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Evaluating the Efficiency and Productivity of Sepah Bank Branches Using Data Envelopment Analysis (DEA) Model

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ABSTRACT

Nowadays banking business is considered as one of the major financial activities of any economic system. Evaluating the performance of the banking systems or any other financial institutions, is an important task. The standard efficiency of the general productivity in a bank is measured by its transforming inputs into outputs. In this study by using Data Envelopment Analysis (DEA) model the efficiency of 53 branches of Sepah Bank in West Azarbaijan province (Iran) is investigated. Analysis of the study shows that average efficiency of the branches is low. Then total productivity of Sepah bank branches evaluated, in which the average productivity of branches shows a decrease in their functionality that are mostly the result technological inefficiency.

Key words: Efficiency, Productivity, Sepah Bank, Data Envelopment Analysis (DEA)

INTRODUCTION

Nowadays banking operation is considered as one of the major financial activities of any economic system that on one side gathers the deposits from the customers and on the other side gives them loans, credits and other bank services [1]. Human being is always trying to achieve more results with less facilities and agents. We can call this appetence achieving a higher efficiency. Meanwhile, efficiency is one of the most important indexes in evaluating optimal performance of financial institutions and the basic step to increase efficiency is its measurement [2]. In today's modern world the partial benefit of producing a product and services is generally based on knowledge and this level of production is not available in developing countries, therefore producing products and services in developing countries is generally possible in decreasing the costs and one of the important factors in decreasing the production costs and providing services is the efficiency of financial institutions [3]. Investigating the performance of countries that have had a great financial development in recent years indicates that most of these countries have achieved this development by increasing the productivity. Therefore, without increasing the productivity and efficiency no economy can expect its development [4]. Efficiency is an index that measures the management of a decision making institution in an optimal using of inputs to produce outputs. When an institution can produce more outputs using fewer inputs, shows that it is more efficient. Between two institutions that produce different amounts of outputs, the one which produces more outputs is not necessarily the more efficient one, because this institution might has produced more outputs by using better and more inputs and facilities than the other institution. Therefore, in talking about efficiency the amount of inputs and outputs is not an important factor, but their rates are significant [5]. It seems that because of a lack in competition among the banks, limitations like employment laws, less competition among the staff, impossibility of management because of some predetermined conditions, stability of the given facilities in the framework of none rate banking, giving loan facilities and lack of increase in the capital of the banks by government and hence, inefficiency of the capital rate, most of Iranian banks are encountered with a lack efficiency. But due to the economic conditions of Iran considering the definition of efficiency, the bank is efficient, that means by using its inputs tries to reach the maximum of its outputs or achieve a fixed output by using the least inputs. We should work in a framework to increase the efficient functionality of the banks [6]. Banks in Iran are working in a controlled economic condition and are not free enough to manage their resources. Therefore, these institutions must decrease their costs to achieve the highest productivity and must use their available inputs in the best way they can and increase the average production of their entire agents [7]. Measuring efficiency has always been considered by researchers for its important role in evaluating the performance of a company or an organization. In 1957 Farl [8], using a method like measuring efficiency in engineering topics, measured the efficiency of a production institution. The case that Farl [8] had considered to measure the efficiency indicated one input and one output. Farl's study [8] was consisted of measuring technical and allocation efficiencies that followed an efficient production [5]. There are lots of local and foreign studies related to the efficiency of the banks.

