

A Study of Efficiency of Banking System in India by Using DEA Approach

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Abstract- The aim of this paper is to study the Efficiency of public and private banks Affecting Factors through Data Envelopment analysis. Data Envelopment analysis is a Non-parametric approach to measure the effectiveness of multiple inputs and outputs with no underlying assumption of the functional form. This paper presents the effectiveness of private and public banks with 7 inputs and 6 outputs Using Constant returns to scale i.e BCC Model. The research outcomes present preferred indications about the selection of inputs and outputs for DEA application, technical efficiency and comparative study of public and private banks in Hyderabad. DEA Efficiency evaluation method identifies the functions and it improves the economy and brings improvement in the banking system.

KeyWords- DEA, DMUs, BCC Model, Technical Efficiency.

I. INTRODUCTION

The exact date of existence of indigenous bank is not known. But, it is certain that the old banking system has been functioning for centuries. Some people trace the presence of indigenous banks to the Vedic times of 2000-1400 BC. It has admirably fulfilled the needs of the country in the past. However, with the coming of the British, its decline started. Despite the fast growth of modern commercial banks, however, the indigenous banks continue to hold a prominent position in the Indian money market even in the present times. It includes shroffs, seths, mahajans, chettis, etc. The indigenous bankers lend money; act as money changers and finance internal trade of India by means of hundis or internal bills of exchange.

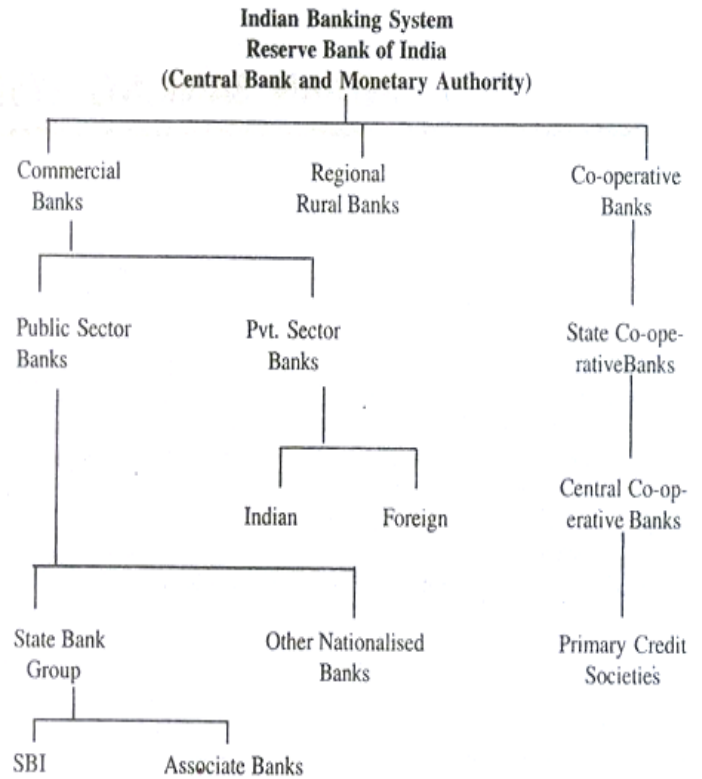
a. Defects:

The main defects of indigenous banking are:

- (i) They are unorganized and do not have any contact with other sections of the banking world.
- (ii) They combine banking with trading and commission business and thus have introduced trade risks into their banking business.
- (iii) They do not distinguish between short term and long term finance and also between the purpose of finance
- (iv) They follow vernacular methods of keeping accounts. They do not give receipts in most cases and interest which they charge is out of proportion to the rate of interest charged by other banking institutions in the country.

Structure of Organised Indian Banking System:

The organised banking system in India can be classified as given below:



STRUCTURE OF INDIAN BANKING SYSTEM

BCC Model :

$$Z (BCC) = \text{Min } \lambda$$

Subject to

$$\sum_{j=1}^n \lambda_j X_{ij} \leq \lambda X_{io} \quad i = 1, 2, \dots, m \quad (1.2)$$

$$\sum_{j=1}^n \lambda_j \mu_{rj} \geq \mu_{ro} \quad r = 1, 2, \dots, s$$

$$\sum_{j=1}^n \lambda_j = 1$$

$$\lambda_j \geq 0$$

There are ‘n’ decision making units each employs ‘m’ similar inputs and produces ‘s’ similar outputs. Z(BCC) is an efficiency measure corrected for scale differences. The BCC formulation is called as an envelopment problem. Since the production possibility set envelops all the observation tightly and hence the name Data Envelopment Analysis (DEA).

