

## The Comparative Efficiency Analysis Of Banks in Turkey

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### Extensive Summary

Studies that attempt to measure banks' efficiency can be classified into academic and business based researches. Academic researches use an empirical research setting for measuring efficiency. Business based researches, on the other hand, compare financial ratios of banks with industry average within a simplified setting. This study attempts to measure banks' efficiency by conducting data envelop analysis, one of the most frequently used techniques, on the data from 17 banks within the period of 2008-2016. Since there are three types of banks in Turkey (state, private and foreign banks), we conduct BCC (constant return to scale) and CCR (variable return to scale) as a tool for measuring efficiency. Using these two methods will increase the reliability of results.

The main purpose of the present study is to measure banks' efficiency in Turkey. In addition, we take banks' ownership structure into account for measuring efficiency by classifying banks into three categories with respect to their ownership structure as state, private and foreign banks. Results point out the managerial differences in the context of efficiency.

Data Envelop Analysis, which is used as a technique for measuring efficiency in this study, can be defined as the position of decision unit efficiency with respect to efficient frontier calculated by dividing sum of mathematically weighted inputs to sum of mathematically weighted outputs (Emir ve Özgür, 2008). We conduct BCC and CCR techniques for measuring the efficiency of state, private and foreign banks. Analysis consists of 17 banks with the period of 2008-2016. We use deposit, interest expense and

numbers of employee as an input and loan and interest income as an output. Analysis is conducted in R Programme which developed by Ihaka and Gentleman (1993).

The numbers of banks are distributed as 3 state banks, 7 private banks and 7 foreign banks in the analysis. Results are reported based on the techniques of BCC and CCR. According to result of CCR technique, average efficiency score of foreign banks ranges from 66 percent (2009) to 85 percent (2014). The number of efficient banks is found to be minimum 2 in 2009 and maximum 6 in 2014. Average efficiency score of private banks ranges from 65 percent (2009) to 92 percent (2016). The number of efficient banks is found to be minimum 0 in 2009 and maximum 4 in 2011. Average efficiency score of state banks ranges from 67 percent (2009) to 99 percent (2016). The number of efficient banks is found to be minimum 0 in 2009 and maximum 2 in 2010.

According to result of BCC technique, average efficiency score of foreign banks ranges from 82 percent (2011) to 99 percent (2014). The number of efficient banks is found to be minimum 3 in 2016 and maximum 7 in 2008. Average efficiency score of private banks ranges from 88 percent (2011) to 98 percent (2014). The number of efficient banks is found to be minimum 2 in 2009 and maximum 4 in 2014 and 2015. Average efficiency score of state banks ranges from 94 percent (2011) to 99 percent (2012). The number of efficient banks is found to be minimum 1 in 2011 and maximum 3 in 2010, 2013 and 2016.

The importance of scarce resources in globalized world has been attract more and more attention. In this regard, measuring efficiency becomes an important issue for business units in the economies. This study shows how to measure banks efficiency with representative inputs and outputs. In addition, we showed how to increase efficiency by manipulating the inputs for Deutsche Bank and Arab Turk Banks which are given as least efficient banks in the sample. Previous studies also show how to increase the efficiency by decreasing the number of employees and/or increasing loan capacity (Er ve Uysal, 2012).

It should be noted that this and similar studies may reflect efficient and inefficient banks with respect to representative inputs and outputs whereas the assumptions behind the methods used to measure efficiency should not be forgotten. Every method has its own assumptions. Therefore, we should underline the research constraints clearly. First of all, sample analysed in the paper does reflect heterogeneity among banks. As stated, there are three types of banks: state, private and foreign. Therefore, measuring efficiency with respect to sample based efficient frontiers in such a sample may not reflect the true threshold for all banks. In other words, these banks may have different input-output performance criteria. This might be case for state banks. This is possible due to their loan structure can be easily affected by political decisions. Due to the limited number of banks in the sample, we did not additional analyses conducted on these three subsamples.

Another important constraint here is that the number of inputs and outputs analysed. With the parallel to literature in banking studies, we selected three inputs and two outputs. However, there is a need to re-run the analysis by considering market based value outputs. In similar vein, in addition to data envelop analysis, some complementary performance analyses are needed to conduct for these variables. For example, how efficient and inefficient banks differ with respect to market based variables such as stock return.

Despite the fact that we cover the most recent dataset to analyse, the future studies may relax these constraints and come up with more comprehensive findings. These future attempts may shed light on the possible linkage between efficiency and performance.