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Sane Alizadeh[9] in a study evaluated 119 branches of Saderat Bank in Tehran and showed that the average efficiency in conditions of constant and variable return to scale is respectively 74 and 89 percent. Abrishamiand Mehrara [6] did a research in 2003 about Mellat Bank by investigating the costly efficiency of the banking system from 1991 to 2003 using the parametric technique estimated the costly efficiency and results of the research showed that Mellat Bank in this time has had a seven percent costly inefficiency. In 2004, Naderi and Sadeghi[10] in a research by the title of "Investigating the efficiency of none rate banking systems in different countries" and compared none rate and rate banks in the world by using the DEA method and using two methods of CCR and BCC, and achieved that the efficiency in none rate banks in Bahrain and Qatar that work in competitional conditions with the rate banks is more than the efficiency of banks that work in a none rate banking system in Iran, Sudan, and Pakistan. By using the CCR method and comparing 46 none rate banks and 64 rate banks achieved that the efficiency of none rate banking has been less than rate banking in the world. Hadian and Azimi [11] in measuring the efficiency of banking system in Iran between 1997 and 1999 by using DEA method concluded that just Melli, Keshavarzi and Sanat Banks have been efficient technically and financially and Tose'eSaderat Bank has been efficient only technically. Babeiin 2006 [2] did a research about the efficiency of Melli Banks in 29 provinces of the country by using two inputs of " number of employees " and " amount of money in each province" and one agent about the amount of given facilities in each province using the DEA method measured the efficiency of Melli Bank in different provinces of Iran. In 2007 that Dadgar and Niknemat[12] did a research about administration efficiency of Tejarat Bank in Iran by using DEA method concluded that Tejarat Bank between 2001 and 2003 has worked inefficiently. Namdari et al., [3], in a research by using DEA method evaluated the efficiency of the governmental Banks of Iran that Personnel costs and per capita deposit per each employee and property of the banks as the agents and on the other hand the per capita interest gained by each bank per each employee is considered as the output and the results showed that the governmental banks in Iran are in the range of increasing return to scale. Farl[8] in 1957 for the first time talked about estimation of efficiency by a none-parametric method and instead of guessing the production function, studied about the amount of inputs and outputs and introduced a frontier as the efficient frontier. The CCR method with PhD thesis of EdvardRodes under Cooper's guidance started that evaluated the educational progress of students in America in 1978 and Cooper, Charneset al., [13] suggested the BCC model in 1984. In a study that Dos and Gosh performed in 2009 in India after the 1990's economic reformation concluded that financial deregulation that started with aim of increasing efficiency and productivity of the banks that included decreasing the legal savings rate and releasing of the profit rate and increasing competition among the banks and accepting the international accounting standards and having to follow the capital sufficiency and variety in ownership's base and had to be more clear, resulted in increasing the efficiency of banks in India. Stabe et al., [14] evaluated the technical and special efficiency of the banks in Brazil between 2000 and 2007 by using the DEA model, this study showed the inefficiency caused by technical inefficiency and in this period the productivity of the Brazilian Banks was less than the European banks.Shyu and Chiang [15] did a study in 2012 that was about 123 branches of a bank in Taiwan concluded that the branches have scale inefficiency and environmental factors have a meaningful effect on productivity of branches. In another study in 2014 Wang et al., [16] in a research by the title of "Measuring the efficiency of the commercial banks in China" by the two phase model of DEA that from 2003 to 2011 was measured by the BCC model, concluded that all the banking stages are to achieve more money and more income and showed that bank inefficiency in China is caused by the inefficiency in the model of attracting the money and concluded that after reformation of banking system in 2003 the efficiency of the commercial banks in China is improving.

An economy is efficient that uses its resources to produce the product in a way that in the present conditions, it is impossible to produce more than that level and if it cannot produce more than what it is by the existing resources, it shows that the production situation is with the minimum cost. Management of the banks due to the economic conditions of present and future have to make the following decisions: reforming and improving bank services, marketing, budgeting, innovation in giving services, competition with other banks and finally increasing productivity and efficiency among the units under their administration. One of the basic ways of reaching success for the banks to improve the methods of giving services is increasing the competition power of their branches. It is necessary for banks to know about the efficiency of their branches and investigate the reasons of their efficiency and inefficiency and also by making the branches more efficient, Minimize some of the losses caused by them [2]. By performing this study and comparing efficient and inefficient branches of Sepah bank in West Azarbaijan province we can investigate the causes of efficiency and inefficiency of these branches during the time and by finding the weak points and strong points of these branches try to increase the efficiency of the inefficient branches and this way we can increase the efficiency and productivity of Sepah bank throughout the province. Then we can see the productivity of Sepah Bank in West Azarbaijan province in time of investigation and mark the branches that have had an increase in their performance.

