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Acquiring Targets in Balanced Scorecard Method by Data Envelopment Analysis Technique and its Application in Commercial Banks

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Abstract

In this article we use data envelopment analysis technique for acquiring targets in balanced scorecard method.
Our target is creating a method which can be applied in balanced scorecard (BSC) to identify the targets in new period, determine the targets by viewing the previous function of the units, perspectives and determined indexes and identify efficient units and create the margin of figurative efficiency for new period. In this case we use Data Envelopment Analysis (DEA) and can identify the condition of being MPSS for all units in new period and use proper pattern to estimate the volume of increase or decrease in each perspective.
Then the brief description from the history of two techniques of balanced scorecard and data envelopment analysis is presented and in 3rd section, the new combined methods of DEA & BSC are described in details. And at the end the executive model of this new method in Iran's banks are delivered.

Keywords: Data Envelopment Analysis (DEA); Balanced Scorecards (BSC); Efficiency; Return to Scale; Most Productivity Scale Size (MPSS).

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1- Introduction

In this article we present a mathematical method to calculate targets for new periods of planning by BSC by applying DEA.
One of the main deviations of planning for increase and decrease the targets in new working period for perspectives, is estimating more than exception less or more.
We start from a little sooner: importance and necessity of having strategy and determining targets and identifying the scope and route of the strategy in the organization, there is no debt that this important case is one of the bases of the organization to develop and improve.
BSC is a management tool includes all criteria and evaluations and is arranged in the groups such as card. [5] These criteria comprise all aspects of the organization and relate to 4 important management points of view and their aim is helping senior managers to possess wider perspective toward their positions and organizations.
The cards of balanced scorecard indicate the function of financial structure, marketing application, internal strategic dimensions and role of human forces in the organization. BSC mixes the financial and applied criteria and emphasizes their application in sort term and long term bases in the organization. When this approach was achieved, just the financial and traditional criteria are not useful to create the useful and complete approach of organized function or productivity. Then BSC will be considered. [1]
One of the special models for the projects was suggested by Stewart for the first time. [7]
DEA is a mathematical technique to calculate the proportional efficiency of determinant units according to the observed input and output which are stated by different kinds and sizes. [6,8] From the subcategory and derivative of DEA we can point return to scale and MPSS which indicate good function in the management. At the following we will describe them briefly.

2- Literature review

In this article we use an analytical model which target is calculating increase and decrease of the volume of strategy of each perspective in new period for BSC in which MPSS of data envelopment analysis technique is used. One of the most important decisions of management of each organization is determining the targets of new periods of the organization for each unit of the subcategory in each perspective which effects on the function of the strategy of the organization. Actually, we use DEA in this step of deciding to acquire new targets.
At the following we identify the brief history of used techniques in our combined method, i.e. balanced scorecard and data envelopment analysis.

2-1 Data envelopment analysis

Data envelopment analysis was established by Charnes and et al [8] on 1987 which was changed into one of the scientific management method for evaluation of the function. CCR model was innovated by Charnes and et al [8] and some years later, BCC model was developed [15] and both of them are DEA basic models.

DEA was used for proportional evaluation of determinate units by applying mathematical planning. The proportional expression means the efficiency results by the comparison of units with each other. One of the advantages of this method is that DEA estimates the production function. (Production function is a function which gives the maximum output for each combination of input [4] by which we can judge the way of function of DMU.

The main DEA model investigates the proportional efficiency of DMU. Actually it is the proportion of weighted outputs to weighted inputs. It indicates proportional effects impressed from each DMU in their efficiency bound [5].

DEA processes are available in the model by severe control of weights. One comprehensive resolution for weights controlling is cone-ratio method [17], it means the value foe input and output weights is limited as the cone –ratio.

