

Technical Efficiency Analysis of Participation Banks that Operated Between 2005 and 2013 in Turkey

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Abstract— With this study, the technical efficiencies of Participation Banks Association which are active in Turkey is examined on. To do this, we benefited from Data Envelopment Analysis which facilitates to examine different input-output components and which is a non-parametric method. As inputs; total assets the funds collected, number of staff and profit share expense and as outputs the funds disbursed and profit share income are used. As a consequence of this study, it's stated that in 2005 and 2006, a table is designed for potential rehabilitation.

Keywords— Islamic Finance, Participation Banks Association, Efficiency, Technical Efficiency, Data Envelopment Analysis

I. INTRODUCTION

Islamic financial institutions aim to provide funds in order to enable and facilitate trade by conforming to principles established by Islam. Accordingly, apart from traditional financial institutions they have a religious aspect and concern [1]. Although the main reason is interest, numerous other reasons have had impacts on the emergence of Islamic financial institutions. Especially, reasons such as Islamic countries' having vast oil reserves in the Middle East, desire of individuals who comprise the Islamic society to utilize their savings, Islamic government managers' becoming more conscious, problems to find funding for huge investment projects are among factors that have affected the emergence of these institutions [2].

“Participation Banks”, as renamed since 2005, known as “Islamic Banking” in the world and “private financial institutions” in Turkey as, named, which are based on profit and loss sharing are the basic part of the Islamic financial system. In traditional banking, deposits collected from depositors with predetermined interest rates are made available for ones who are in need of funding as credit in return for interest rates determined by banks.

Participation Banks are institutions which provide funding for production and trade activities or carry out these activities themselves directly and share profits and losses of these activities with their clients [3].

II. HISTORICAL DEVELOPMENT OF PARTICIPATION BANKING

A. Development of Participation Banking in the World

First efforts towards unifying modern financial services and the principles of Islam started in Egypt between 1963 and 1967. First applications in Egypt were mostly based on model of the saving banks that operated in rural areas of Germany. These saving banks neither paid interest to depositors nor charged interest for clients whom they granted loans. Interest free banking, which had already existed in theory was put into practice with the foundation of the Nasser Social Bank in Egypt in 1971 [4].

In 1973, ministers of finance from members of Islamic Conference Organization agreed upon foundation of a bank that would grant loans in order to promote economic and social development of member countries in full compliance with Islamic principles. The Islamic Development Bank that started to operate in accordance with this agreement gets some amount of commission while granting loans and additionally provides funding based on profit and loss sharing. Moreover, the Islamic Development Bank support transactions such as purchasing shares of capital in investment projects, leasing and etc. and projects suitable for the target of promoting economic development of member states [4].

Middle East Countries' utilizing their oil deposits and founding their own interest free banking model was an important turning point in development of interest free banking system. Interest free banking model that has spread all over the world and become available gradually has taken its place in world banking sector [5].

B. Development of Participation Banking in Turkey

Participation banks' activating idle resources that stayed away from banking system and the economy due to interest sensitivity, efforts towards diversifying financial products and institutions in 1980's led to that Turkey met with participation banks in 1985 [3].

Establishment of private financial institutions was permitted with a cabinet decision with number of 83/7507 issued in 1983 (Tunç, 2010). At first, Albaraka Turk and Faysal Finans started operating in 1985 and were followed by Kuveyt Turk in 1989, Anadolu Finans in 1991, Ihlas Finans in 1995 and Asya Finans in 1996. Then Faysal Finans was renamed as Family Finans. Family Finans merged with Anadolu Finans in 2005 and has still continued its operations under Türkiye Finans [6].

With the banking law with number of 5411, adopted on 19 October 2005, "private financial institution" inscription was changed to "participation bank". Moreover some of the changes made were that Participation Banks would be subject to Banking Law, they would be subject to the supervision of the Banking Regulation and Supervision Agency, their current and participation accounts would be taken under the guarantee of the Savings Deposit Insurance Fund Board. With the law, participation banks took its part in banking system in Turkey, as well. Turkish banking system are evaluated under 3 categories which are respectively commercial banks, development and investment banks and participation banks [7].