MATERIAL AND METODS

Today DEA method is known as a suitable method to evaluate the performance of institutions that in this method according to the existing information the efficient frontier is estimated practically and since all the inputs are covered to achieve the frontier function they have called it "Data Envelopment Analysis" method [17]. DEA is a set of techniques that is used to analyze the production, cost, income and profit data without parameterization and technical indexing [18]. DEA method is a linear mathematical programming method to evaluate the DMU decision making institutions that is managed by some people with this condition that these institutions have a procedure or a system, which means some production agents should be used to achieve some products. In this model in each production institution considering the size and amount of its agents of production is considered as a point in the multi-dimensional space that, dimensions of this space are determined by the number of production agents and the coordinates of spot and the amount that each of these agents are used. Then by choosing a production institution as a sample by assistance of the linear programming the situation of this production institution is determined, therefore we'll have an equal number of production institutions and linear programming relations. In this method we don't need a special producing function and therefore we won't estimate any parameter. This method evaluates the efficiency of one institution to the other institutions. In this calculation we assume that all of the institutions are on or above the iso-quant curve. In this method efficiency is measured by the ratio of the product to the production factors that can be generalized to some production agents and some products [2]. In general, the function of none parametric methods to measure the efficiency is founded in an essay by Farl [8] in 1957. He introduced merely a mathematical method to measure the modern efficiency against the parametric methods. Farl[8] for the first time introduced "Farl's efficient frontier" as a none-parametric frontier. According to the mathematical methods and distance of institution from frontier he could measure the efficient frontier. Farl's theories [8] became a foundation and beginning of discussions in the following years. Charnes et al., [13] at first introduced a model that was based on the inputs and the assumption of "constant return to scale" existed in it, which is the CCR model itself. Banker, et al., [20] in their other articles substituted some other flexible assumptions that introduced the "variable return to scale" (BCC) model. Farl's theories [8] caught the attention of not only mathematicians but also the management scholars and economists about none-parametric structures, so that instead of using production function and parametric methods to measure the efficiency.

Data Envelopment Analysis or DEA, studies about the outputs of each institution considering the used inputs in comparison with other institutions, in which results of the study are in two efficient and inefficient ways. If the investigated institution is inefficient in comparison with the other institutions, DEA model determines the virtual institution considering the source units (efficient units). In DEA method for each of the inefficient institutions, one or a mixture of some efficient institutions is introduced as the source institution that can be a real institution or in general a virtual institution that the inefficient institution can follow it. In this research the model for the output based CCR and BCC models was investigated and analyzed.

$$Max y_0 = \theta$$

st :

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq \theta y_{ro} \qquad (r = 1,2,...,S)$$

$$\sum_{j=1}^{n} \lambda_j x_j \leq x_{io} \qquad (i = 1,2,...,m)$$

$$(j = 1,2,...,n) \text{ Free in mark } \theta \ \lambda_j \geq 0$$

Model 1: the output based CCR model.

The aim of this model is to achieve the maximum output. In this model $\Theta \geq 1$ and $\frac{1}{\theta}$ shows the amount of efficiency.

$$Max Z = \theta$$

st :

$$\sum_{j=1}^{n} \lambda_j x_{ij} \leq x_{io} \qquad (i = 1,2,...,m)$$

$$\sum_{j=1}^{n} \lambda_j y_{rj} \geq \theta y_{ro} \qquad (r = 1,2,...,S)$$

$$\sum_{j=1}^{n} \lambda_j = 1 \qquad (j = 1,2,...,n)$$

$$\theta \text{ Free in mark } \lambda_j \geq 0$$

Model 2: the output based BCC model

The aim of this model is to maximize Θ to achieve the highest output level.

Type and number of inputs and outputs affect the efficiency. Therefore, choosing the inputs and outputs of the model must be done very carefully. Charnes et al., [13] in building the DEA method about the number of measured units and the number of inputs and outputs have reached a practical relationship that comes in the following:

Equation (1 – 1): (number of outputs + number of inputs) 3≤ number of investigated institutions that if we don't observe the above rule, a large number of institutions go on the efficient frontier and have efficiency grade of one [5].