Also on 1984, Banker identified the maximum value of production scale as the production value which possesses the maximum average toward each figurative production unit which shares the same DMU 0 input and output compound. Actually, for T production possibility complex, the maximum production scale value is the scaled value in which the produced output by each unit is the maximum inputs. Therefore the possibility of production of (X_0,Y_0)in T of one MPSS (Most Productivity Scale Size) is available if and if for each α and ß that (ß X_0, αY_0) was a member of T, therefore $\alpha/ß \leq 1$. It means that foe increasing of productivity there shall be movement up to $\alpha/ß \neq 1$. Therefore the possibility of production of (X_0,Y_0) is one MPSS when the return to scale of this unit was not increasing or decreasing.

Our first duty in developing a model based on DEA is selecting a formula which was the best concerning the nature of that organization and case. For example, in evaluation of one an organization with different DMU and different resources which are competitive with the similar resources; the best model of return to scale is variable which was developed by Banker and et al [15] and was known as BCC.

Also CCR model which was developed by Charnes and et al [8] was one of the basic DEA models. Our main model to evaluate the function in this article is BCC.

On 1984, banker identified the maximum value of production scale as the production value which possessed the maximum production average for each figurative production unit which share that DMU_0 input and output compound. Actually, for possibility of T production, the maximum value of production scale is the scale value in which the produced output by each unit of input was the maximum. Therefore, the possibility of production of (X_0,Y_0) in T is one MPSS, if and if for each ß, α that (ßx_0, αY_0)€T, then $\alpha/ß \leq 1$. It means that foe increasing the productivity, there shall be movement up to $\alpha/ß > 1$. Therefore, if the possibility of

production (X_0,Y_0) was one MPSS, therefore, the return to scale of this unit is nor increasing or decreasing.
For all MPSS points, α/ß =1.
MPSS is one borderline point which maximizing the production average of α/ß for all input and output. Therefore the concept of MPSS is based on the comparison of (ßx_0, αY_0) input and output.

2-2 Balanced Scorecard

BSC was suggested by Kaplan & Norton [21] as the methodology in solving internal and external problems of the organizations and their improvement. BSC is a tool for balancing one organization with the strategy [22] and considering their total targets and criteria which identify the strategy and target of the organization for units of the organization from top to down.
Traditional Performance Evaluation system, mainly are based upon financial scale which overweight the company‘s short term Profit – deficit and significance effective parameter to company profit, however respectively decreasing all major parameter regarding to expenses such as employee training plans and R & D activities suspension may increase the company’s profit, but will cause company to lose its competitive situation in the market & endanger it’s long term profit. [1] Therefore in order to perform a thorough evaluation of organization Performance, it must be evaluated in 4 perspectives as follows [21] which is one of the aims of comprising method discussed in this session.

- ✓ Financial Vision
- ✓ Customer Vision
- ✓ Internal Process Vision
- ✓ Learning & Growth Vision

In fact BSC method shows, how Learning & Growth of employee conclude to modification of internal processes & well rectification of them. Consequently, it will cause to establish and improve particular value to the customer & market; finally will conduct to increasing the company’s portfolio or its financial improvement.

3- Utilizing DEA method to acquire target in BSC method

To implementing BSC method within organization utilizing a set of steps. In this method, implementing of these stages in operation is not a case and only we have a modification in acquiring target within one of the subsystem of programming. The first stage in BSC implementation is identification and declaration of organization strategy and knowing (understanding) and practicability of organization macro strategy.
BSC method starts with organization strategy, and clears all dimensions of strategy to flow all organization activities around established strategy. In election stage, where the main bases in index election will specified for Performance

evaluation, BSC could be effective in clearing of viewpoints, strategy and proper criteria, considering of DMU(s). [1]
After organization strategy and goals characterizing, BSC start mapping the organization around strategy, and In this case, establish & specify all perspective around organization strategy. Consequently, after perspective characterization and its indexes, it's time to data gathering of indexes situation. We must well know by past situation of indexes and their performance. Then, the identification of changes (Increase / Decrease) within each index would be performed, and in fact we start from here.

