



Efficiency of Participation and Conventional Banks: Evidence from Turkey

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Abstract: Measuring efficiency is a critical stage for decision making processes. Although previous studies show many aspects of Islamic banks that outperform conventional banks, this research investigates the most current evidence from banking sector. The purpose of the present study is to measure the efficiency of participation banks and conventional banks in Turkey. Data Envelopment Analysis (DEA) is used as a tool to measure the efficiency of sample data for the period from 2015 to 2018 on the annual basis. Results indicated that participation banks show better performance than those of conventional banks in terms of efficiency.

Keywords: Islamic banks, Conventional banks, Efficiency, Data envelopment analysis

JEL Classifications: G1, G2, G3

1. Introduction

Studies on the Islamic financial system are categorized under two main subjects. First category reviews the studies that focus on the macroeconomic viability of Islamic finance and the relationships between the Islamic finance and macroeconomic indicators. The second category emphasizes the studies that compare Islamic banks and Islamic finance to its conventional counterparts.

In the early literature, Islamic finance's macroeconomic viability is intensely criticized. As a financial system that takes its roots from not an economic theory but from religious texts, a significant portion of early studies view Islamic finance as more of a political tool than an actual financial system (Henry & Wilson, 2004; Lodhi & Kalim, 2005). In western markets, equity banking was already a phenomenon that took the place of Islamic finance even before the invention of Islamic finance as a marketing term for religiously sensitive clients. While legally still a conventional bank, banks that invested mainly in equity were considered equity banks. Equity banks operated in a way that is very similar to that of Islamic banks. Identical to Islamic banking, equity banks do not deal in debt financing which is strictly forbidden in Quran. However, two main factors in equity banking is not in compliance with the Islamic sharia law (Ariff, 1988). First and main problem is that the equity banks invest in corporations or institutions that generate interest revenues, such as conventional banks. Additionally, equity banks also invest in companies that deal in alcohol business or swine meat production businesses. In sharia, investing in such businesses is strictly forbidden (Hassan & Lewis, 2009). A second violation of Islamic principles by equity banks is that they do not share profit and loss in the way that sharia law commands. In this context equity banks were the choice of banks that were preferred by religiously sensitive investors.



The primary objective of the present paper is to measure the efficiency of participation banks and conventional banks in Turkey. The paper gives an extensive review on performance on Islamic finance in general and Islamic banking in particular. As a research method, Data Envelopment Analysis which becomes a standard tool to analyse the efficiency is used for the period between 2015 and 2018 on annual basis. Research findings are evaluated with respect to the previous researches.

2. Literature Review

Differentiating its orientation from an equity banking centered point of view was critical for Islamic banking. This became even clearer, as the value lost due to the funds that are kept out of the financial system due to the religious concerns got bigger over time (Iqbal, 1997). During this period, petrodollars played a significant role in the advancement of Islamic finance. With the motivation of integration these funds into the financial system, both Muslim and western countries advertised participations banks with the promises of regulations in accordance with the sharia (Mansoor Khan & Ishaq Bhatti, 2008).

Reviewed studies are categorized under three categories based on their finding regarding the economic effects of the Islamic finance. A substantial majority of studies in the literature reach to the conclusion that either indirectly imply or directly state that, the addition of Islamic finance into the financial system benefits the economy.

Table 1. Review of Studies that Focus on the Macroeconomic Viability of the Islamic Finance

Author (date)	Country	Contribution	Detrimental	Mixed
(Abduh & Azmi Omar, 2012)	Indonesia	X		
(Abdalla Ahmed, 2008)	Sudan	X		
(Ajili & Bouri, 2018)	5 Countries	X		
(Ashraf, 2013)	Saudi Arabia	X		
(Bayram, Abdullah, & Meera, 2018)	Turkey, Malaysia, KSA, Pakistan	X		
(Gudarzi Farahani & Dastan, 2013)	9 Countries	X		
(Hoepner, Rammal, & Rezec, 2011)	20 Countries	X		
(Jawadi, Jawadi, & Louhichi, 2014)	Europe, The USA, World	X		
(Walkshäusl & Lobe, 2012)	35 Countries	X		
(Sufian, Mohamad, & Muhamed-Zulhibri, 2008)	MENA	X		
(Makni, Benouda, & Delhoumi, 2016)	IEF Performances		X	
(Marzuki & Worthington, 2017)	Malaysia		X	
(Abdel Megeid, 2017)	Egypt		X	
(El-Masry, de Mingo-López, Matallín-Sáez, & Tortosa-Ausina, 2016)	MENA		X	
(Chaffai & Medhioub, 2018)	GCC		X	



