

MEASURING AND PREDICTING THE PERFORMANCE OF AGRICULTURE BANK USING DEA TECHNIQUE IN GUILAN-IRAN

Mohammad Rasool Sayadi

M.A. Student of Industrial Engineering, Islamic Azad University, Bandar e Anzali International Branch, Bandar e Anzali, Iran

Shahram Gilaninia

Associate Professor, Department of Industrial Management, Islamic Azad University, Rasht Branch, Rasht, Iran (Corresponding Author)

Abstract

The purpose of this study is to measure and predict the performance of Agriculture Bank using DEA techniques. Research method in term of purpose is applied and in term of implementation is mathematical analytical method. Data Collection is done using documents in the database of bank. In this study, DEA model is used to evaluate the performance of banks. In this study, decision units evaluated is included 15 main branch of Agriculture Bank in Guilan province. According to the results and comparisons of different branches using model of CCR-I , branches of Rasht, Fuman, Langrud, Anzali, Astara, Talesh, Rezvanshahr, Siahkal, Masal were efficient but Kuchesfahan, Rudsar, Sowme'eh Sara, Rudbar, Astaneh, Lahijan were inefficient. According to an analysis conducted by the DEA, ranking of branches is obtained as follows: Rasht, Fuman, Langrud, Anzali, Astara, Talesh, Rezvanshahr, Siahkal, Rudsar, Rudbar, Kuchesfahan, Sowme'eh Sara, Astara and Lahijan.

Keywords: Performance Measurement, DEA, Agriculture Bank

1. Introduction

In the current competitive conditions and alarmed, businesses have greater tendency to act wisely and reinforce flexibility and agility in order to enhance productivity and competitiveness. Trying to performance-wise requires a coherent system to assess organizational performance. The importance of performance measurement is caused that organizations spend time, energy and considerable human and financial resources to evaluate their performance in analytical levels of people, organizational units, processes and entire organization in order to achieve the mission and goals (Mohammadi Ghanataghsetani & et al, 2015). The banking sector is an important part of every country's economy that proper management and logical is led to proper implementation of monetary policy and increase social welfare (Gilaninia & et al, 2013). Banks do their activities at the community level through physical branches; therefore, proper management and logical expressed should also be considered at the level of bank branches. Banks do grading to check and manage their branch branches. According to their structural policies have different classifications such as the top branches, grade one, two, three, etc (Yousefi & et al, 2014).

Data Envelopment Analysis method¹ has always been considered researchers as one of the ways to assess the performance of the units (Azar & Noobahar, 2015). DEA is one of the most widely used methods to measure the efficiency of organizations. It is nonparametric classic techniques and based on mathematical programming that is used for comparing the efficiency evaluation of a set of similar decision-making units (Siriopoulos & Tziogkidis, 2010).