On the other hand, we know that, within DEA technique, indexes will divided into two type of input – Output. Therefore, to utilize DEA in this stage of BSC, it would be divide the indexes within each perspective as input-output, then draw efficiency border for each DMU within organization. Utilizing model to calculating of efficiency is BCC control weight.

$$
\begin{aligned}
&RW-BCC\\
&Max \quad U^{\mathrm{T}}Y_k + u_0\\
&S.t. \quad U^{\mathrm{T}}Y_j - V^{\mathrm{T}}X_j + u_0 \le 0 \ , \ \mathrm{j}=1,...,\mathrm{n}\\
&\qquad V^{\mathrm{T}}X_P = 1 \qquad (1)\\
&\qquad A\mathrm{U} \le 0\\
&\qquad B\mathrm{V} \le 0\\
&\qquad U \ge 1\varepsilon \ , \ V \ge 1\varepsilon
\end{aligned}
$$

Since there were no understanding about return to scale of community members, so there were no alternative but to utilizing BCC model to solve the problem. Also because of restriction applied from organization top management to the rational importance of input-output regarding to indexes we had to utilize scale control method.
After characterizing the rational efficient units of each DMU's efficiency, so inefficient units have a retard related to the efficient units, because they couldn't be efficient in techniques.
it is very important than other to specify the origin and resources of the inefficiency value and to compensate this, put the steps to got the efficiency borders.
In fact, our assumption is that the units which couldn't got efficiency in last periods, means that they couldn't obtain their planning, so, before targeting for next period, these units should compensate their last inefficiency and then acquiring the target.
Our aiming is to compensation of inefficiency and renew the planning. It means that inefficient units are under more pressure within this period to compensate last inefficiency and acquire new target.

Assume that:
P: The value of I_K in DMU at present time.
S: Efficiency value of I_K in last period.
t: Deviation from DMU prospective target within I_K in new period.
t*: Deviation from DMU prospective target within IK in new period, considering MPSS model.
T*: Optimized I_K in new period (the value which I_K should acquire).

Within calculation in last method and ignoring inefficiency, the value which J unit should acquire in I_K is as follows:

Target DMUj (I_K) = P+t

Now we pointed out that, the value inefficiency of J unit in I_K was as S. So, the inefficiency should be compensated as S value within new period of targeting. It means:

Target DMUj (I_K) = P+t+S

In the following we specify the precise value of t which we called t*. In this case, the units which are MPSS within different period would be identified. After specifying the MPSS DMU, it might prospect new target for indexes. Within this prospect does not necessarily specify precise value of target for future period and only considered to established new efficiency border and optimizing targets to new period. Also, the implementation method is same to traditional target specifying in BSC model. Now through mentioned prospecting we established a virtual efficiency border in new period, and could recognize MPSS units through Cooper or Russell modified model.

$$\textbf{Min} \quad \mathrm{Re} = \frac{\frac{1}{m}\sum_{i=1}^{m}\theta_i}{\frac{1}{s}\sum_{r=1}^{s}\varphi_r}$$

$$\textbf{st} \quad x_{ji} - \sum_{j=1}^{n}\lambda_j x_{ji} \leq 0 \qquad i = 1,\ldots,m$$

$$\sum_{j=1}^{n}\lambda_j y_{jr} - \varphi_r y_{jr} \geq 0 \qquad r = 1,\ldots,s$$

$$\theta_i \leq 1, \qquad i = 1,\ldots,m$$

$$\varphi_r \geq 1, \qquad r = 1,\ldots,s$$

$$\lambda_j \geq 0, \qquad j = 1,\ldots,n$$

$$\left(\frac{\theta^* X_p - S^{-*}}{\sum_j \lambda_j^*} , \frac{Y_p + S^{+*}}{\sum_j \lambda_j^*} \right)$$

In fact, as per our forecasting for new period, we could able to ask this question that, if we acquire new identified target in ideal situation, will all of our units become efficient and MPSS? It means that, whether our forecast could efficient them, considering their target acquiring within BSC? In case that after drawing of efficiency borders, all units would be subjected to acceptable situation on the efficiency borders, and there were no meaningful differences between those units and MPSS, therefore defined target for new indexes is correct and there is no need to modification. But in case that, despite new targets, units are still inefficient and not close to MPSS, what should we do?