Author (date)	Country	Contribution	Detrimental	Mixed
(Salih, Ghecham, & Al Barghouthi, 2018)	GCC		X	
(Djennas, 2016)	8 Countries			X
(Boudt, Raza, & Wauters, 2017)	S&P500 Sharia Compliant			X
(Al-Nasser Mohammed & Jorih Muhammed, 2017)	IISB			X

The economic value added by the Islamic banks in terms of macroeconomic indicators is discussed in depth in the literature. The most prominent benefit on Islamic banks in the literature is their ability to increase aggregate savings by introducing deposits into the financial system that would otherwise be kept out of the financial system. A more arguably discussed benefit of the Islamic financial system is that its equity-centered financing. Several studies in the literature find evidence that the existence of Islamic finance decreases the vulnerability of financial system against crises by increasing equity funding (Abduh & Azmi Omar, 2012; Ajili & Bouri, 2018; Ashraf, 2013; Djennas, 2016). When it comes to stock market volatility, some studies found evidence that Islamic financing reduces the volatility in the stock market environment (Al-Nasser Mohammed & Jorih Muhammed, 2017; Boudt et al., 2017).

The main opposition against Islamic finance in the literature is the ambiguity in the set of laws accepted between different sharia boards, countries or even banks. The lack of a proper regulation in a considerable amount of countries, expose the financial sector to various manipulations. Another significant opposition in this subject is about the capability of Islamic finance to effectively use the funds it gathers. In this regard, the majority of the studies that perceive the existence of Islamic finance as a detrimental factor in an economy, suggest that, the Islamic finance institutions are sub-optimally utilizing their funds (Abdel Megeid, 2017; Chaffai & Medhioub, 2018; Marzuki & Worthington, 2017). Additionally, some studies suggest that, in countries where Islamic finance has a dominant role in financial system, economy growth may be stumped due to the restricted or limited use of the debt leverage (Al-Nasser Mohammed & Jorih Muhammed, 2017; Salih et al., 2018).

There is extensive literature on the comparison between the conventional banks and Islamic or participation banks. While the literature is rich and numerous, the main bulk of the studies are focused on the Islamic country markets. In addition to this clustering, almost the entire literature is built upon the studies of Muslim scholars and academicians. In light of this information, it would be safe to assume that the literature might be subjected to confirmation bias, as almost the entire literature is built on studies suggesting that the Islamic banks outperform the conventional banks.

Table 2. Review of Studies that Compare the Islamic Finance and Conventional Finance

Author (date)	Country	Outperformance	Underperformance	Mixed
(Zarrouk, Ben Jedidia, & Moualhi, 2016)	MENA	X		
(Chazi & Syed, 2010)	Mixed	X		
(Abdullah, Hassan, & Mohamad, 2007)	Malaysia	X		



Author (date)	Country	Outperformance	Underperformance	Mixed
(Baber, 2018)	N/A(Systematic Review)	X		
(Doumpos, Hasan, & Pasiouras, 2017)	Asia, GCC, MENA	X		
(Akram & Rahman, 2018)	Pakistan	X		
(Alam, Arshad, & Rizvi, 2016)	Islamic Indices	X		
(Miah & Sharmeen, 2015)	Bangladesh		X	
(Abdul-Wahab & Haron, 2017)	Qatar		X	
(Abbas, Hammad, Elshahat, & Azid, 2015)	Pakistan		X	
(Daly & Frikha, 2017)	Bahrain			X
(Erol, F. Baklaci, Aydoğan, & Tunç, 2014)	Turkey			X
(Chowdhury, Haque, & Masih, 2017)	GCC			X
(Mobarek & Kalonov, 2014)	OIC			X
(Mokni & Rachdi, 2014)	MENA			X
(Shawtari, Saiti, Shaikh Abdul Razak, & Abdul Kareem, 2017)	Yemen			X
(Abid, Goaid, & Ammar, 2018)	GCC			X
(Abbas, Azid, & Hj Besar, 2016)	Pakistan			X