III. LITERATURE REVIEW

Doğan [8] compared financial performances of participation banks and traditional commercial banks based on the period between 2005 and 2011. In the study, profitability, liquidity, riskiness, solvency and capital adequacy ratio were used. According to results of the study, deposit banks were identified to have higher liquidities, solvencies and capital adequacy ratios and lower riskiness compared to participation banks and any statistically meaningful difference between profitabilities of participation banks and traditional banks was not detected.

Küçükaksoy and Önal [9] measured the efficiencies of 10 privately owned deposit banks and 5 foreign deposit banks that operated between 2004 and 2011 in Turkey. In the study, based on DEA method, variable return to scale measurement was made by using 3 input and 2 output variables with "Win4deap" packet software. According to results, Akbank, a privately owned deposit bank, and of foreign deposit banks, Arap Türk Bankası Inc. was detected to be efficient in variable returns to scale efficiency.

Yayar ve Baykara [10] measured the efficiency and productivity of 4 participation banks that operated between 2005 and 2011 in Turkey with the help of TOPSIS (Technique for Order Preference by Similarity to An Ideal Solution). According to results of the study, that Asya Katılım Bankası which had the highest score in productivity took other rankings in terms of efficiency score caused to the view that efficiency and productivity notions were distinct notions. Moreover after sukuk, one of the interest free banking instruments had been introduced, Kuveyt Türk participation bank's efficiency and productivity increased remarkably.

Dağ [11] measured the efficiencies of participation banks with input oriented DEA under the assumption of variable returns to scale and The Malmquist Total Factor Productivity Index and compared with privately owned deposit banks, which were their rivals. In the study, 21 privately owned deposit banks and 4 participation banks were chosen as decision making units based on the period between 2006 and 2009. Results showed that by years, participation banks were not as efficient as privately owned deposit banks under the assumption of variable returns to scale. Additionally, comparing total factor productivity indexes of participation with ones of deposit banks, participation banks were observed to have better scores and be more efficient.

IV. DATA ENVELOPMENT ANALYSIS - DEA

Data envelopment analysis was developed by Charnes, Cooper and Rhodes in 1978 [12]. Hospitals, education institutions, production, site selection, benchmarking, fast food restaurants, wholesale stores, banking, armed forces, space researches, sport can be given as examples of its areas of application [13] [14]

DEA is a mathematical programming based method that is used in measuring relative efficiencies of organizational units with multiple inputs/ outputs which do similar tasks. Especially in cases in which multiple inputs or outputs cannot be converted to weighted input or output set, DEA is accepted as an efficient approach [15]. Efficiency is measured through the radial distance (can be defined as geometrical distance of a point to the origin) to efficient frontier [16]. DEA that compares production units which are assumed to be homogenous with each other accepts efficiency frontier as the best observation. Other observations are evaluated in reference to this most efficient observation. DEA provides improvement choices in case of inefficient decision making units [17]. This is quite important: DEA's efficiency frontier emerges as a realized observation more than an assumed situation [18].

According to Karsak ve İşcan [19], the most important innovation of DEA is its enabling measurements without requiring any prediction of predetermined presence of any analytical production function in environments in which multiple outputs are obtained from multiple inputs [20]. However all inputs and outputs should be non-negative and non-zero [21].

V. INPUT ORIENTED CCR MODEL AND LINEAR PROGRAMMING FORMULATION

CCR model was initially introduced by Chames, Cooper and Rhodes in 1978. CCR model can be implemented both input and output oriented. Assume that there are b numbers of decision such as DMU1, DMU2... DMU b . Some common input and output items for each of these b DMUs are determined as follows:

Numerical data are obtained for each of the input and output items and these data are positive for all DMUs.

Selection of input, output items and DMUs, should be made in a way that they should reflect the analyst's interest and they should establish a cluster which will affect relative productivity.

Units of the different inputs and outputs need not to be congruent. Units may differ in terms of number of personnel, amount of money spent, surface area and etc.

In order to determine relative productivity of each DMU j within a sample cluster which is established by input and output data of b DMU, b optimization models should be solved.