$Z(CCR) \leq Z(BCC)$, Since the dual of CCR is BCC without the constraint

$$\sum_{j=1}^n \lambda_j = 1$$

Input scale efficiency is defined as

$$Z(S.E) = \frac{Z(CCR)}{Z(BCC)}$$

Thus Z(CCR) can be multiplicatively decomposed as follows

$$Z(CCR) = \frac{Z(CCR)}{Z(BCC)} \times Z(BCC)$$

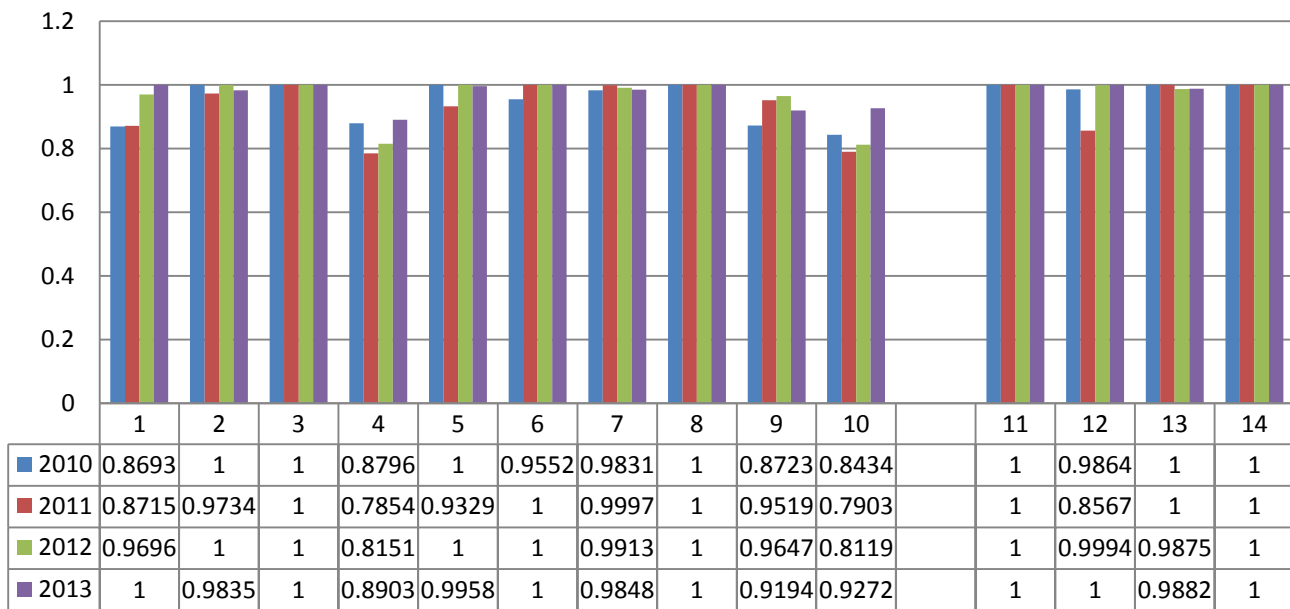
(Input scale efficiency)

(Input pure technical efficiency)

Empirical Investigation for Private Banks :The private banks are homogeneous with respect to their organizational structure, goals and objectives. However, they differ quite significantly in size and production level. Therefore, the scale of banks plays a vital role in their relative efficiency. The Efficiency results of 10 private banks using the BCC Model and Linear Programming model has been formulated