Studies that support the absolute outperformance of conventional banks by Islamic banks are numerous. A contributing factor to this finding is suspected to be the recent entrance of Islamic banks into the market. Due to their comparably smaller assets of values, in terms of growth in size or change in profits the figures of Islamic banks stand out. This may result in misleading results in the short run, until both firm sizes equalize to a comparable level.

Some studies outright suggest that Islamic banks are more profitable and more efficient in almost every way compared to conventional banks (Akram & Rahman, 2018; Baber, 2018; Chazi & Syed, 2010). These studies generally suggest that the fixed income debt instruments offered by the conventional banks require a complex process of hedging to neutralize their risk. This complex hedging process is generally very costly in terms of both managerial and financial costs. Another group of similar studies suggest that stock market performance of Islamic banks are significantly better than the performance of conventional banks due to the willingness of people to participate in a interest-free way (Abbas et al., 2016; Abid et al., 2018; Zarrouk et al., 2016).

The few studies that reach to the results in favor of the conventional banks, are mainly the studies that criticize a lack of regulative system or the studies that point out to the misinterpretation of sharia laws in Islamic financial system of the domestic country (Abbas et al., 2015; Abdul-Wahab & Haron, 2017; Miah & Sharmeen, 2015). Accordingly, all of these studies are based on a single country and their results are not generalizable.



3. Research Methodology

3.1. Data

Data Envelopment Analysis was applied to the data of 22 banks between the years of 2015 and 2018. In the study, data of the deposit and participation banks operating in Turkey are used. Their effectiveness is found in two different ways, under the assumptions of variable return on scale (BCC) and fixed return on scale (CCR). The use of two different scales will increase the reliability of the results and provide an opportunity for comparison. The input and output data used to find efficiency in the study are given in the table below.

Table 3. Input and Output Data

Input	Output
Deposit (Collected Funds) Total Assets	Loans and Receivables Total Assets
Interest Expenses (Profit Shares Expenses) Total Assets	Interest Income (Profit Shares Income) Total Assets
Number of Employees	

The banks used in the study to find out the efficiencies are shown in Table 4.

Table 4. List of Banks

Deposit Banks		Participation Banks
Ziraat Bank	Türk Ekonomi Bank	Albaraka Türk
Halk Bank	Türkiye İş Bank	Kuveyt Türk
Vakıflar Bank	Yapı ve Kredi Bank	Türkiye Finans
Akbank	Citibank	Ziraat Katılım
Anadolubank	Denizbank	
Fibabanka	Deutsche Bank	
Şekerbank	HSBC Bank	
Turkish Bank	ICBC Turkey Bank	
Türkiye Garanti Bank	ING Bank	

3.2. Research Method

The CCR method is the first Data Envelopment Analysis method and is based on the assumption of constant returns to scale. According to Behdioğlu & Özcan (2009), if the effectiveness of the decision unit is h_j , the objective should be the maximization of this value. The mathematical equation is:



$$Enbh_j = \frac{\sum_{r=1}^n u_r y_r}{\sum_{i=1}^m v_i x_i} \quad (1.1)$$

In equation 1.1, u_r shows the weight of the output, y_r shows the amount of output, v_i shows the weight of the input; and x_i shows the amount of input. According to Behdioğlu & Özcan (2009), the mathematical equation of the BCC model is given below.