Now, we must draw virtual efficient borders, recognize inefficient DMUs, and identify indexes which caused to inefficiency and also detect units which virtually became MPSS and benchmarking DMUs indexes of MPSS to other units and specify that:
If virtual inefficient units tend to become efficient, it would modify their indexes as S value (Decrease or increase), and to become MPSS they should obtain t value.

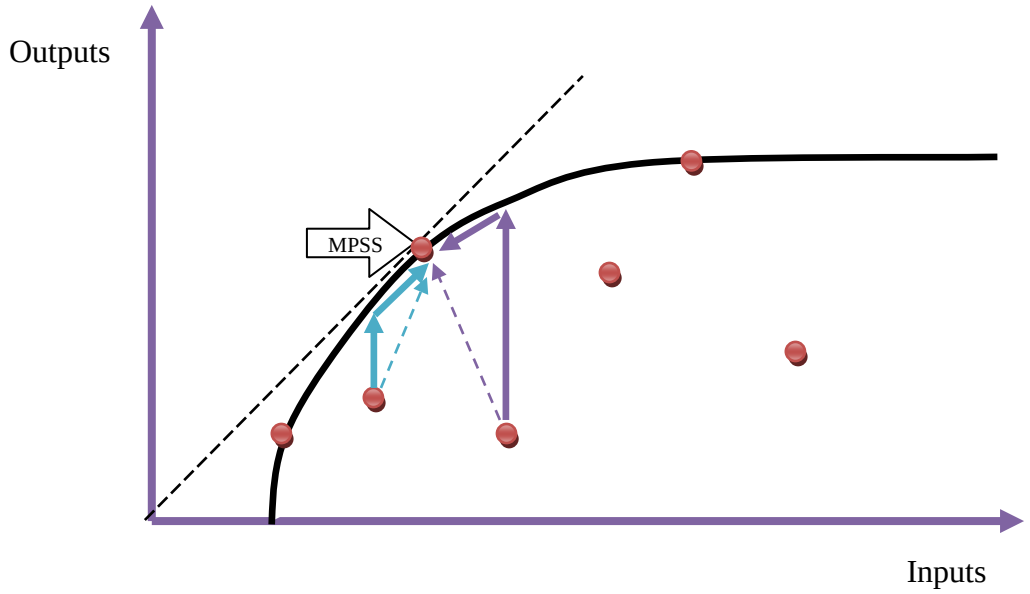


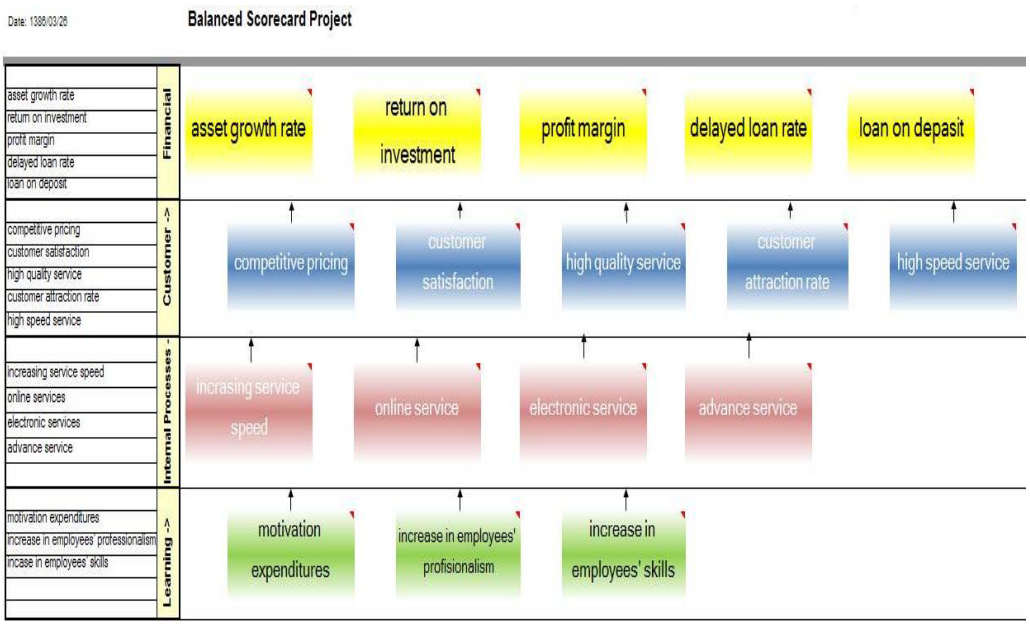
Figure 1: MPSS

Therefore, for targeting of indexes in new period, we are able to specify clearly that, I_i unit to become efficient, would be modified in K_i as S_k, So, if it has positive

performance, to become MPSS, it could acquire t* value. It means that proper value for Ki of DMUi is equal to T*=t*.

4- Operating Model

Within this research, 6 Iranian commercial banks were studied and verify preliminary BSC steps within organization. After drawing strategy map, and specifying borders and coordination of strategy, it should benchmark the organization activities about strategy and identifies related indexes to each perspective considering BSC requirements. Within 4 BSC's perspective (Financial, Customer, Internal Process and Learning & Growth) the related indexes have been specified as following table and their correctness reconfirmation has been done.



The data gathered from 6 commercial banks within 5 periods from 2002 to 2006 and are as follows. Considering mentioned indexes, given data are as following tables:

Table 1: Data 2002 to 2006

		Financial					Costumer				
		O1	O2	O3	I1	I2	I1	O1	O2	O3	O4
DMU1	2002	17.62%	5.72%	1.55%	60.45%	2.54%	25.88%	3.25%	3.19%	25.85%	3.13%
	2003	52.27%	2.17%	2.51%	52.54%	3.27%	52.04%	3.25%	3.19%	26.77%	3.13%
	2004	35.11%	9.00%	1.50%	53.82%	3.43%	38.02%	3.25%	3.19%	24.33%	3.13%
	2005	32.15%	9.15%	3.13%	47.19%	3.66%	28.93%	3.25%	3.19%	23.96%	3.13%