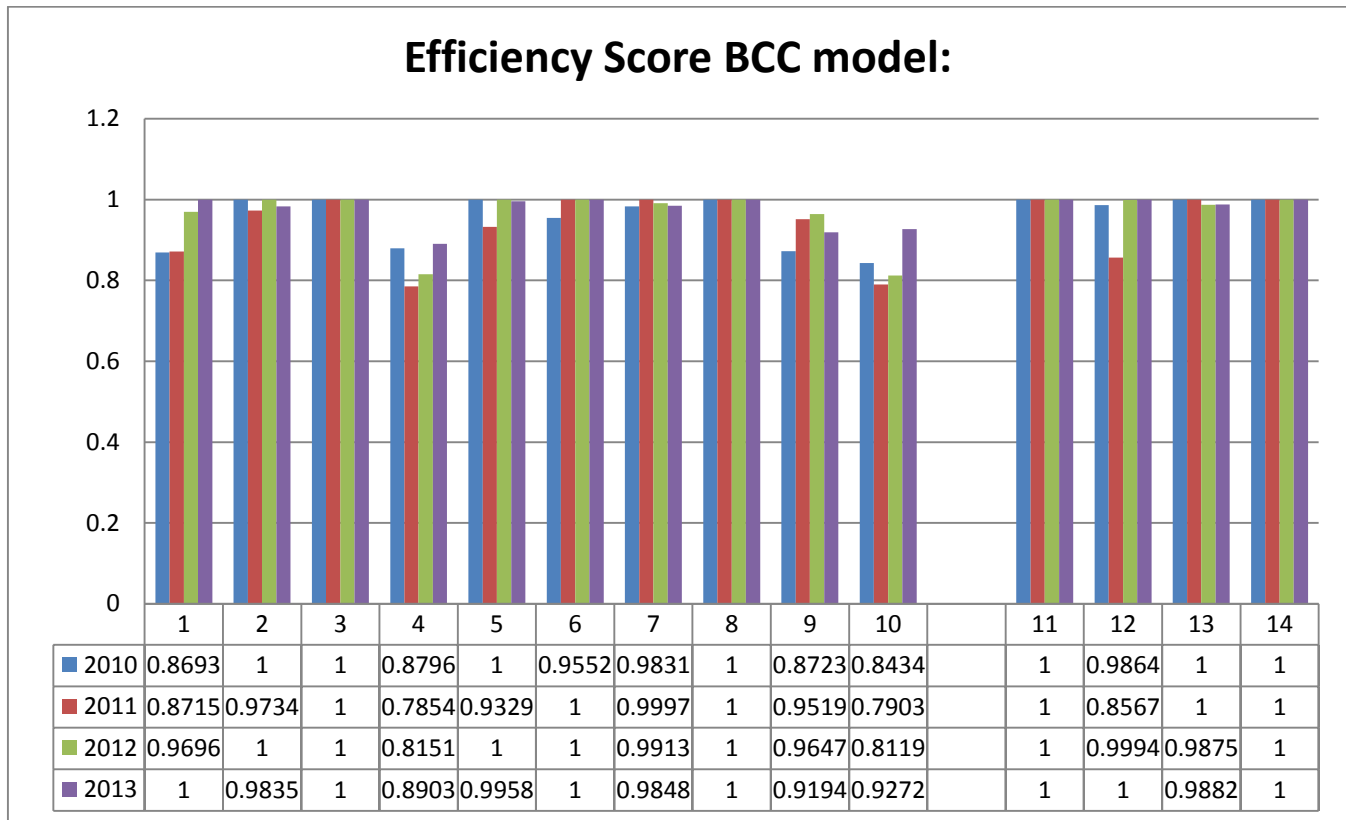
for the year 2010, 2011, 2012 and 2013. The main objective of the present study is to assess the performance of 10 Private Sector banks in India. The study, moreover, intends to assess the efficiency of Private Sector banks thereby identifying their influence in improving the Indian economy. By feeding the inputs and outputs, we generate the efficiency score of 10 private banks chronologically. The efficiency score (calculated annually over 2010 to 2013) has been indicated in the bar graph above. For example, from the above bar graph we can clearly see that DMU8 is utilizing its inputs to the fullest potential year-by-year and hence, we can consider it to be the benchmark or a standardization scale for other DMU’s in the study. Furthermore, we observe that DMU6 after facing an initial roadblock in 2010 has consistently maintained its score at 1, which bodes well for that particular DMU. Conversely, if we look at the case of DMU2, we observe that its efficiency scores after being at a steady score of 1 has noticed a drop in 2013, which suggests that the inputs are not translating into potential outputs. Hence, there is a decrease in the efficiency. The other DMU’s are utilizing only 80%-90% of the inputs that are being fed to them, which goes on to suggest that there is a considerable leakage in the output. Hence, we can safely state that if the DMU’s utilize their inputs to the maximum, not only will it help in attaining a theoretical efficiency of 1 but it will ensure that with every passing year the bank sees a steady growth in its turnover rate.

Efficiency Score BCC model:



Empirical Investigation for Public Banks : The public banks are homogeneous with respect to their organizational structure, goals and objectives. However, they differ quite significantly in size and production level. Therefore, the scale of banks plays a vital role in their relative efficiency. The Efficiency results of 14 public banks using the CCR Model

and Linear Programming model has been formulated for the year 2010, 2011, 2012 and 2013. The main objective of the present study is to assess the performance of 14 public sector banks in India. The study, moreover, intends to assess the efficiency of public Sector banks thereby identifying their influence in improving the Indian economy.



By feeding the inputs and outputs, we generate the efficiency score of 14 private banks and 14 public banks chronologically. The efficiency score (calculated annually over 2010 to 2013) has been indicated in the bar graph above. For example, from the above bar graph we can clearly see that DMU8 is utilizing its inputs to the fullest potential year-by-year and hence, we can consider it to be the benchmark or a standardization scale for other DMU's in the study. Furthermore, we observe that DMU6 after facing an initial roadblock in 2010 has consistently maintained its score at 1, which bodes well for that particular DMU. Conversely, if we look at the case of DMU2, we observe that its efficiency scores after being at a steady score of 1 has noticed a drop-in 2013, which suggests that the inputs are not translating into potential outputs. Hence, there is a decrease in the efficiency. The other DMU's are utilizing only 80%-90% of the inputs that are being fed to them, which goes on to suggest that there is a considerable leakage in the output. Hence, we can safely state that if the DMU's utilize their

inputs to the maximum, not only will it help in attaining a theoretical efficiency of 1 but it will also have far-reaching practical impacts within the society. For example, the credibility of the bank and its stature within its customers will grow with an increase in efficiency, and it will ensure that with every passing year the bank sees a steady growth in its turnover rate.

II. CONCLUSION

- (i) The banking practices need to be upgraded.
- (ii) Encouraging them to avail of certain facilities from the banking system, including the RBI
- (iii) These banks should be linked with commercial banks on the basis of certain understanding in the respect of interest charged from the borrowers, the verification of the same by the commercial banks and the passing of the concessions to the priority sectors etc.,
- (iv) These banks should be encouraged to become corporate bodies rather than continuing as family based enterprises.

III. REFERENCES

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