

Does Ownership influence the Efficiency of Indian Banks? – An application of DEA

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Abstract: Due to globalization, more private and foreign sector banks started working on Indian soil. Due to the entry of these banks, the public sector banks received huge competition in their day-to-day activities. This study attempted to evaluate the impact of ownership of banks in India. The public and private sector banks were evaluated under homogeneous and heterogeneous environments. The results reveal that the heterogeneous environment (ownership) played a significant role in increasing the efficiency of banks. Due to the ownership, the public sector banks experienced more input losses as compared to private sector banks.

Index Terms: Data Envelopment Analysis, Ownership, Efficiency, Working environment

I. INTRODUCTION

The Indian banking system is broadly classified into three categories based on their ownership, namely, Public, Private and Foreign sector banks. The role of public sector banks is crucial because these banks mostly deal with people living in rural areas. The main objective of these banks is to channel the credit to the priority sectors and optimize the social benefits and also expand geographically to meet the growing needs of the people. The planning commission of India (NITI Aayog) quoted the public sector as, “*The public sector is expected to provide especially for the further development of industries of basic and strategic importance or in the nature of public utility services*”. From the pre-independence period, the public sector banks play an important role in the foundation of India in terms of creating job opportunities, a strong industry base, infrastructure creation, social welfare, and adding revenue to the government treasury, etc. In India, more than 70% of the public is working in government sector. According to the FY 2013-14 RBI bulletins, there are 75779 offices, and 801659 employees are working under public sector banks.

There are about 20 private banks are working in India. These banks are mostly working in urban areas. The main focus of these banks is to create more funds and channel the funds between the depositors and borrowers. These banks offer more exciting products to the customers for attracting the public. According to the FY 2013-14 RBI bulletins, there are 16001 offices, and 269941 employees are working under private sector banks. The capital ratio between public and private banks is 68:32 percent and the ratio of the deposit is 81:19 percent. More than 80% of the deposits are under public sector banks. This figure shows that public sector banks are crucial in the Indian economy. There is huge competition among the public and private sector banks in terms of ownership. The private sector banks are working effectively with minimum manpower and resources compared to public sector banks. Due to the competitive environment, the banks are offering innovative products to attract customers and strengthen their banking business. To promote their products these banks offered exciting schemes and finally some of the banks were committed to a risky environment. The public and private sector banks were working in a heterogeneous environment whose management policies and importance to urban and rural areas are extremely different among the managements. Past literature has shown that most of the researchers assumed a homogeneous environment to measure the efficiency of banks (T. Subramanyam et.al, 2008, 2020). The efficiency of a particular bank is relevant if we evaluate the bank’s efficiency in its real working environment. This study attempted to test whether the ownership of banks affects their performance using Data envelopment analysis models.

II. EFFICIENCY OF BANKS

Performance evaluation of banks is important for bank management and policymakers. To know whether a

bank is performing better as compared to other banks under homogeneous or heterogeneous conditions, one needs to model a commercial bank from a mathematical perspective. DEA is a nonparametric method used to measure the efficiency of organizational units where multiple input and output variables make comparison difficult. The main advantage of the DEA is the number of input and output variables are predefined. In the case of banking, there is no general agreement on the selection of input and output variables. A number of researchers proposed models to identify the significant input and output variables (Subramanyam, T, 2006; Subramanyam T, et.al, 2020). The present study aimed to measure the efficiency of Indian public and private sector banks during the financial years 2008-2013. Based on the availability of the data from the RBI Bulletins, the data were collected and identified the Number of employees, operating expenses as the input variables and deposits, interest income, and other income as output variables.

III. INTRODUCTION TO DEA MODELS

Charnes et.al (1978) proposed a linear programming problem to measure the efficiency of decision making units (DMU) under a homogeneous environment where similar inputs are employed to produce similar outputs. Suppose, we have n decision making units, where each DMU_j, (j = 1,2, ..., n) produces s-outputs, v_{rj}, (r = 1,2, ..., s), using 'm' inputs, say, u_{ij} (i = 1,2, ..., m). The DEA model to capture the efficiency of overall efficiency of any DMU, denoted by DMU₀ is

$$\lambda^{CCR} = \text{Min} \left\{ \theta: \sum_{j=1}^n \theta_j u_{ij} \leq \theta u_{i0}; \sum_{j=1}^n \theta_j v_{rj} \geq v_{r0}; \theta_j \geq 0 \right\}$$