In CCR model we said that this model investigates the constant return to scale, but the constant return to scale in many production organizations and institutions is not reliable and therefore the necessity to introduce a model with variable return to scale (BCC) was felt to have a better view of the problems [19]. Banker et al., [20] by adding the salience condition to the sum of CCR model's conditions inserted the variable return to scale.

In general models of DEA are divided into two groups of "input based" and "output based". In output based models we think that by keeping the amount of inputs fixed (efficiency formula is the fractions outlet) and maximizing the amount of outputs and in input based model wewant to minimize the amount ofinputs to produce a fixed number of outputs[21]. Considering the following figure, when we investigate the input based model, we move from point D to point R but when we investigate the output model in order to reach the efficient frontier we have to move from point D to point S.

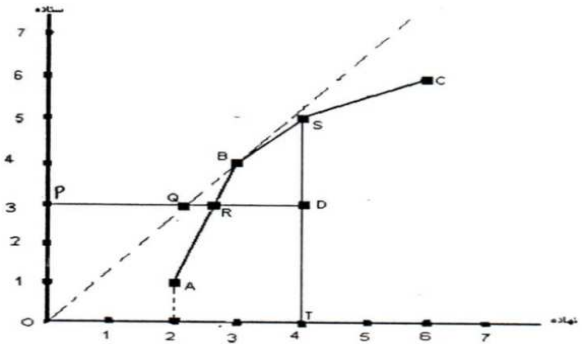

Figure 1. diagrammed comparison of CCR and BCC models.

Figure 1 show the efficient frontier in BCC and CCR models. CCR's efficient frontier is shown by the hyphenated line that starts from the origin of coordinate and passes from point B. But the frontiers of BCC model are bold lines that connect A, B. S and C points together. Production facility is an area that consist this frontier together with the existing or possible points under it. The A, B.C and C units are on these frontiers and all of these four units are efficient in BCC, while among the above mentioned units only B is efficient in CCR.

Considering the efficient frontier in both of the models the efficiency of D is less than B'S. Therefore, in general the efficiency in CCR is never more than BCC's efficiency. Considering the figure we can find out that if there is one efficient DMU in CCR, it must be efficient in BCC either and the opposite is not possible. In this research considering the productive aspect with two inputs of the number of employees and the average of personnel costs and two outputs of the amount of given loans and the amount of money for four consequent periods of six months from April 2012 to November 2013 was estimated for the output based model. These data are taken from the monthly published statistics of Sepah Bank in West Azarbaijan province. It should be noted that the estimation of a model to evaluate the efficiency of Sepah Bank branches in West Azarbaijan province is accomplished by DEAP1.2 software.

In table one we have five columns that the first column is Sepah Bank branches. The second, third and fourth columns respectively show the constant return to scale (CRS), variable return to scale (VRS) and scale efficiency that is called economic or management efficiency and finally the fifth column shows the type of return to scale that IRS is increasing return to scale and DRS is decreasing return to scale and the hyphened line shows the constant return to scale. In DRS part if we add a unit of (π) the amount products will increase less than (π) times and here we suggest using less agents. In the conditions of IRS if we add a unit of (π) to the data, the amount of products will increase more than (π) times and in this case we suggest using more agents. And in constant return to scale, by increasing the inputs to amount of (π) the outputs will increase to the amount of (π).