2. Statement of Problem

The problem of performance measurement has prompted researchers and users to challenge many years. In all ages people is looking for better use of the resources available, and all their talents have used to attract and mobilize these resources (Gilaninia & et al, 2011a). Performance assessment as one of most essential control functions subsidiaries is considered one of the four elements of organization and management in organizations that measure current situation so it can be used as a basis for decisions about continuing, modify or stop doing something. Performance assessment in terms of how to use resources can be expressed in the form of efficiency indicators (Taleghani & et al, 2013). In fact, the performance evaluation system will measure the efficiency of management decisions about optimum use of resources and facilities (Taheri & Yahyatabar, 2011). The world in the 21st century is a world full of competition, market development, the emergence and spread of technology and the expansion of trade that efficient utilization of opportunities, possibilities and limited resources to meet the challenges ahead is the condition of success in this arena(Gilaninia & et al, 2011b; Dizgah & et al, 2011b). The pressures of globalization and the rapid growth of non-bank financial and credit institutions in recent years, is caused that banks to survive and thrive by creating research centers and research activities and ongoing assessment and restructuring of branch performance act in order to improve their performance in domestic and foreign markets (Safaei Ghdikalaie, 2011). Banks are financial institutions that collect assets from various sources and give them to parts that need liquidity. Hence, banks are considered the lifeblood of any country. Banks to surpass each other in order to increase market share and profitability are looking for a variety of performance improvements methods to attract customers (Moetameni & et al, 2010). The banking system as one of the most important economic sectors of society are responsible for effective roles in relation to recruiting and guided depositors, offering services to the public and participation in economic, social and cultural and the inability of this system will create many problems in developing countries. Banks among the various industries as well as have particular importance because they through loans, facilitating and participating in various economic projects can prepared the conditions for investment and thereby be effective in the growth and development of economic. Evaluating the performance of banks has special significance due to crucial role of banks in most economic activities (Golbazzkhonipour & et al, 2013). Given the importance of issue, different methods is used for performance measurement such data envelopment analysis (DEA), hierarchical process (AHP), gray relationship analysis (GRA), Balanced Scorecard (BSC) and analysis of financial statements (FAS) (mahmoudi, 2011). DEA is used in this study. Data envelopment analysis is a mathematical programming techniques to measure the relative efficiency of organizational units that has similar duties and uses multiple input for the production of multiple output (Mohammadi & Mohammad Hosseini, 2007). Thus question of research is as follow:
Is use of DEA method effective to better assess performance of Agriculture Bank branches in Guilan?

¹ DEA

3. Research Methodology

Research process comprises three successive steps. First step is to identify functional input and output of branches of Agriculture Bank. Mathematical models to measure the efficiency of bank branches were designed in second step and this was done in the framework of data envelopment analysis. In the third step, rankings of bank branches were determined using the results of bank branches efficiency. All of these steps and techniques used in each step are illustrated in Figure 1.

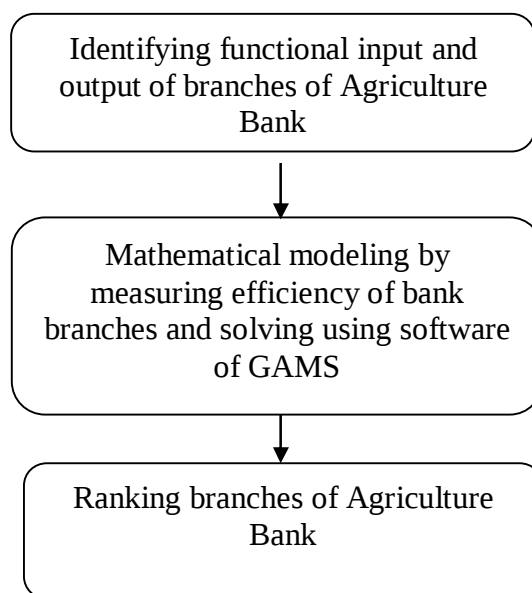


Figure 1. The steps of research

Research method in term of purpose is applied and in term of implementation is mathematical analytical method. Data collection is done using documents in the database of bank. This study has used DEA model by assuming returns to scale of fixed and variable. Thus, model of CCR standard is selected for this purpose. Statistical population of study is consisted of 15 main branches of Agriculture Bank in province of Guilan.

4. Data Analysis



Figure 1) view of the multiple inputs and outputs of the research model

4.1. Calculating the efficiency of Agriculture bank branches

Efficiency of Agriculture bank branches in Guilan according to the method of input oriented CCR are presented as follows in Table 1:

Table 1: calculating the efficiency of Agriculture bank branches

Number of DMU	Branch Name (DMU)	Efficiency value	status of Branch Efficiency
1	Rasht	1	Efficient
2	Fuman	1	Efficient
3	Kuchesfahan	0.88	Inefficient
4	Rudsar	0.92	Inefficient
5	Langarud	1	Efficient
6	Anzali	1	Efficient
7	Sowme'eh Sara	0.84	Inefficient
8	Astara	1	Efficient
9	Talesh	1	Efficient
10	Rudbar	0.91	Inefficient
11	Astaneh	0.81	Inefficient
12	Rezvanshahr	1	Efficient
13	Siahkal	1	Efficient
14	Lahijan	0.67	Inefficient
15	Masal	1	Efficient

