DETERMINING EFFICIENCY AND RANKINGS BANK BRANCHES OF MELLI IRAN USING METHOD OF DATA ENVELOPMENT ANALYSIS (DEA)  
(CASE STUDY WEST AREA OF RASHT)

Reza Aghajan Nashtaei  
Department of Business Management, Islamic Azad University, Rasht Branch, Rasht, Iran  
Mohammad Tajaddodi Paskiabi  
M.A. of Business Management, Islamic Azad University, Rasht Branch, Rasht, Iran  
(Corresponding Author)

Abstract  
In this paper discussed to evaluate the efficiency and causes of inefficiency bank branches of melli Iran in west area of Rasht Using method of Data Envelopment Analysis. Finally, rankings them using this method. For this reason we examined 17 branch were active under the supervision of this area and in 2012 using method of DEA and CCR model in two mode Input and Output by DEA-solver software. The results obtained show that only 3 branch from the 17 branch were efficient and the rest were inefficient. Based on this branches were ranked and suggestions presented for educing inefficient of branches and reach them to maximum efficiency by modeled from branches of reference.

Keywords : Bank Branches, Efficiency, Method of Data Envelopment Analysis

Introduction  
Banks as one of the major financial institutions are responsible important role in the economy that are including equipping deposits, intermediation, and easing payment flow and allocation of credits. In less developed countries and economies in transition that do not have developed financial markets, generally, banks are the only institutions that were capable of financial intermediaries and also they can be presented in different ways of credit help to reduce risk investments. (Basar 2006)  
In our country banks can also play an important role, because additionally intermediaries of being in the money market due to inadequate development of capital market plans have major role in the financing and long-term economic plans. Due to the raising standards of financial and the importance of commercial and specialized banks in country will be necessary using strict criteria for evaluate the performance of banks. (Khataei & Yousefi 2007)  
Banking is activities that has significant role in the beginning and continuation of production and service and also it has a major impact on economic growth. Hence if in the domain of banking be adopted appropriate monetary policy and along it the various banks to fulfill their activities as optimal, the aims can create significant change in national economy. (Pour Kazemi 2007)

Previous Research  
1. A research was performed by Sherman and Gold in 1985. They reviewed 14 branch of savings banks in America and concluded among the 14 branches only 6 branches have
100% efficiency. Causes of inefficiency was factors such as poor management, branch size, number of employees and operating costs. (Kord Et al. 2011)

2. Smild & Matheos in 2012 by efficiency analyzing of multi-directional from efficiency patterns in the Chinese banks during 1997 to 2008 have indicated differences between efficiency among different subgroups accordance with set of be investigated data by MEA. Especially attention to case from joint stock banks and state-owned banks in China have been investigated through experimental tests that are there differences efficiency models of these two types of banks? Or only are different at efficiency levels. (Bahiraei & Hamedi 2012)

3. A research was performed by Borhani in 1998 about 32 commercial banks in Iran for the period 1993-1995. This research deals to investigated allocative efficiency (cost efficiency) of commercial banks in Iran. Results showed the average of efficiency for commercial banks in Iran is equal to %73. (Borhani 1998)

4. Alizadeh Sane (1999) in research deals to evaluation of 119 branches of Saderat Bank using the 4 assumption (Returns of constant, variable, increasingly and decreasing to scale). Results have shown that average efficiency of constant return to scale is 0.74 and variable return to scale is 0.89. (Alizadeh Sane 1999)

**Efficiency**

Efficiency is one of the most important evaluation indexes of optimum performance for economic units. Firms is efficient from combined certain data achieved maximum output. Using this approach can be separated efficiency to two part of internal efficiency (Private Efficiency) and external efficiency (Social Efficiency). Internal efficiency is related to firm actions optimize assuming institutional constraints imposed on firms. External efficiency is related to optimize the effects of firm activities in the economy. (Amiri & Raies Safari 2006)

The simplest and broadest definition of efficiency provided by Peter F Drucker. He says: Efficiency is doing right works. Therefore Efficiency is comparison between resources that we expect be consumption for achieving the goals, objectives and specific activities with resources will consumption in this way. (Afsharian Et al. 2011)

**Type of Efficiency**

**Technical Efficiency**

It is Ability of a unit to obtain the maximum output with a group of constant inputs. This efficiency is influenced by practices performance and its scale is unit or agent. Technical efficiency is difference between ratio of output to observed input or ratio of output to input in the best conditions. (Gulumser Et al. 2010)

**Allocative efficiency**

It is the ability a unit in optimum usage from inputs for production with regard to price and technology as cost be minimal. In this efficiency it is assumed that the organization in term of technically is efficient completely. (Nigmonov 2010)

**Economic Efficiency**

It is combination from technical and allocation efficiency. Its mean technical efficiency is represents the maximum of possible production levels for a production firm using certain inputs,
and also allocation efficiency. With regard to factors and products, cost and level of certain and constant from technology show amount of inputs utilization in optimum size. (Chen 2010)

**Scale Efficiency**
It is reflect ratio current efficiency of unit to efficiency in optimal scale its manufacturing unit. In fact, scale efficiency is represents the optimal scale production of production unit. (Falah 2007)

**Data Envelopment Analysis (DEA)**
Cause of the widespread acceptance of this method than other methods is existence of examine the complex relationships and often unknown between multiple outputs. DEA has provided a new attitude to activities that already have been assess by other methods. Using this method decision making units are divided to both efficient and inefficient. Determine the efficiency is performed using DEA model based on distance of every decision making unit from efficiency frontier and the type being its image on frontier.

