}		. . .	IC_{2n}
. . .				
Section n	IC_{n1}	IC_{n2}	. . .	

Step4- From the Competitive Minimum Index, we can reduce the overall competitiveness index by the sum of the relative competitive indices of each evaluated. The overall competition score for section i is obtained from the following formula:

$$IC_i = \sum_{i'} IC_{ii'}$$

Stage 2: Calculate the overall indicator of competition for lower level evaluators

Step 1 Imagine x^i_{ds} and y^i_{dr} in order are amounts of output and input in department d in par I. In this step department in part I was compared with each other They are compared with each other and this is repeated for all parts. Therefore, the used indexes to compare the departments of each section are similar to each other (homogeneity condition) can be different from the indicators used in the evaluation of departments in the other section. Evaluating all lower level to compare with each other happened in next stage .Evaluating department d in compare with itself (self assessment) and in her own part, it is done by the following mode:

$$MAX\ P^i_{d.d.} = \frac{\sum_{r=1}^{t} u_r y^i_{d.r}}{\sum_{s=1}^{m} v_s\, x^i_{d.s}}$$

$$\frac{\sum_{r=1}^{t} u_r y^i_{dr}}{\sum_{s=1}^{m} v_s\, x^i_{ds}} \le 1\ , \quad d^i = 1, \dots, l^i \qquad in\ sector\ i$$

$$u_r, v_s \ge 0$$

$$L_{rr'} \le \frac{u_r}{u_{r'}} \le U_{rr'}$$

$$L_{ss'} \le \frac{v_s}{v_{s'}} \le U_{ss'}$$

Step 2 In this step, the performance score of department d in Section I is examined against the other departments in the subsection I. If the efficiency score of department d` obtained from the previous step is considered as a constraint in the next model . The evaluation of department d in comparison with department d' (assuming that both departments are compared in section i.) is calculated by using the following formula:

$$MAX\ P^i_{d.d.'} = \frac{\sum_{r=1}^{t} u_{rdd'} y^i_{d.r}}{\sum_{s=1}^{m} v_{sdd'}\, x^i_{d.s}}$$

$$\frac{\sum_{r=1}^{t} u_{rdd'} y^i_{dr}}{\sum_{s=1}^{m} v_{sdd'}\, x^i_{ds}} \le 1\ , \quad d^i = 1, \dots, l^i$$

$$u_r, v_s \ge 0$$

$$L_{rr'} \le \frac{u_r}{u_{r'}} \le U_{rr'}$$

$$L_{ss'} \leq \frac{v_s}{v_{s'}} \leq U_{ss'}$$
$$\frac{\sum_{r=1}^{t} u_{rdd'} y_{d'r}^{i}}{\sum_{s=1}^{m} v_{sdd'} x_{d's}^{i}} = P_{d'd'}^{i}$$

Step 3-competitive index between d and d` that shows department d how much is more competitive than department d` calculated with following formula**:**

$$IC_{dd'} = (P_{dd} + P_{dd'}) - (P_{d'd'} + P_{d'd})$$

Step4-From the Competitive Minimum Index, the Competitive Indicator can be deduced from the total Competitive Relative Indicators. The overall Competitive Index for Department D is obtained through the following formula**:**

$$IC_d = \sum_{d'} IC_{dd'}$$

Stage3 Calculate the performance of lower level evaluators

The sections performance score (higher level) were separately calculated in step 1 and the departments scores (lower level) were also separately calculated in their respective sections in stage 2. The results of the evaluators' performance up to this stage, are without affecting their higher or lower levels, and also would not allow comparisons between departments of all sections , and only departments can be compared in each section, because each department is only rated in comparison with its subsidiary departments. To this end, there is a need to combine these scores. The researchers in the present study, according to the following equation, that representing a better concept of the hierarchy, proposed a multiplication of these two scores, and also provides a more precise distinction between similar units.

$$IOC_d = \left(IC_d^i * IC_i\right)$$

Since the higher-level assessment indicators are similar for all units and units are homogeneous, it is possible to compare the lower-level evaluators with non-homogeneity.

Stage 4 - Calculate the performance of higher level evaluators

Since the number of evaluated units at the upper levels is limited, so there is a drawback in distinguishing between the efficiency of these units. In addition, the following procedure is recommended for ranking and a better breakdown of units at high levels (sections). In the case of

sectors with a total score of less than one, the same score applies to stage 1, and for those with performance grades equal to one, in order to rank and differentiate more than the average of the department The subsections of those sections are used as the performance score of the relevant section in accordance with Equation 10**.**

$$IOC_i = \frac{\sum_{d^i=1}^{l^i} IC_d^i}{l^i}$$

4-Research findings

For different sections of the study, from comparing the separation obtained result in step 1 & 4 in stage 1 & 4 and for the departments from the results of steps 1 & 4, stage2 & 3 ,was used. The results of the separation comparison of the efficiency differentiation of the higher and lower levels of evaluators are presented in Tables 3 and 4, . For example, Section 1, with a functional score of 0.69, achieved a score of 1.01 from a partial competitive index and obtained a score of 4.2 from the overall competitive index. As you can see, sections with higher performance scores have better scores in the next benchmarking index, and noteworthy is that for Sections 2, 3 and 7, all of which in the first step have equal grades performance to one to In the next stages of the research, they have been largely separated, and a rather large distinction has been made between these parts at a later stage.