In general, the constant returns to scale environment may not exist for any organization. To capture the scale differences of the DMUs, Banker et.al (1984) proposed a DEA model under variable returns to scale. The DEA model to capture the efficiency under variable returns to scale of a DMU, denoted by DMU₀ is

$$\lambda^{BCC} = \text{Min} \left\{ \theta: \sum_{j=1}^n \theta_j u_{ij} \leq \theta u_{i0}; \sum_{j=1}^n \theta_j v_{rj} \geq v_{r0}; \sum_{j=1}^n \theta_j = 1, \theta_j \geq 0 \right\}$$

IV. EMPIRICAL ANALYSIS

The present study aimed to evaluate the efficiency of public and private sector banks operating in India. The data consist of 26 public sector banks and 20 private sector banks in India during the financial year 2008-2013. The share of the public sector banks is more than 80% and the capital is only 68%. While coming to private sector banks 17% of the offices are owned by the private sector banks and 32% of the capital is under these banks. The deposits ratio between public and private sector banks is 80:20. It shows the importance of the public sector banks in the growth of the country's economy.

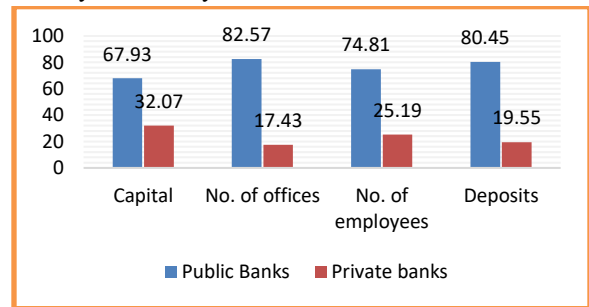


Fig1: Public-Private Sector Banks Assets

The public and private sector bank's efficiency was evaluated during the five financial years from 2008-2013. The average efficiency of these banks in different working environments (homogeneous and heterogeneous) is evaluated. To test whether ownership has a significant effect on the efficiency evaluation of public and private banks, we framed the following null hypothesis:

H₀: The ownership has no impact on the efficiency scores of public and private banks

The average efficiency scores of public and private banks were compared under homogeneous and heterogeneous environments separately using an

independent sample t-test. The significance values were compared at a 5 percent level of significance. The public sector banks' efficiency values are affected more as compared to private sector banks due to the ownership.

Table: t-test for equality of means (p-values)

Year	Public Banks	Private Banks
2008-09	0.012*	0.115 ^{NS}
2009-10	0.008*	0.023*
2010-11	0.013*	0.404 ^{NS}
2011-12	0.009*	0.208 ^{NS}
2012-13	0.001*	0.973 ^{NS}

*indicates significant and NS: Not significant.

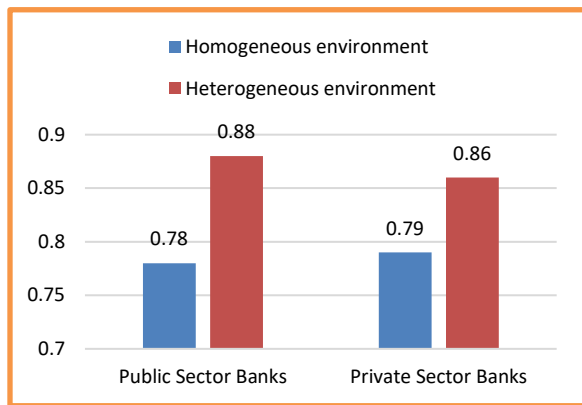


Fig2: Average Efficiency Comparison

The efficiency of public and private sector banks under homogeneous (Common frontier) and heterogeneous (separate frontier) environments were evaluated. Due to the ownership, both public and private sector banks experienced an average of 9% efficiency loss. Overall the public sector banks were performing better in heterogeneous environment.

V. CONCLUSIONS

This study attempts to test whether the working environment of public and private sector banks has a significant effect during the efficiency evaluation. 26 public and 20 private sector banks were considered for this study. This study evaluated the efficiency of these banks during the financial years FY 2008-2013. The public and private sector banks experienced almost the same change in their efficiency evaluation under homogeneous and heterogeneous environments. But, the performance of public sector banks is statistically significant ($p < 0.05$). The private sector banks are significant only at one year out of five years. It shows that private sector banks were not affected much due

to ownership. This study concludes that ownership as a significant impact on the efficiency evaluation of Indian banks.

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