

# TECHNICAL EFFICIENCY OF PUBLIC SECTOR BANKS IN INDIA: A STUDY WITH ASSET INTERMEDIATION APPROACH

Ms. Nitashree Barman\*  
Dr. Kingshuk Adhikari\*\*  
Prof. Nikhil Bhusan Dey\*\*\*

*[Technical efficiency is defined as a feasible input/output vector where it is technologically impossible to increase any output without simultaneously reducing another output. The present study is concerned with the assessment of technical efficiency performance in respect of conversion of accumulated funds with the workforce into maximum earning assets of 26 public sector banks (PSBs) in India. The performance has been assessed with Data Envelopment Analysis (DEA) model following asset intermediation approach for the period of five years from 2007-08 to 2011-12. The analysis of the study reveals that the Public Sector Banks(PSB)industry performed well in 2011 and worst in 2008 in regard to maximisation of earning assets with input variables, namely, labour, loanable fund and physical capital. Moreover, average overall technical efficiency score ranges from 0.739 to 0.935 while majority banks i.e. 34.62 per cent fall in between 0.781-0.819. During the study period, the percentage of purely technical efficient banks was more than that of scale efficient banks and the trend of concentration among peer bank group is not steady over the study period. The study concludes that the public sector banks (PSBs) in India have been improving their performance over the period under considerations in generating earning assets but scale inefficiency is the bigger hurdle to their performance compared to pure technical inefficiency.]*

**Keywords:** *Public sector banks, Data envelopment analysis, Technical efficiency, Pure technical inefficiency, Scale inefficiency.]*

---

\* Research Scholar, Department of Commerce, Assam University (A Central University), Silchar, India.  
Email: nbnitashree@gmail.com

\*\* Assistant Professor, Department of Commerce, Assam University, Silchar, India.  
Email: adhikari.au@gmail.com

\*\*\* Professor, Department of Commerce, Assam University, Silchar, India.  
Email: nikhil.b.dey@gmail.com

### Prologue

Now-a-days, the assessment of efficiency of any organisation is the common practice of performance appraisal. It is the comparison between the observed and the potential/optimal output or inputs. The most common efficiency concept is technical efficiency. Koopmans (1951) defined technical efficiency as a feasible input/output vector where it is technologically impossible to increase any output without simultaneously reducing another output. Thus, it is a comparative and relative measure of how well inputs have actually been able to be processed so as to attain maximum potential outputs which is signified by the production possibility frontier. Generally, a bank is called technically efficient when it becomes able to transform its multiple input resources of financial and non-financial nature into maximum potential earnings from those resources. However, it becomes technically inefficient if the bank fails to produce the desired level of output from its limited resources and operates below the production frontier. Managerial practices and the scale or size of operations affect technical efficiency, which is based on engineering relationships but not on prices and costs. Technical efficiency therefore consists of pure technical efficiency and scale efficiency. The pure technical efficiency deals with managerial efficiency performance of the entire process while the scale efficiency relates to the economies of scale.

Banking institutions stimulate the economic development of a nation through capital formation process. A bank does the process through mobilizing

people's savings and investing them in productive avenues. The efficient intermediation of funds from savers to users enables the application of available resources to their most productive uses. The most efficient a banking system is in such resource generation and in its allocation, greater is its contribution towards productivity and economic growth. As resource allocation improves and real returns increase, saving would presumably respond and higher resource generation should result. Thus, efficient financial intermediation helps in improving economy-wide resource allocation thereby promoting economic growth all rounds (Mohan, 2006). In this context, Mokhtar et al. (2006) stated that efficiency measures are indicators of success, by which the performance of individual banks and banking industry as a whole can be gauged. Greater efficiency implies that individual banks can adapt better to a different operating environment via their improved ability to combine and utilise inputs. Having this background, the present study has attempted to evaluate technical efficiency performance of the public sector banks (PSBs) in India through which it has been tried to measure the level of performance of the banks in terms of its utilization of resources in generating maximum output. Thus, the present study is concerned with the question of "How much can output quantities be proportionality maximised without altering the input quantities?" or in other words, "How so far Indian public sector banks have been able to perform their intermediation function optimally in terms of conversion of accumulated funds with their workforce into maximum earning assets?".