	2006	17.42%	4.81%	1.48%	52.84%	2.68%	15.70%	3.25%	3.19%	22.91%	3.13%
DMU2	2002	23.81%	15.04%	2.87%	55.59%	5.95%	33.44%	3.21%	3.61%	24.04%	3.41%
	2003	94.80%	15.22%	2.96%	52.70%	5.13%	93.20%	3.21%	3.61%	49.76%	3.41%
	2004	47.97%	12.95%	2.37%	52.76%	3.47%	69.45%	3.21%	3.61%	38.80%	3.41%
	2005	37.56%	12.49%	2.68%	41.87%	5.10%	45.40%	3.21%	3.61%	20.00%	3.41%
	2006	12.98%	7.16%	2.62%	42.77%	9.50%	18.90%	3.21%	3.61%	25.80%	3.41%
DMU3	2002	8.86%	-0.02%	2.74%	61.74%	11.32%	14.91%	3.41%	3.34%	23.97%	3.25%
	2003	58.21%	6.30%	4.17%	47.42%	13.09%	69.75%	3.41%	3.34%	40.62%	3.25%
	2004	26.88%	5.40%	3.54%	46.50%	17.39%	18.94%	3.41%	3.34%	18.77%	3.25%
	2005	21.76%	10.00%	17.00%	69.00%	17.00%	-26.00%	3.41%	3.34%	21.00%	3.25%
	2006	47.59%	7.00%	8.00%	60.00%	15.00%	34.00%	3.41%	3.34%	29.00%	3.25%
DMU4	2002	73.58%	0.44%	3.05%	55.97%	2.57%	24.40%	3.12%	3.41%	27.28%	3.32%
	2003	50.56%	1.50%	3.43%	49.21%	4.57%	61.06%	3.12%	3.41%	32.71%	3.32%
	2004	27.02%	0.76%	2.65%	52.07%	3.44%	52.65%	3.12%	3.41%	22.60%	3.32%
	2005	49.71%	1.90%	4.00%	51.50%	5.20%	33.20%	3.12%	3.41%	29.30%	3.32%
	2006	18.90%	1.40%	2.70%	60.20%	8.50%	33.50%	3.12%	3.41%	34.50%	3.32%
DMU5	2002	68.14%	0.31%	2.65%	54.52%	2.49%	108.70%	3.43%	3.39%	36.10%	3.25%
	2003	31.30%	0.73%	2.61%	52.87%	2.52%	34.79%	3.43%	3.39%	32.65%	3.25%
	2004	31.16%	0.72%	2.36%	54.43%	2.40%	36.75%	3.43%	3.39%	24.50%	3.25%
	2005	45.90%	1.53%	3.00%	53.20%	5.60%	44.50%	3.43%	3.39%	24.20%	3.25%
	2006	20.13%	1.23%	3.00%	57.90%	7.30%	30.40%	3.43%	3.39%	21.80%	3.25%
DMU6	2002	70.53%	27.02%	6.00%	29.43%	4.31%	74.14%	3.74%	3.50%	73.49%	3.37%
	2003	36.41%	28.78%	5.61%	40.07%	6.68%	22.48%	3.74%	3.50%	46.37%	3.37%
	2004	33.21%	6.14%	3.13%	55.91%	6.42%	44.41%	3.74%	3.50%	38.48%	3.37%
	2005	47.99%	10.60%	4.00%	96.00%	4.00%	79.00%	3.74%	3.50%	34.00%	3.37%
	2006	10.29%	10.20%	4.00%	96.00%	14.00%	12.00%	3.74%	3.50%	13.00%	3.37%