$$e_k = \min \theta - \varepsilon \left\{ \sum_{k=1}^m s_k^- + \sum_{i=1}^r s_i^- \right\} \quad (1.2)$$

$$\theta x_{ko} - \sum_{j=1}^n x_{kj} \lambda_j - s_k^- = 0, \quad k=1, \dots, m,$$

$$\sum_{j=1}^n y_{ij} \lambda_j - s_i^+ = y_{io}, \quad i=1, \dots, r, \quad (1.3)$$

$$\lambda_j, s_k^-, s_i^+ \geq 0,$$

In the equations 1.3 and 1.4; e_k shows additional activity, x_{kj} shows input used by j decision unit, x_{ko} used by decision unit, y_{ij} is output produced by j decision unit, y_{io} is output produced by decision unit, ε is small enough positive number, n number of decision units, p number of outputs, m is defined as the number of inputs, θ is the shrinkage value, which determines how much the relative efficiency of the decision unit can be measured, s_i^+ and s_i^- are the idle values of the input and output, λ_j is the density value taken by the j th decision unit (Behdioğlu & Özcan, 2009).

4. Research Findings

18 deposit and 4 participation banks are examined in this section according to CCR and BCC methods. Table 5 and 6 shows the results of the CCR model. According to the results of the CCR model, the minimum efficiency average in deposit banks was 62 percent in 2018 and the maximum was 69 percent in 2017. At most 5 deposit banks were efficient in one year. The minimum efficiency average in participation banks is 73 percent in 2018 and maximum in 2017 with 96 percent. Up to 2 deposit banks were efficient at most in one year.

Table 5. Deposit Banks CCR Model Findings

Deposit Banks	2015	2016	2017	2018
Ziraat Bank	0,38	0,52	0,80	0,80
Halk Bank	0,40	0,49	0,52	0,52
Vakıflar Bank	0,36	0,56	0,70	1
Akbank	0,33	0,32	0,28	0,25
Anadolubank	0,31	0,69	0,67	1



Deposit Banks	2015	2016	2017	2018
Fibabanka	0,92	1	1	1
Şekerbank	0,46	0,55	0,47	0,42
Turkish Bank	1	1	1	1
Türk Ekonomi Bank	0,52	0,63	0,83	0,49
Türkiye İş Bank	0,53	0,56	0,85	0,51
Yapı ve Kredi Bank	0,56	0,60	0,59	0,33
Citibank	0,97	0,90	0,07	0,22
Denizbank	0,88	0,44	0,29	0,40
Deutsche Bank	1	1	1	1
HSBC Bank	0,51	0,36	0,66	0,24
ICBC Turkey Bank	1	1	0,86	0,73
ING Bank	1	1	1	0,82
Türkiye Garanti Bank	0,83	0,79	0,87	0,40
Average Efficiency of Deposit Banks	0,66	0,68	0,69	0,62
Number of Efficient Banks	4	5	4	5

According to the efficiency results of the CCR model, Deutsche Bank and Turkish Bank were the banks that reached the highest level of efficiency in deposit banks.

Table 6. Participation Banks CCR Model Findings

Participation Banks	2015	2016	2017	2018
Albaraka Türk	0,57	0,51	0,94	0,40
Kuveyt Türk	0,69	0,51	1	0,52
Türkiye Finans	0,96	0,72	0,90	1
Ziraat Katılım	1	1	0,99	1
Average Efficiency of Participation Banks	0,81	0,69	0,96	0,73
Number of Efficient Banks	1	1	1	2

According to the results of the CCR model, Ziraat Katılım was the bank that reached the highest level of efficiency in participation banks.