VI. IMPLEMENTATION

Comparative measurements of DEA models and decision making units that have the same inputs and outputs could be made. Model is solved for each of the decision making unit. One of the results obtained from DEA models is relative efficiency value for each unit. As a result of linear programming, if the objective function is equal to 1 (or 100%) it is considered "efficient-productive". If the objective functions of the DMUs are not equal to 1 (or 100%) these DMUs should be made similar to efficient DMUs. In this way, inefficient ones are rendered efficient.

With the assumption of that making changes in inputs are easier in practice, relative efficiency of participation banking between 2005- 2013 has been measured by using input oriented DEA method which is a productivity measurement method. Input variables determined to conduct efficiency measurement were as follows: total assets, funds deposited, number of personnel and profit share expenses; output variables were funds made available and profit share incomes. Input oriented DEA model. General efficiency view of the sector in the period between 2005 and 2013 is given in Table 1 according to input oriented DEA results.

TABLE I
EFFICIENCY SCORES

Decision Making Units (Years)	Efficiency Scores	Benchmarking (Reference Set)
2005	93,5%	2008 (0,325) 2010 (0,021)
2006	94,9%	2007 (0,659) 2010 (0,001) 2012 (0,002)
2007	100%	1
2008	100%	1
2009	100%	0
2010	100%	2
2011	100%	0
2012	100%	1
2013	100%	0

Potential improvement tables can be established as in Table-2 according to years which refer to decision making units in inefficient years 2005 and 2006.

According to the analysis result, for the sector in order to achieve 100% efficiency in 2005; total assets and profit share expenses should be cut by 6,48%, expenses of deposited funds should be cut by 17% and number of personnel should be decreased by 32,99%; profit share incomes should be increased by 5,36%.

When 2006, the last inefficient year was investigated for the sector; it was detected that the sector should cut the following variables: total assets and profit share expenses by 5.08%, deposited funds by 10.94% and number of personnel by 14.09%.

TABLE II
POTENTIAL IMPROVEMENT TABLES

	Factors	Realized	Objective	Potential Improvements (%)	
2005	Output	Total Assets	9945291	9300649.409	-6,48
		Funds Deposited	8392698	6965290.890	-17,00
		Number of personnel	5757	3858	-32,99
		Profit share expenses	589050	550868.500	-6,48
	Input	Funds made available	7071171	7071171	0,00
		Profit share incomes	1004046	1057817.878	5,36
2006	Input	Total Assets	13729720	13032000.324	-5,08
		Funds Deposited	11237284	10008400.514	-10,94
		Number of personnel	7112	6110	-14,09
		Profit share expenses	797759	757218.322	-5,08
	Output	Funds made available	9836329	9836329	0,00
		Profit share incomes	1500363	1500363	0,00

VII. CONCLUSION

Intense competition and globalization require sectors and companies in sectors to operate most efficiently and force them to determine which factors they should take into consideration. Participation banking has started to develop with an increase in both its size of assets and deposited funds in recent years. In this study, it was aimed to identify the general status of the sector by taking general data of 4 participation banks into consideration and measuring the efficiencies of these banks between 2005 and 2013 with the help data envelopment analysis. According to the results of the analysis, the banks were detected not to operate efficiently and their potential improvement tables were created. Examining these tables, some indicators that were determined to be cut on average were as following: ratio of size of assets by 5.78 % , ratio of deposited funds by 13,97%, ratio of number of personnel by 23,54% and profit sharing expenditures by 5,78%. In case these cuts were done, it was observed that increases especially in accounting profits and in technical profits as well would occur. Participation banks have contributed variety and depth to the sector. Political and economic instability was the main reason that participation banking could not reach to desired level in terms of volume or size until 2005.

Considering developments in the world, global instabilities emerged in 2005. Surpluses in Asia and partly Europe despite increasing budget deficits of the USA were at the base of this instability [22]. Especially global instabilities and increase in the level of indebtedness were observed as a result of fluctuation in May 2006. It is thought that the result of negative impacts of these developments have reflected on the result of the analysis.

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