		Internal Process				Internal Process		
		I1	O1	12	O2	I1	I2	O1
DMU1	2002	210	1208	0	37	25.75%	12.14	74.52
	2003	482	1262	734	59	22.09%	12.1	48.57
	2004	528	1278	832	72	23.15%	12.11	55.84
	2005	571	1325	1125	83	18.14%	12.05	52.38
	2006	800	1376	1305	91	23.03%	12.11	58.54
DMU2	2002	20	0	0	29	24.54%	12.03	78.12
	2003	119	0	0	38	19.05%	11.97	52
	2004	119	426	430	47	19.85%	11.98	54.34
	2005	501	1183	1192	56	16.77%	11.94	22.88
	2006	692	1896	1906	57	18.72%	11.96	30.8
DMU3	2002	85	311	311	38	22.18%	12.13	55.46
	2003	250	535	532	39	19.28%	12.09	48.21
	2004	330	1113	1130	42	19.33%	12.09	48.32
	2005	537	1222	1344	49	18.00%	12.08	45
	2006	718	1842	1758	58	18.50%	12.08	46.25
DMU4	2002	126	183	1365	21	3.26%	12.05	11.4
	2003	278	503	1475	27	2.10%	12.04	7.34
	2004	369	754	1493	32	1.56%	12.03	5.45
	2005	394	904	1489	35	6.30%	12.09	22.05
	2006	682	1315	1500	37	5.30%	12.07	18.55
DMU5	2002	22	0	0	15	25.96%	12.07	59.71
	2003	116	0	0	20	22.60%	12.03	51.99
	2004	302	0	0	25	20.52%	12.01	47.2
	2005	481	395	420	30	19.00%	11.99	43.7
	2006	643	787	745	34	17.00%	11.96	39.1
DMU6	2002	25	25	25	0	26.80%	13.62	61.64
	2003	283	290	290	1	25.83%	13.61	59.42
	2004	299	301	301	7	28.04%	13.64	64.48
	2005	308	333	333	9	21.00%	13.54	48.3
	2006	555	510	517	10	30.00%	13.66	69