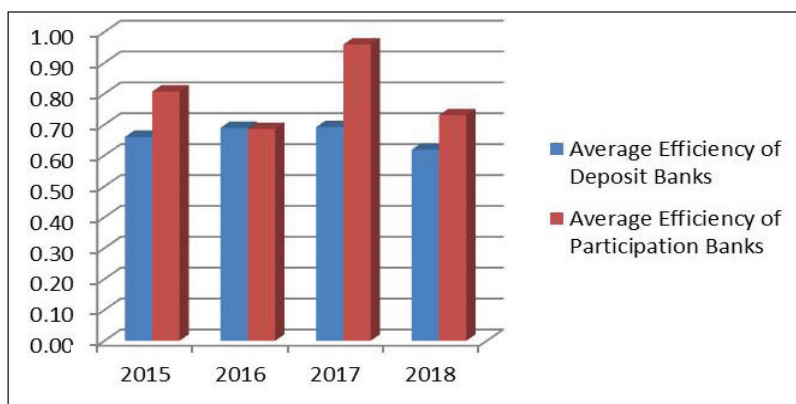


Figure 1: Comparison of Deposit and Participation Banks Under CCR Model

According to the average efficiency scores of the CCR model, participation banks are superior in all years except 2016. In addition, high volatility was observed in participation banks but not in deposit banks between the years.

Table 7 and 8 shows the results of the BCC model. According to the results of the BCC model, the minimum efficiency average in deposit banks was 76 percent in 2017 and the maximum was 81 percent in 2016. At most 9 deposit banks were efficient in 2015 and 2018. The minimum efficiency average in participation banks is 72 percent in 2016 and maximum in 2015 and 2018 with 85 percent. Up to 3 deposit banks were efficient at most in 2018.

Table 7. Participation Banks BCC Model Findings

Participation Banks	2015	2016	2017	2018
Albaraka Türk	0,57	0,52	0,95	0,41
Kuveyt Türk	0,81	0,61	1	1
Türkiye Finans	1	0,74	0,93	1
Ziraat Katılım	1	1	1	1
Average Efficiency of Participation Banks	0,85	0,72	0,97	0,85
Number of Efficient Banks	2	1	2	3

According to the results of the BCC model, Ziraat Katılım was the bank that reached the highest level of efficiency in participation banks.

Table 8. Deposit Banks BCC Model Findings

Deposit Banks	2015	2016	2017	2018
Ziraat Bank	0,49	0,70	0,81	1
Halk Bank	0,40	0,50	0,53	0,96

Deposit Banks	2015	2016	2017	2018
Vakıflar Bank	0,37	0,57	0,71	1
Akbank	0,35	0,33	0,30	0,27
Anadolubank	0,87	1	1	1
Fibabanka	1	1	1	1
Şekerbank	1	0,76	0,54	0,44
Turkish Bank	1	1	1	1
Türk Ekonomi Bank	1	1	1	0,55
Türkiye İş Bank	0,54	0,58	0,86	0,80
Yapı ve Kredi Bank	0,56	0,61	0,61	1
Citibank	1	1	0,28	0,27
Denizbank	1	0,73	0,30	0,40
Deutsche Bank	1	1	1	1
HSBC Bank	0,64	0,87	1	1
ICBC Turkey Bank	1	1	1	1
ING Bank	1	1	1	0,82
Türkiye Garanti Bank	0,89	0,84	0,88	0,40
Average Efficiency of Deposit Banks	0,78	0,81	0,76	0,77
Number of Efficient Banks	9	8	8	9

According to the efficiency results of the BCC model, Fibabanka, Deutsche Bank, Turkish Bank and ICBC Turkey Bank were the banks that reached the highest level of efficiency in deposit banks.