Table 1. Efficiency model for the case of two inputs and two outputs in output based model.

	crs	vrs	scal		Firm		crs	vrs	scal	
Karkhaneh ghand Myandoab	0/869	1/000	0/869	irs	28	Emamat Oromyeh	0/222	0/268	0/827	irs
Tekab	0/383	0/421	0/910	irs	29	Ghyam Oromyeh	0/376	0/393	0/957	irs
Azadi bokan	0/333	0/360	0/926	irs	30	Shohada Oromyeh	0/348	0/376	0/926	irs
Askar khan Oromyeh	0/355	0/384	0/926	irs	31	Meydan Khoy	0/373	0/381	0/977	irs
Rajaye Bukan	0/262	0/288	0/908	irs	32	Moshtagh Oromyeh	0/549	0/621	0/885	irs
Oromyeh	1/000	1/000	1/000	-	33	Oshnawyeh	0/295	0/326	0/905	irs
Motahhari Oromyeh	0/362	0/391	0/926	irs	34	Mahabad	0/321	0/714	0/450	drs
Mako	0/459	0/572	0/802	drs	35	Poldasht	0/303	0/382	0/792	irs
Emam Hosein Oromyeh	0/289	0/326	0/885	irs	36	Khoy	0/394	0/880	0/448	drs
Tarebar Oromyeh	0/718	0/769	0/934	irs	37	Dastgkeyb Oromyeh	0/124	0/150	0/827	irs
Shahidmadani Oromyeh	0/655	0/686	0/955	irs	38	Esteghlal Mahabad	0/408	0/440	0/926	irs
Chaldoran	0/355	0/483	0/735	irs	39	Amini Oromyeh	0/450	0/486	0/926	irs
Bukan	0/332	0/467	0/711	drs	40	17Shahriwar Oromyeh	0/480	0/524	0/915	irs
Shot	0/473	0/582	0/814	irs	41	Daneshkadeh Oromyeh	1/000	1/000	1/000	-
Keshawarz Salmas	0/361	0/412	0/876	irs	42	Sardasht	0/421	0/436	0/967	irs
Motahhari Khoy	0/370	0/426	0/868	irs	43	Rajayi Oromyeh	0/233	0/252	0/926	irs
Gharaziyaddin	0/407	0/425	0/957	irs	44	Piranshahr	0/389	0/427	0/910	irs
Khoshkbar Khoy	0/309	0/325	0/952	irs	45	Kashani Oromy	0/466	0/501	0/930	irs
Salmas	0/437	0/534	0/817	drs	46	Emamzadeh Khoy	0/391	0/429	0/912	irs
Farhangyan Oromyeh	0/438	0/458	0/957	irs	47	Waliasr Oromyeh	0/327	0/396	0/827	irs
Myandoab	0/566	0/774	0/731	drs	48	Padegan Oromyeh	0/596	1/000	0/596	irs
Bazar Oromyeh	0/573	0/599	0/957	irs	49	Modarres Oromyeh	0/429	0/448	0/957	irs
Shahindezh	0/325	0/339	0/958	drs	50	Khayyam Oromyeh	0/381	0/445	0/855	irs
Moallem Salmas	0/349	0/384	0/908	irs	51	Naghadeh	0/475	0/556	0/854	drs
Kordestan Bukan	0/331	0/357	0/926	irs	52	Homafar Oromyeh	0/447	0/540	0/827	irs
Rodaki Oromyeh	0/234	0/284	0/827	irs	53	Besat Oromyeh	0/244	0/281	0/870	irs
Bolwar Mako	0/534	0/577	0/926	irs		Mean	0/425	0/496	0/871	

In table 1, two branches of 6 (Orumiah) and 41 (DaneshkadehOrumiah) are in the range of CRS and only seven branches of 8 (Makoo), 13 (Central Bokan), 19 (Central Salmas), 21 (Miandoab), 23 (Shahindej), 34 (Central Mahabad) and 51 (Naghadeh) are in the range of decreasing return to scale and other branches are in the range of IRS. In the conditions of constant return to scale (CCR), branches 6(Orumiah), 41 (DaneshkadehOrumiah) are efficient and the inefficient branches are 37 (DastgheibOrumiah), 28 (EmamatOrumiah), 43 (RajaeeOrumiah) and 26 (RudakiOrumiah). The efficient branches in the conditions of variable return to scale are, 1 (Sugar Factory Miandoab), 6 (Central Orumiah), 41 (DaneshkadehOrumiah), 48 (PadeganOrumiah). And inefficient branches are, 37 (DastgheibOrumiah), 43 (RajaeeOrumiah), 28 (EmamatOrumiah) and 26 (RudakiOrumiah). In table 2, the model branches are chosen for the inefficient branches at first, and then in table 3, the percentage that inefficient branches should follow the model branches to reach efficiency is shown.