Through given data, the organization past performance is clearly shown, and now it's time to prospect to new period for acquiring targets. Prospecting algorithm for new indexes is same to BSC method. In this situation, all indexes within distinct perspectives will present to organization top management, then considering organization exterior objects, experts ideas gather and after collecting all ideas, the indexes' target for new period will be specify.
Therefore, data for new period planning with BSC are as follows:

Table 2: financial index outputs and inputs in new period

		I1	I2	O1	O2	O3
2007	DMU1	0.45926	0.01962	0.51667	0.19983	0.03092
	DMU2	0.33944	0.06422	0.51688	0.15224	0.02960
	DMU3	0.46077	0.13235	0.84234	0.12963	0.12170
	DMU4	0.52933	0.06398	0.34769	0.03484	0.04076
	DMU5	0.56144	0.06952	0.29648	0.02897	0.03813
	DMU6	0.96000	0.08723	0.14866	0.17601	0.05113

Table 3: customer index outputs and inputs in new period

		I1	**O1**	**O2**	**O3**	**O4**
2007	DMU1	0.31570	0.03250	0.03190	0.23722	0.03130
	DMU2	0.52668	0.03210	0.03610	0.53396	0.03410
	DMU3	0.69747	0.03410	0.03340	0.49147	0.03250
	DMU4	0.83851	0.03120	0.03410	0.44725	0.03320
	DMU5	0.36806	0.03430	0.03390	0.36101	0.03250
	DMU6	0.23710	0.03740	0.03500	0.34000	0.03370

Table 4: internal process index outputs and inputs in new period

		I1	**I2**	**O1**	**O2**
2007	DMU1	907	1691	1410	108
	DMU2	842	2173	2236	68
	DMU3	824	2161	2138	60
	DMU4	755	1550	1574	42
	DMU5	820	806	836	39
	DMU6	577	627	570	14

Table 5: learning and growth index outputs and inputs in new period

		I1	**I2**	**O1**
2007	DMU1	0.2924	12.1664	74.5243
	DMU2	0.2090	11.9852	78.1234
	DMU3	0.1901	12.0883	55.4612
	DMU4	0.0630	12.1312	55.6500
	DMU5	0.2596	12.0703	59.7115
	DMU6	0.4286	13.6636	69.0000

Now it's time to DEA which is solvable through given model. At first we should draw a virtual efficiency border for new period, and then unit efficiency would be specified. In this case, through association of DEA & MPSS model, the unit which could able to become MPSS in new period will detect and its indexes will benchmark to the other units. So, other units should reach themselves to MPSS unit, for becoming efficient and optimizing their resources.

Through solving BCC multiplying model, within return to constant scale, the change value in indexes is as following tables:

Table 6: Financial perspective

DMU1	**efficiency**	**100%**		
	input	0.4593	0.0196	
	output	0.5167	0.1998	0.0309
DMU2	**efficiency**	**95%**		
	input	0.4602	0.0871	
	output	0.7115	0.1468	0.0852
DMU3	**efficiency**	**100%**		
	input	0.4608	0.1324	
	output	0.8423	0.1112	0.1217
DMU4	**efficiency**	**49%**		
	input	0.4887	0.0591	
	output	0.5269	0.1313	0.0771
DMU5	**efficiency**	**100%**		
	input	0.5614	0.0695	
	output	0.2965	0.029	0.1217
DMU6	**efficiency**	**48%**		
	input	0.4639	0.0422	
	output	0.566	0.1764	0.0513

First line shows the unit efficiency within virtual efficiency border in new period, which indicating rational efficiency of units and their inefficiency within new period planning. Next line (2^{nd} line) shows new input value and next line shows new outputs within virtual efficiency border.
Now, the units have became inefficient, should reach themselves to efficiency borders and then all units move to MPSS. Therefore, a part of new table mentioned here in under as specimen.