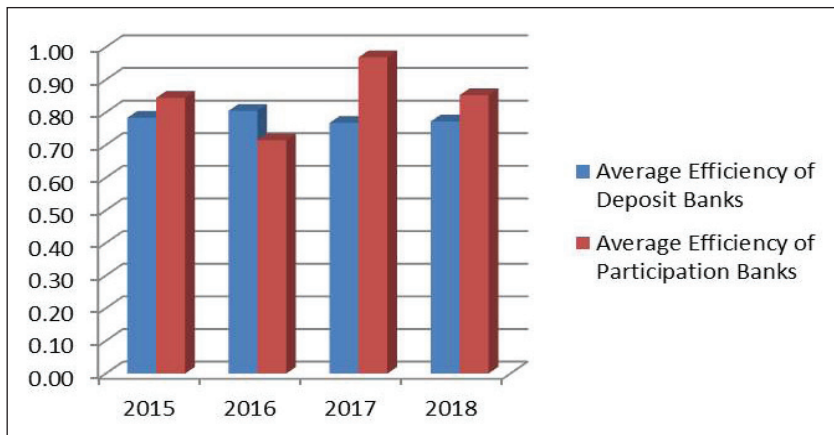


Figure 2: Comparison of Deposit and Participation Banks Under BCC Model



According to the average efficiency scores of the BCC model, participation banks are superior in all years except 2016. In addition, high volatility was observed in participation banks but not in deposit banks between the years. In the graphs examining average efficiency, the results showed parallelism in BCC and CCR models.

In addition, when only the number of employees is analyzed, it is seen in the below mentioned graph that deposit banks shrank and participation banks grew during the years.

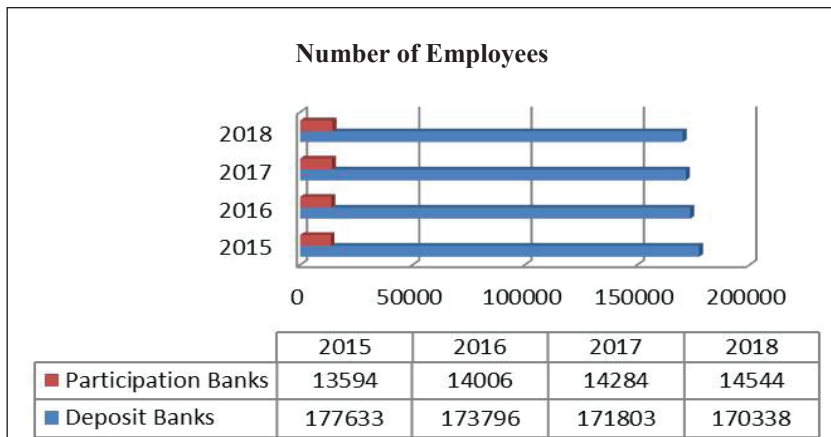


Figure 3: Number of Employees

There are few studies analysing Islamic banks efficiency by using Data Envelopment Analysis (Çelik & Ay, 2017). Rodoni, et.al. (2017), compared efficiency and productivity in Islamic banking for Indonesia, Malaysia and Pakistan and concluded that Islamic banks in Pakistan are more efficient than those of Indonesia and Malasia. Ramly & Hakim (2016), compare efficiency of Islamic banks and conventional banks in Indonesia and reported that there is no significant difference of efficiency between Islamic banking and conventional banking in 2014 which is contrast to the main findings in this research. It should be noted that we analysed four-year data for Turkish banks. Bahrini (2016) analyzed MENA Islamic banks during and after the global financial crisis and found that all the estimated efficiency scores were relatively stable during the crisis period (2007-2008) and in the two first years of the post-crisis period (2009-2010). Bayuny & Haron (2017) investigated the determinants of efficiency of Islamic banks in Indonesian and found that the efficiency scores of Islamic banks in Indonesia range from 61.4% to 96.4% between 2004-2014 with an overall efficiency of 75.6%. The efficiency of Islamic banks in Indonesia is negatively influenced by factors such as GDP growth, exchange rate and trade freedom while positively related with profitability, financing intensity, capitalization and non-financing expenses.

5. Conclusions

In this research, we compare the efficiency of Islamic banks and conventional banks in Turkey by using Data Envelopment Analysis. The results give a clear picture of better performance of participation banks in terms of efficiency. However, results should be examined with a caution that we applied one type of efficiency measure (DEA) and a certain number of variables (as input and output). In addition, due to availability of data, there is a four-year data analysis (2015-2018).



Although there are many studies that support the absolute outperformance of conventional banks by Islamic banks, a proper comparison can be made when there is the same size of Islamic banks within the sample. This rate is around 6% (participation banks penetration) in Turkish banking market. Due to their comparably smaller assets of values, in terms of growth in size or change in profits the figures of Islamic banks stand out. This may result in misleading results in the short run, until both firm sizes equalize to a comparable level.

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