Table2. The model branches for inefficient branches

firm	Peers:			firm	Peers:			firm	Peers:		
1	1			19	6	41		37	41	48	
2	41	48	1	20	41	48		38	41	48	
3	41	48		21	41	6		39	41	48	
4	41	48		22	41	48		40	41	6	1
5	41	1	48	23	41	6		41	41		
6	6			24	48	41	1	42	41	6	1
7	41	48		25	41	48		43	41	48	
8	41	6		26	41	48		44	41	48	1
9	41	48		27	41	48		45	41	6	1
10	4	6	1	28	41	48		46	41	1	48
11	48	41	1	29	41	48		47	41	48	
12	6	48	1	30	41	48		48	48		
13	41	6		31	41	48	1	49	41	48	
14	1	6	48	32	41	48		50	41	1	48
15	48	41	1	33	41	6	1	51	41	6	
16	41	1	48	34	6			52	41	48	
17	41	6	1	35	6	48	1	53	48	41	1
18	48	41	1	36	6						

Table 3. The percentage that inefficient branches should follow the model branches.

peer weights:			Firm	peer weights:			Firm	peer weights:		
1.000			20	0.714	0.286		39	0.571		0.429
0.386	0.182	0.432	21	0.583	0.417		40	0.238	0.003	0.759
0.571	0.429		22	0.714	0.286		41	1.000		
0.571	0.429		23	0.917	0.083		42	0.579	0.043	0.378
0.421	0.351	0.228	24	0.323	0.492	0.184	43	0.571		0.429
1.000			25	0.571	0.429		44	0.376	0.168	0.457
0.571	0.429		26	0.286	0.714		45	0.023	0.182	0.796
0.583	0.417		27	0.571	0.429		46	0.338	0.545	0.117
0.429	0.571		28	0.286	0.714		47	0.286		0.714
0.267	0.058	0.675	29	0.714	0.286		48	1.000		
0.273	0.705	0.022	30	0.571	0.429		49	0.714		0.286
0.075	0.733	0.192	31	0.777	0.036	0.187	50	0.273	0.364	0.363
0.583	0.417		32	0.429	0.571		51	0.750		0.250
0.412	0.093	0.495	33	0.117	0.033	0.850	52	0.286		0.714
0.528	0.396	0.076	34			1.000	53	0.494	0.370	0.136
0.022	0.949	0.029	35	0.129	0.687	0.184				
0.435	0.079	0.486	36			1.000				
0.251	0.688	0.061	37	0.286	0.714					
0.417	0.583		38	0.571	0.429					

In table 2 we can see the model branches for inefficient branches and table 3 branches to reach efficiency. For example, branch 3 should follow branch 41 to %571 and follow branch 48 to %429 to reach the efficiency frontier.

Analyzing the Mamquist index (productivity Index):

Efficiency is an important element in studying and investigating the function of institutions during time. In evaluating the efficiency we used the malmquist index. Malmquist index makes the separation of productivity feasible by its two general elements that are technological and technical productivity changes. To achieve the total productivity we can use two following relations.

Technological efficiency changes × technical efficiency changes = total productivity changes.

Management efficiency × scale efficiency × technological efficiency = total productivity changes.

As we already said, Malmquist productivity index diagram is divided into two indexes:

1- Measuring the efficiency changes (EC)

2- Measuring technological efficiency changes (TEC)

The size of technological changes is shown as the curve changes of the same amounts of inputs and outputs.