Table 3-Calculated efficiency scores for upper evaluators in different research`s stages

Section number	P_{ii}	IC_i	IOC_i
1	0.69	1.01	4.2
2	1	4.4	13.02
3	1	4.04	3.59
4	0.51	0	0
5	0.89	4.21	12.12
6	0.69	1.12	7.2
7	1	5.31	3.77
Number of efficiency units	3	0	0
Standard deviation	0.2	2.09	4.79

Table 4- Calculated efficiency scores for lower evaluators in different research`s stages

Part number	department	P_{dd}^{i}	IC_d	IOC_d	Part number	Department	P_{dd}^{i}	IC_d	IOC_d
1	Dmu01	0/45	4/34	4/3834	5	Dmu01	1	4/09	17/2189
1	Dmu02	0/65	6/08	6/1408	5	Dmu02	0/38	1/97	8/2937
1	Dmu03	0/04	0	0	5	Dmu03	1	3/72	15/6612
1	Dmu04	0/57	4/53	4/5753	5	Dmu04	0/9	4/62	19/4502
1	Dmu05	0/61	5/85	5/9085	5	Dmu05	0/16	0	0
2	Dmu01	0/36	0	0	6	Dmu01	1	8/04	9/0048
2	Dmu02	0/93	4/2	18/48	6	Dmu02	0/54	5/3	5/936
2	Dmu03	0/74	2/53	11/132	6	Dmu03	0/6	4/55	5/096
2	Dmu04	0/78	2/23	9/812	6	Dmu04	0/57	4/33	4/8496
2	Dmu05	1	4/24	18/656	6	Dmu05	0/38	2/71	3/0352
2	Dmu06	1	3/61	15/884	6	Dmu06	0/36	0	0
2	Dmu07	0/82	4/2	18/48	6	Dmu07	1	16/43	18/4016
2	Dmu08	1	4/96	21/824	6	Dmu08	0/55	7/48	8/3776
2	Dmu09	0/63	0/67	2/948	6	Dmu09	0/45	4/28	4/7936
3	Dmu01	0/42	1/02	4/1208	6	Dmu10	1	14/58	16/3296
3	Dmu02	0/35	0/12	0/4848	6	Dmu11	1	12/17	13/6304
3	Dmu03	0/53	2/4	9/696	6	Dmu12	0/38	6	6/72
3	Dmu04	0/42	0/46	1/8584	6	Dmu13	0/65	7/89	8/8368
3	Dmu05	0/33	0	0	6	Dmu14	0/41	2/22	2/4864
3	Dmu06	0/48	1/34	5/4136	6	Dmu15	0/4	0/47	0/5264
4	Dmu01	0/35	1/88	0	7	Dmu01	0/73	0	0
4	Dmu02	0/56	2/34	0	7	Dmu02	0/97	0/64	3/3984
4	Dmu03	0/24	2/16	0	7	Dmu03	1	1/49	7/9119
4	Dmu04	0/21	0	0	Efficiency units number		10	0	0
4	Dmu05	0/18	0	0	Standard deviation		0/281	3/585	6/611
4	Dmu06	0/18	0	0					

As the number of units placed on the efficiency boundary and the standard deviation of the scores of the assessors at different stages show , they are added by completing the calculation steps on the differentiation of the evaluated ones.

5-Discussion and conclusion

In this study, in addition to applying mathematical models in real-world, has raised improvements and ideas to existing models of data envelopment analysis, also has overcome weaknesses and deficiencies in the implementation. In this research, we tried with representing two innovative methods overcome the problems encountered in the proposed method, Di and Abdul Aziz (2011), despite the constraint of the equilibrium that confronts the intricacies of some of the models. Also, for further differentiation in

the higher level evaluators results , a hierarchical approach suggested was proposed by the researcher. This method, at each step that went ahead, increased the distinction between the decision-making units until it was fully ranked. The combination of two models of hierarchy and honeymoon was another challenge for the researchers in the present study that by developing the confidence-based method for the hierarchical model can consider the importance of different indicators in the evaluation.

This research has helped management science in three phases. The first phase was ,applied data envelopment analysis models in the real world and the identification and selection of the best model among different types of data envelopment analysis models. As discussed earlier, the issue ahead in this study was performance evaluation in an organization with a hierarchical structure that the evaluation indicators had different importance to the organization managers and the researcher should try to the resolve the organization managers needs. The second phase was implementation of the formulated mathematical model for a large number of decision-making units, that large number of decision-making units, led to an increase in the number of implemented models of data envelopment analysis, and for this purpose, the researcher began to write a software program that these models can be executed systematically and manually removed from the run. The third phase also addressed a problem that may have not been encountered by former researchers in previous studies, which the same problem was misconception of the answers. This problem encountered a researcher with a serious problem and led to a researcher's innovative proposal.

The results of this research can be used to develop units, promote and reduce managers, pay and reward, and develop or reduce the scope of supervision of managers in different hierarchy of organization. For example, you can normalize the performance scores and multiply the total sales of the organization to get these share numbers and bonus amounts for each department**.**

6-Future suggestion

One of the assumptions of the research is to consider two levels of assessors, which suggests that future research models should be developed with a larger number of evaluated levels. From other assumptions of research, considering the same weights for each indicator in all departments and sections, it is suggested that in subsequent researches weights of indicators for each departments with another departments should be considered different For example, in the hypermarket industry, supermarket departments that constitute a large volume of sales should have a higher sales index, and non-supermarket departments with seasonal sales and more focus on profits can have more importance in the index of profits.

7-sourses

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