![Figure 1: Data Envelopment Analysis Model](Fiorentino Et al. 2006)

**Research Data (Inputs - Outputs)**
**Concepts of Input and Output**
The selection of inputs and outputs in the efficiency analysis is discussion of basic and structural of analytical. In the case of financial firms such as banks and insurance institutions is more important. Because in this firm, separation intermediate goods and services can't be done to input and output simply and there will be goods and services have both characteristics. In general, production and industrial units the input is defined as resources such as labor, capital and building so that in creating a product will be need to them. The input increase production costs. The output is defined as goods and services that had applicant and consumers are willing to its purchase and its sell be income for firms. Outputs are often intangible and therefore its measurement and control is not possible easily. (Falah 2007)
Inputs
Costs ($X_1$): This input is obtained from composition of deferred claims costs and doubtful receivable.
Number of Employees ($X_2$): This input is entered to model of deterministic DEA as the number of people.

Outputs
Deposits ($Y_1$): This output is obtained from combination of three factors: Long-term Investment Deposits, Savings Deposits, and Current Deposits of Government, Corporate and Entities.
Facilities ($Y_2$): This output is included all granted facilities by branches.
Number of Banking Services ($Y_3$): In this study, most services is taken into consideration like ratio credits provided.

Research Methodology
In this study for data analysis was used DEA-SOLVER software and data using CCR model of input based and output based. Selected branches were ranked respectively efficiency and were presented strategies for improving efficiency of inefficient branches and how their reach to level of efficient branches. DEA model defines how implement efficiency of measure units for inefficient units. These models are special method for researchers that are interested to multi-output efficiency in contrast several data. There are two general direction in DEA: Focus on inputs in the model of based input and also focus on outputs in the model of based output. (Muhammad 2008)
CCR model after determining the efficient frontier curve defines decision maker units are where this boundary and to achieve efficient frontier should be chosen what combination of inputs and outputs. It is not possible unless by determine of the input and output coefficients for each unit. In DEA models with input views we are seeking to obtain technical inefficiency extent that should be reduced in inputs as output does not change and unit placed in efficient frontier. (Kord Et al. 2011)

Conclusions
The Results of the Models of CCR-Input, CCR-Output and Branches Rankings Using DEA Technique
According to the obtained averages from results inefficiency of the branches determined in two cases CCR-Input and CCR-Output and were rankings.

Rankings Efficient and Inefficient Units
Based on branches rankings that was performed in 2012 branches score and rank obtained through their average monthly in year. Accordingly branches be rankings annually. The results obtained are as follows:

Efficient Units in 2012 by CCR Model of Based Input
1. Unit 14
2. Unit 1
3. Unit 12

Inefficient Units in 2012 by CCR Model of Based Input with Average Yearly to the Most Inefficient
1. Unit 10 , %12.36
2. Unit 4 , %17.95
3. Unit 9 , %19.92
4. Unit 5 , %24.74
5. Unit 13 , %25.88
6. Unit 6 , %26.24
7. Unit 15 , %26.55
8. Unit 7, %26.86
9. Unit 16, %28.24
10. Unit 11, %31.50
11. Unit 3, %35.15
12. Unit 2, %35.98
13. Unit 8, %43.88
14. Unit 17, %57.48

**Efficient Units in 2012 by CCR Model of Based Output**
1. Unit 14
2. Unit 1
3. Unit 12

**Inefficient Units in 2012 by CCR Model of Based Output with Average Yearly to the Most Inefficient**
1. Unit 10, %18.43
2. Unit 5, %16.03
3. Unit 6, %28.81
4. Unit 9, %32.20
5. Unit 13, %36.09
6. Unit 15, %45.19
7. Unit 4, %49.25
8. Unit 16, %52.28
9. Unit 3, %53
10. Unit 7, %55.72
11. Unit 2, %61.95
12. Unit 11, %75.75
13. Unit 17, %107.41
14. Unit 8, %160.86

**Suggestions of Research**
1. Use of efficient branches as reference for increase the efficiency of inefficient branches and reviews and compare weaknesses Inefficient branches with reference branches to improve their situation.
2. Reducing the cost of branches to be prepared for platform for increased facilities grant and also increase income of branches.
3. Optimal use of existing human resources and their reduced size of values obtained by DEA.
4. More effective use of existing fixed assets and increase long-term investment deposits, savings deposits, and current deposits of government, corporate and entities.
5. Increased facilities granted that of course depends on the increase in deposits and receipt overdue receivables and suspected of branches.
6. Decentralization of funds in some specific Branches
7. Causes reviews to lack of deposits in some branches and eliminate the shortcomings relating to it.
8. Causes reviews to reduction granted facilities of some branches and increase in receipt overdue receivables.
9. Causes reviews to sharp decline in the number of banking services in some branches.

**References**
1. Afsharian-Kryvko-Reichling, Mohsen-Anna-Peter, 2011. Efficiency and Its Impact on the Performance of European Commercial Banks, Faculty of Economics and Management,
2. Alizadeh Sane. 1999. Reviews impact on the effectiveness returns to scale
5. Basar, Mehmet- A. Banu. 2006. ASSESSMENT OF TURKISH BANKS’ PERFORMANCE BY USING DATA ENVELOPMENT ANALYSIS, Advancing Business and Management in Knowledge-based Society
7. Chen, Tien-Hui. 2010. Using Data Envelopment Analysis (DEA) to the efficiency evaluation and improvement of a Taiwanese commercial bank, Department of Tourism Management
15. Pour Kazemi, Mohammad Hosein. 2007. Ratings of banks branches