Malmquist productivity index considering the distance function, production agents asEi^{t+1}, technical efficiency changes as Ti^{t+1}, technological changes in the conditions of transforming the frontier functions are measured between two periods of t and t+1, and x is inputs, and y is outputs.

$$M(X_s, X_t, y_s, y_t) = \frac{d^s(X_s, y_s)}{d^t(X_t, y_t)} \times \left[\frac{d^t(X_s, y_s)}{d^t(X_s, y_s)} \times \frac{d^t(X_t, y_t)}{d^s(X_t, y_t)} \right]^{1/2}$$

$M_0^{t+1}(y^{t+1}, x^{t+1}, y^t, x^t) = EC * TEC$

$$TC = \left[\frac{d^t(X_s, y_s)}{d^t(X_s, y_s)} \times \frac{d^t(X_t, y_t)}{d^s(X_t, y_t)} \right]^{1/2}$$

$$EC = \frac{d^s(X_s, y_s)}{d^t(X_t, y_t)}$$

That M is the Malmquist index; EC and TC are technical and technological efficiencies respectively.
If Malmquist index on the basis of minimizing the production agents is less than one, shows improvements in performance and if it is more than one shows decrease in performance. On the other hand, if the amount of Malmquist index on the basis of maximizing the product with each of these elements is less than one, shows the bad conditions of institution's performance and if it is bigger than one shows improvements in performance of the institution [2].

Table4: the productivity index for Sepah Bank in Iran is measured

firm	effch	techch	pech	sech	tfpch	firm	effch	techch	pech	sech	tfpch
1	1/048	0/971	1/000	1/048	1/018	28	1/127	0/963	1/097	1/027	1/086
2	1/116	0/954	1/085	1/029	1/065	29	1/003	0/961	0/994	1/010	0/964
3	1/122	0/963	1/096	1/023	1/080	30	0/991	0/963	0/969	1/023	0/954
4	1/081	0/963	1/056	1/023	1/041	31	1/004	0/958	1/003	1/001	0/962
5	1/135	0/954	1/103	1/030	1/084	32	1/045	0/963	1/003	1/042	1/006
6	0/814	0/837	1/000	0/814	0/681	33	1/031	0/960	1/016	1/015	0/990
7	1/003	0/963	0/980	1/023	0/966	34	1/038	0/955	1/050	0/988	0/991
8	0/991	0/973	1/112	0/891	0/965	35	1/040	0/908	0/963	1/081	0/945
9	1/156	0/963	1/110	1/042	1/114	36	1/014	0/963	1/043	0/972	0/976
10	1/031	0/966	1/020	1/011	0/996	37	0/995	0/963	0/968	1/027	0/958
11	1/020	0/960	1/010	1/010	0/980	38	1/037	0/963	1/013	1/023	0/999
12	1/045	0/913	1/012	1/033	0/954	39	0/988	0/963	0/966	1/023	0/952
13	1/116	0/958	1/118	0/998	1/069	40	1/014	0/967	0/987	1/027	0/981
14	1/171	0/894	1/093	1/071	1/047	41	0/992	0/960	1/000	0/992	0/952
15	1/099	0/960	1/051	1/045	1/055	42	0/982	0/972	0/978	1/004	0/955
16	1/032	0/978	0/984	1/048	1/009	43	1/062	0/963	1/038	1/023	1/023
17	1/049	0/961	1/081	0/970	1/008	44	1/097	0/955	1/066	1/029	1/047
18	1/006	0/957	0/995	1/011	0/963	45	1/088	0/873	1/111	0/980	0/950
19	0/998	0/970	1/126	0/886	0/968	46	1/034	0/969	1/006	1/028	1/002
20	1/039	0/963	1/029	1/010	1/001	47	1/060	0/963	1/032	1/027	1/021
21	1/001	0/958	1/019	0/983	0/960	48	0/929	0/963	1/000	0/929	0/895
22	0/990	0/963	0/981	1/010	0/954	49	0/864	0/964	0/856	1/010	0/833
23	1/032	0/957	1/053	0/980	0/987	50	0/907	0/967	0/861	1/054	0/876
24	0/997	0/964	0/968	1/030	0/961	51	0/920	0/973	1/005	0/915	0/896
25	1/075	0/963	1/051	1/023	1/036	52	0/865	0/963	0/842	1/027	0/833
26	1/024	0/963	0/997	1/027	0/986	53	1/174	0/970	1/121	1/048	1/139
27	1/023	0/964	1/000	1/023	0/985	**man**	1/026	0/956	1/019	1/007	0/980

The first column shows the names of branches that we already showed in table 1, the second column shows technical efficiency changes, the third column is about technological changes, the fourth column shows efficiency changes in and finally the sixth column shows the total efficiency changes.