### **Brief Reivew of Literature**

The importance of assessment of the efficiency performance in general and technical efficiency in particular urge the academicians, economists, bankers and other researchers to conduct studies on several aspects of efficiency. Some of the findings of the technical efficiency based studies conducted exclusively in the area of banking are briefly summarised as follows:

Mohan (2002), Ataulah, Cockerill and Le (2004) and Ataulah and Le (2006) discovered a positive relationship between the level of competition and efficiency of banks and a negative relationship between fiscal deficit and efficiency of banks. It was also found that banks were relatively more efficient in generating earning assets than in generating income. This was attributed to the presence of high non-performing loans. Sensarma (2005) found that public sector banks are efficient in respect of cost but not profit. Similarly, Suri (2011) concludes that bank managers are relatively good at selecting the optimum mix of inputs given the prices but they are not good at using the minimum level of inputs to produce a given level of output. Baidya and Mitra (2012) found that management inefficiency is the major source of overall technical inefficiency and dominance of banking operation at rural and semi-urban areas is the major contributor of scale inefficiency of the Indian banks. The study also exhibits that Indian banks are efficient in using deposits and operating expenses rather than branches and employees as inputs and more efficient in producing net interest income and priority sector

advances rather than non-interest income and net profit as outputs. On the other hand, Kumar and Kumar (2012) experienced that scale inefficiency is the main reason of inefficiency among banks in India and suggests that inefficient banks witnessing diseconomies of scale should reduce their size and those inefficient banks which are having increasing returns to scale should expand their business by deploying more resources. Trehan and Soni (2003) proved statistically that profitability significantly influences the operating efficiency in Indian public sector banks. Padmasai (2008) and Gardener, Molyneux and Linh (2011) identified some important determinants influencing efficiency, such as, size, capital, bank private credit, regulation, economic growth, inflation, state ownership, ownership, year, return on advance adjusted to cost of fund, ratio of wage bill to total intermediation cost, ratio of intermediation cost to total assets and the number of rural branches. Besides, Shobhana (2010) concluded that size of assets, network of branches and staff strength do not have significant influence over operational efficiency of public sector banks in India.

The above review of literature can be grouped into three ways, first relates to assessment of efficiency in banks with CCR model while second with BCC model under Data Envelopment Analysis (DEA) and third is exclusively concerned with the determination of factors influencing the efficiency performance of banks. The selection of inputs and outputs in most of the reviewed studies are based on income approach and/or combination of the intermediation approach and

income approach. There are a few existing studies based on asset intermediation approach and the present study contributes to the existing literature on efficiency following such approach.

### **Objectives of The Study**

The main objective of the study is to assess technical efficiency of public sector banks (PSBs) in India following asset intermediation approach during the period from 2007-08 to 2011-12. However, the specific objectives of the study are as follows:

- To measure the score of overall technical efficiency and its components of the public sector banks (PSBs) in India.
- To classify the public sector banks (PSBs) in India in order of their overall technical efficiency performance.
- To describe the efficiency performance of PSB industry and also, analyse the trend of concentration in the industry over the study period.

### **Scope and Methodology of The Study**

The present study is empirical in nature. The scope of efficiency is confined to the concept of technical efficiency. Under the present study, attempt has been made primarily to identify the banks among the PSBs in India which could utilise their given level of input resources most efficiently to have optimum level of output compared to their counterparts. Such attempt has been achieved based on the following methodology.

**Units of the Study:** The PSBs have been chosen for the study because these banks possess distinguish features of operation and more convergent towards social

activities as the larger government stake involved in their existence. The study considers all the 26 PSBs operating in India during the period under consideration.

**Data sources:** The requisite data have been collected from annual reports of the respective banks and RBI website.

**Efficiency Measurement:** Under the present study, Data Envelopment Analysis (DEA) has been employed in order to measure the technical efficiency performance of PSBs in India. It has been increasingly popular in measuring efficiency performance of different financial institutions like banks, insurance and mutual funds as it allows comparisons of relative efficiency of individual institutions and also, peer group performance. Most traditional method to benchmark efficiency performance is the ratio analysis of different parameters. However, the ratio analysis gives a one dimensional, incomplete picture of the course of action and fails to account for the interaction and trade off between the various parameters. In the banking sector, DEA has been widely applied to benchmark efficiency performance of different banks or to study the efficiency estimates of different branches of a particular bank. The method was initially proposed by Charnes *et al.* (1978).