Table 7: Result Sample

	Efficiency	I/O	Past	Planning Period	(Increase / Decrease) (S)
			Financial		
DMU1	100%	O1	17.42%	51.67%	34.25%
		O2	4.81%	19.98%	15.17%
		O3	1.48%	3.09%	1.61%
		I1	52.84%	45.93%	-6.91%
		I2	2.68%	1.96%	-0.72%
DMU2	95%	O1	12.98%	71.15%	58.17%
		O2	7.16%	14.68%	7.52%
		O3	2.62%	8.52%	5.90%
		I1	42.77%	46.02%	3.25%
		I2	9.50%	8.71%	-0.79%
.	.	.	.	.	
DMU6	48%	O1	10.29%	56.60%	46.31%
		O2	10.20%	17.64%	7.44%
		O3	4.00%	5.13%	1.13%
		I1	96.00%	46.39%	-49.61%
		I2	14.00%	4.22%	-9.78%

Considering that first unit has efficiency of 100 % it's obvious that, its modification change in related to prospected in new period considered as Zero. But mentioned changes regarding to experts' opinion,(which resulted from BSC algorithm , considering organization exterior objects) should be included. Second unit with 95% efficiency, and actually accounting as inefficient unit in related to new efficiency border, should first compensate its inefficiency, and then move to become MPSS. Therefore, increasing in outputs, increasing in inputs would be changed as per numbers mentioned in tables to become efficient. As well for other units in different perspectives, such these tables should be provided and interpreted.

Now it's time to define the MPSS. To acquiring MPSS we utilized modified Russell's model which previously mentioned and programmed in GAMS software. After solving the model, the outputs would be as follows:

Table 8: Results

MPSS Financial							MPSS Customer					
	I_1	I_2	O_1	O_2	O_3			I_1	O_1	O_2	O_3	O_4
DMU1	67.22%	14.14%	19.88%	39.73%	1.97%		DMU1	56.52%	3.26%	3.55%	52.44%	3.37%
DMU2	51.69%	15.22%	2.96%	33.94%	6.42%		DMU2	52.67%	3.21%	3.61%	53.40%	3.41%
DMU3	84.23%	12.96%	38.42%	46.08%	13.24%		DMU3	69.75%	3.41%	3.34%	49.15%	3.25%
DMU4	54.80%	15.01%	6.35%	35.11%	7.07%		DMU4	54.30%	3.23%	3.58%	52.99%	3.39%
DMU5	67.22%	14.14%	19.88%	39.73%	9.67%		DMU5	60.82%	3.31%	3.48%	51.37%	3.33%
DMU6	76.70%	13.49%	30.21%	43.27%	11.66%		DMU6	65.79%	3.36%	3.40%	50.13%	3.29%

Table 8: Results

MPSS Internal Process						MPSS Learning & Growth			
	I_1	I_2	O_1	O_2			I_1	I_2	O_1
DMU1	838	2214	2170	66		DMU1	20.47%	12.01	73.01
DMU2	842	2236	2173	68		DMU2	20.90%	11.99	78.12
DMU3	842	2138	2161	60		DMU3	19.01%	12.09	55.46
DMU4	840	2227	2172	67		DMU4	20.72%	12.00	75.95
DMU5	833	2189	2167	64		DMU5	20.00%	12.03	67.31
DMU6	828	2161	2164	62		DMU6	19.45%	12.04	60.71

Consequently at the end, inefficient units after compensation their inefficiencies, would reach to virtual new efficiency border, and then move to MPSS direction.

5-Conclusion

In this article, comprising model (DEA & BSC) was utilized to prospect optimized target within provided planned period. Through this model initiate to problem solving, and if there is required to new planning, through utilizing BSC method, prospecting will perform for new period, and utilizing DEA a virtual efficiency

border will draw. In this case, the inefficient units in new prospect period will specify so before initiating new planning period the organization would remove the inefficiency. Finally to approach to MPSS, the organization should drive their indexes to MPSS units. Presented situation will make more secure the new planning, we can move forward with more confidence.

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