Since productivity is measured on the basis of the output based model, those branches that their productivity is more than one, show their improvement in total performance. And also the branches that their total productivity is less than one show their decrease in total performance. Results show that in four periods only 20 branches have had increase in performance that com respectively in the following:

53 (BesatOrumiah), 9 (Emamhosin square Orumiah), 28 (EmamatOrumiah), 5 (RajaeiBokan), 3 (Azadi square Bokan), 13 (Central Bokan), 2 (Tekab), 15 (KeshavarziSalmas), 44(Piranshahr), 14 (Shoot), 4 (AskarkhanOrumiah), 25 (Kurdistan Bokan), 43 (ShahidrajaeiOrumiah), 47 (ValiasrOrumiah), 1(karkhaneghandmyandoab), 16 (MotahariKhoy), 17 (Qaraziadin), 32 (MoshtaqOrumiah), 46 (EmamzadehKhoy), 20 (Shahrakfarhangian Orumiah).

RESULTS AND DISCUSSION

Although software companies have an important role in performance's measurement, but the problem with most of these software packages today, is that they provide only a massive amount of data. Although in 1980s the problem with performance measuring systems was their being one dimensional and measurement considering the inefficient and not suitable information, but the problem today is measuring a lot of subjects that all of these quantities bother managers and most of organizations are caught in trap of "measuring multi indexes".

An effective method to encounter multi indexes and estimate efficiency is "Data Envelopment Analysis" that although it has some limitations but still is a capable, standard and clear methodology that lets managers to measure and analyze lots of inputs and outputs with a different scale simultaneously.

Table 5. we can show efficient and inefficient branches of the province in two models of CCR and RCC.

	CCR	BCC
Efficient Branches	Oromyeh, Daneshkadeh Oromyeh	Karkhane Ghand Myandoab, Oromyeh, Daneshkadeh Oromyeh,PadeganOromyeh
In efficient Branches	Dastgheyb Oromyeh, EmamatOromyeh	Rajayi Oromyeh, Rodak iOromyeh

Considering table 1 average of efficiency in all branches of the province in conditions of constant return to scale (CCR) is %425 that to reach the efficient frontier of Sepah Bank in province must increase %575 to its outputs and in variable return to scale (BCC) the average of efficiency in all branches of the province is %496 that to reach the efficient frontier of Sepah Bank in province must increase %504 to its outputs.

Table 6: results of efficiency average using Malmquist index for all branches of the province.

	Technical efficiency	Technological efficiency	Management efficiency	Scale efficiency	total productivity
Branchs total average	1.026	%956	1.019	1.007	%980

Using table 6 we can conclude that branches of Sepah Bank in West Azarbaijan province technically show improvement in performance and technological efficiency indicates decrease in performance of branches. Productivity of management has shown improvement in performance and total productivity of all the branches shows decrease in total performance of branches that indicates the performance average of all branches in the province has decreased during the four periods. Considering results of the model we saw a lot of inefficiencies in branches of West Azarbaijan province and we need to re-plan and provide sources and effective ways to attract more money and give more facilities and we also suggest that reward and over time working of branches be paid according to their efficiency. Considering decrease in performance average of all the branches of Sepah Bank in province during four periods of investigation that is all because of technological inefficiency, we suggest that Sepah Bank in West Azarbaijan province increase using electronical services like POSs and improve internet services and mobile banks and also increase ATM services that in this case we can achieve the same outputs with less inputs or even with less inputs achieve more outputs that finally will increase efficiency and productivity in all branches of Sepah Bank in West Azarbaijan province.

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