DEA employs a mathematical programming technique to measure the relative efficiency of multi-product Decision Making Units (DMUs). The DEA efficient frontier is determined by connecting the best-practice banks in the sample through piecewise linear combinations that lie over the

observations, thereby ‘enveloping’ the data. The 100% technical efficient DMUs are situated on the best-practice frontier retaining a value of 1 and all others are technically inefficient relative to them having values between 0 and 1. The DEA model is briefly explained below:

Let us consider there are n banks to be evaluated [Banks (b)<sub>j</sub> (j=1, 2, ..., n)]. Each bank consumes ‘m’ different inputs of identical nature for all banks [Inputs(x)<sub>ij</sub> (i=1, 2, ..., m)] to produce ‘s’ different outputs of identical nature for all banks [Outputs (y)<sub>rj</sub> (r=1, 2, ..., s)]. The technology is defined by the following production possibility set

$$P = \{(x, y) : y \text{ can be produced from } x\}$$

The underlying assumptions are as follows:

- All observed input-output combinations are feasible.
- The production possibility set P is convex.
- Inputs are freely disposable.
- Outputs are freely disposable.

The method has been chosen for the study because it does not require an assumption of a functional form relating multiple inputs to multiple outputs and also provides an opportunity to identify the potential improvement for inefficient units by providing both the sources and amount of inefficiency.

In DEA literature, there are two basic models namely, CCR model and BCC

model. The basic difference between CCR and BCC lies on the fact that CCR model is based upon the assumption of constant returns to scale and measures the efficiency called overall technical efficiency while BCC model is based upon the assumption of variable returns to scale and measures efficiency called pure technical efficiency and scale efficiency. Moreover, both CCR and BCC models may be of two types-input oriented and output oriented. Input oriented efficiency model aims at reducing input amounts as much as possible while keeping at least the present output levels and output oriented efficiency model maximises the output level while using at least the present input levels. Under the present paper, BCC model with output orientation has been followed and the problem is

$$\text{Max } E_0 = \phi + \varepsilon \left( \sum_{i=1}^m S_i^- + \sum_{r=1}^s S_r^+ \right)$$

Subject to the Constraints :

$$\sum_{j=1}^n \lambda_j X_{ij} + S_i^- = X_{ijo}$$

$$\sum_{j=1}^n \lambda_j Y_{rj} - S_r^+ = \phi Y_{rjo}$$

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

$$\lambda_j, S_i^-, S_r^+ \geq 0$$

Where,

- $\phi$  = Efficiency score or level of efficiency
- $J_o$  = Recognised as an efficient bank in output oriented model
- $Y$  = Matrix of outputs ( $r=1,2,\dots,s$ ) of banks ( $j=1,2,\dots,n$ )
- $X$  = Matrix of inputs ( $i=1,2,\dots,m$ ) of banks ( $j=1,2,\dots,n$ )
- $\lambda_j$  = Weights of banks ( $j=1,2,\dots,n$ )
- $S_j^-$  = Slack variables of inputs ( $i=1,2,\dots,m$ )
- $S_r^+$  = Surplus variables of outputs ( $r=1,2,\dots,s$ )

**Selection of Inputs and Outputs:** The literature on banking output put forward four approaches: the production approach, the intermediation approach, the operating approach and the modern approach. Considering the importance of intermediation process of any financial institutions or banks in the economy, the present study employs the asset intermediation approach. Elyasiani and Mehdiian (1990) and English et. al (1993) used asset approach. The asset approach focuses on financial intermediaries

between depositors and final uses of bank assets. Under this approach, deposits and other liabilities together with real resources (labour and physical capital) are defined as inputs, whereas the output set includes earning assets such as loans and investments (Mohan, 2006). Thus, the present study considers the following intermediation function:

$$\text{Output (Earning assets)} = f(\text{No. of employees, loanable fund, physical capital})$$

**Table 1: Definition of selected Inputs and outputs**

No. of employees	It includes all the total number of full-time employees. Trehan and Soni(2003), Sensarma(2005), Baidya and Mitra(2012), Kumar(2008) employed this input in their studies.
Loanable fund	It is equal to the sum of deposits and borrowings. Deposits considered are the total funds collected on deposit mobilisation like demand deposits, saving bank deposits, term deposits and deposit of branches in India as well as outside India. Borrowings are the total fund collected through from different sources like RBI, other banks, other institutions and agencies in India as well as funds collected through borrowing from outside India. Kumar (2008) made efficiency study with this input.
Physical capital	It is equivalent to the value of fixed asset. Therefore, it considers all types of fixed assets such as premises, furniture & fixtures. Kumar (2008) also used this input for his study.

Earning assets	It is equal to the sum of loans and investment. Loans denote the rupee value of total loans provided in terms of bills purchased and discounted, cash credits, overdrafts & loans and term loans. Investment means the rupee value of total investment made in government securities, other approved securities, shares, debentures & bonds and subsidiaries & joint ventures in India as well as outside India. Gardener, Molyneux, and Linh (2011) worked with this variable.
----------------	---

Source: Author's compilation

**Tools of Analysis:** The descriptive statistics have been used such as mean and standard deviation in order to describe the variables used and implications of technical efficiency scores obtained by the public sector banks. Quartiles have been used in order to classify the banks into four groups on the basis of their overall technical efficiency performance of the banks.