4.2. Introduction of template branches (reference) for inefficient units

This section will be introduced units of template and reference for inefficient branches of Guilan bank that are as follows in Table 2:

Table 2: Template branches for inefficient units

Number of DMU	Branch Name (DMU) of Inefficient	Number of Template DMU	name of Template branches
3	Kuchesfahan	1	Rasht
4	Rudsar	1	Rasht
7	Sowme'eh Sara	1	Rasht
10	Rudbar	1	Rasht
11	Astaneh	1	Rasht
14	Lahijan	2	Fuman

4.3. Ranking efficient branches based on the number being as reference unit

In this section in order to rank efficient units, number of introducing them as a unit of reference and template is the basis for ranking efficient branches of Agriculture Bank that is showed in Table 3:

Table 3: Rankings efficient branches

Number of DMU	Branch Name (DMU)	Number introduced as the template	Rank among efficient branches
1	Rasht	5	1
2	Fuman	1	2

4.4. Total Ranking bank branches based on efficiency value

This section will be determined ranking each one of branches. It is done according to their efficiency value in comparison with other branches of Agriculture Bank in Guilan province as below tables 4:

Table 4: Ranking branches of Agriculture Bank

Number of DMU	Branch Name (DMU)	Efficiency value	Ranking branch
1	Rasht	1	First
2	Fuman	1	First
5	Langarud	1	First
6	Anzali	1	First
8	Astara	1	First
9	Talesh	1	First
12	Rezvanshahr	1	First
13	Siahkal	1	First
15	Masal	1	First
4	Rudsar	0.91	Tenth
10	Rudbar	0.91	Eleventh
3	Kuchesfahan	0.88	Twelfth
7	Sowme'eh Sara	0.84	Thirteenth
11	Astaneh	0.80	Fourteenth
14	Lahijan	0.67	fifteenth

5. Conclusion and Recommendations

Measuring efficiency of different organizations and comparing efficiency among their units are issues that nowadays, is considered in the economy. For this reason, banks and financial institutions are the most important institutions of any economic system, thus, the measurement of bank branches efficiency is very important. In this study was attempted to use DEA approach to measure the performance of bank branches. In this study according to the results and comparisons of different branches using model of CCR-I, branches of Rasht, Fuman, Langrud, Anzali, Astara, Talesh, Rezvanshahr, Siahkal, Masal were efficient but Kuchesfahan, rudsar, Sowme'eh Sara, Rudbar, Astaneh, Lahijan were inefficient. According to an analysis conducted by the DEA, ranking of branches is as follows: Rasht, Fuman, Langrud, Anzali, Astara, Talesh, Rezvanshahr, Siahkal, Rudsar, Rudbar, Kuchesfahan, Sowme'eh Sara, Astara and Lahijan. Thus, the following recommendations will be presented according to the results of the study:

Inefficient units to enhance their deposits should be do suitable marketing and advertising for their services.

Inefficient units to enhance their effectiveness must increase the number of important services so that they can attract customers of natural and legal.

Banks can close their own to border of relative efficiency using efficient banking experience including the use of personnel trained, committed and courteous, better training of personnel, proper use of management practices, customer-orientation and true respect for clients, diversification of banking services and updated use of information technology and technologies related to banking industry.

Banks by investing more in human resources and their training and use of motivational programs, they will be happy, motivated and participatory. Because skilled and creative people question the status quo for process improvements and improved processes will enhanced service to customers and ultimately existence of loyal and satisfied customers will lead to improve performance and efficiency of organization.

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