### Results and discussion

This section provides descriptive statistics of the variables considered for the present study. Further, it also provides discussion of technical efficiency scores along with its decomposition into pure technical efficiency and scale efficiency scores. Table 2 shows the comparative values of inputs and outputs for the two extreme

period of the study. In 2007, on an average, 26982 employees of PSBs accumulated loanable fund of ₹1000810 and Physical Capital of ₹12717. In 2011, mean of all the inputs increased and reached to 29976 numbers of employees, ₹2101475 loanable funds and ₹14730 Physical Capital. Moreover, in 2007, average output variable i.e. earning assets of PSBs were only ₹985924, which have been increased to ₹2070150 in 2011. Besides, standard deviation of every variable in both the years is higher than the mean value of respective variables. And, the deviation increases in correspond to the expanded value of the variables. Thus, there is high deviation among the PSBs in the use of the quantity of each variable.

**Table 2: Descriptive statistics of inputs and output**

(in ₹)

Variables	2007-08		2011-12	
	Mean	Standard Deviation	Mean	Standard Deviation
<b>Inputs</b>				
Number of employees	26982	33574	29976	40066
Loanable Fund	1000810	1104511	2101475	2230573
Physical Capital	12717	13089	14730	12711
<b>Output</b>				
Earning assets	985924	1120303	2070150	2231719

Note: Based on data obtained from Annual Reports of concerned Banks and RBI website

Table 3 shows individual bank wise average technical efficiency score for the period of five years and it portrays that out of 26 PSBs, no bank has been found to be consistently technically efficient over the study period. On an average, Allahabad bank performed well compared to other banks, indicated by highest average overall technical efficiency score i.e. 0.935. On the other hand, though oriental bank of commerce, State Bank of Mysore and UCO bank showed consistently purely technical efficient having score equal to 1 but their scale inefficiency cause to become overall technically inefficient. The remaining 23 banks are inefficient in all respects or in other words they far behind from the efficient frontier. Further, it can be noted

that State Bank of Bikaner & Jaipur is the poorest one in managerial efficiency, which results most overall technically inefficient during the study period. In regard to scale efficiency, Indian overseas bank obtained highest average score of 0.988 which indicates its comparative superior performance in maintaining optimum size of operation. Moreover, average pure technical efficiency score of the PSBs ranges from 0.770 to 1 while average scale efficiency ranges from 0.784 to 0.988 and product of these two types of efficiency produces average overall technical efficiency score ranging from 0.739 to 0.935. Thus, both managerial inefficiency and inappropriate size of operation cause overall technical inefficiency of the PSB industry.

**Table 3: Average Technical Efficiency scores of PSBs: Bank wise Analysis**

Name of Banks	PTE	SE	OTE
Allahabad Bank	0.954	0.979	0.935
Andhra Bank	0.864	0.935	0.828
Bank of Baroda	0.833	0.885	0.757
Bank of India	0.823	0.906	0.766
Bank of Maharashtra	0.872	0.908	0.819
Canara Bank	0.850	0.904	0.791
Central Bank of India	0.793	0.952	0.760
Corporation Bank	0.995	0.922	0.917
Dena Bank	0.954	0.806	0.782
IDBI	0.836	0.941	0.802
Indian Bank	0.826	0.965	0.800
Indian Overseas Bank	0.870	0.988	0.862
Oriental Bank of Commerce	1.000	0.784	0.784
Punjab & Sind Bank	0.828	0.893	0.765

Name of Banks	PTE	SE	OTE
Punjab National Bank	0.947	0.980	0.929
Syndicate Bank	0.805	0.970	0.783
State Bank of India	0.831	0.926	0.791
State Bank of Bikaner & Jaipur	0.770	0.909	0.739
State Bank of Hyderabad	0.870	0.885	0.797
State Bank of Mysore	1.000	0.847	0.847
State Bank of Patiala	0.985	0.874	0.859
State Bank of Travancore	0.929	0.919	0.867
UCO Bank	1.000	0.831	0.831
Union Bank of India	0.968	0.898	0.866
United Bank of India	0.998	0.894	0.893
Vijaya Bank	0.959	0.963	0.929

Note: Based on data obtained from Annual Reports of concerned Banks and RBI website

PTE = Pure Technical Efficiency; SE =Scale Efficiency; OTE=Overall Technical Efficiency

Further, Table 4 clearly shows the classification of banks in order of their OTE score. During the study period, on an average, the worst overall technical efficiency was performed by Bank of India, Punjab National Bank, Central Bank of India, Bank of Baroda, and United Bank of India as these banks fall into the efficiency scores of below 0.781. While the highest percentage of 35 per cent, e.g., Bank of Maharashtra, Indian Bank, Indian Overseas Bank, Vijaya Bank, Union bank of India, Canara Bank, Punjab &Sind Bank, UCO bank, and

Dena bank fall into the efficiency range of 0.781-0.819. Oriental Bank of Commerce, State Bank of Bikaner & Jaipur, State Bank of India, State Bank of Mysore, and Andhra Bank fall into the efficiency range of 0.819-0.865. The remaining 27 per cent of banks such as Allahabad Bank, IDBI, Syndicate Bank, Corporation Bank, State Bank of Travancore, State Bank of Hyderabad and State Bank of Patiala, obtained efficiency scores above 0.865 which can be considered as relatively better performer to others.

**Table 4: Classification of Banks**

Efficiency Range	% of Banks in the Range	Name of Banks
Below 0.781	19.23 %	Bank of India, Punjab National Bank, Central Bank of India, Bank of Baroda, United Bank of India
0.781 - 0.819	34.62 %	Bank of Maharashtra, Indian Bank, Indian Overseas Bank, Vijaya Bank, Union bank of India, Canara Bank, Punjab & Sind Bank, UCO Bank, Dena Bank
0.819 - 0.865	19.23 %	Oriental Bank of Commerce, State Bank of Bikaner & Jaipur, State Bank of India, State Bank of Mysore, Andhra Bank
Above 0.865	26.92 %	Allahabad Bank, IDBI, Syndicate Bank, Corporation Bank, State Bank of Travancore, State Bank of Hyderabad, State Bank of Patiala

*Note:* Based on scores of overall technical efficiency as calculated in Table 3

Table 5 depicts the summary results of overall technical efficiency, pure technical efficiency and scale efficiency of PSB industry and trend of concentration among PSBs in the industry. In regard to pure technical efficiency, 7 (i.e. 26.92 per cent) banks were found to be acted as best practice frontier during 2007-2009 and increased by 11.54 per cent and 19.23 per cent in 2010 and 2011. The average of PTE scores of the PSB industry was lowest in 2008 with the score of 0.652. This suggests that average bank in the industry if producing its outputs on the 'efficient frontier' instead of at its current location would have needed only 65.2 per cent of the inputs currently being used in producing the output as the efficient banks. In other words, the magnitude of

managerial inefficiency is to the tune of 34.8 per cent, which indicates that by adopting the best practices of the frontier banks, on an average, banks could increase output by at least 34.8 per cent. Alternatively, PSB industry had the scope of producing 1.53 times more output than the currently observed level of output. The managerial efficiency performance of the industry improved in later years and obtained highest score of 0.983 in 2011. The percentage of banks which fall in 'concentration among peer banks groups' was 57.69 per cent in 2007 but it decreased in 2008 by 11.81 per cent and again it increased in 2009 by 46.16 per cent. But it showed decreasing trend in later years and reached to 76.92 per cent in 2011.

**Table 5: Technical Efficiency scores of PSB Industry and Trend of Concentration**

	2007-08	2008-09	2009-10	2010-11	2011-12
<b>PTE</b>					
No. of Efficient Banks	7	7	7	10	12
Average Efficiency (M)	0.928	0.652	0.948	0.982	0.983
Average Inefficiency (%)	7.2%	34.8%	5.2%	1.8%	1.7%
Standard Deviation ( $\sigma$ )	0.067	0.295	0.052	0.021	0.02
Interval (M- $\sigma$ ; M+ $\sigma$ )	(0.861,0.995)	(0.357,0.947)	(0.896,1)	(0.961,1)	(0.963,1)
% of Banks in Interval	57.69%	46.15%	92.31%	88.46%	76.92%
<b>SE</b>					
No. of Efficient Banks	4	2	3	8	7
Average Efficiency (M)	0.936	0.675	0.961	0.989	0.990
Average Inefficiency (%)	6.4%	32.5%	3.9%	1.1%	1%
Standard Deviation ( $\sigma$ )	0.063	0.211	0.035	0.018	0.018
Interval (M- $\sigma$ ; M+ $\sigma$ )	(0.873,0.999)	(0.464,0.886)	(0.926,0.996)	(0.971,1)	(0.972,1)
% of Banks in Interval	73.08%	57.69%	61.54%	84.62%	96.15%
<b>OTE</b>					
No. of Efficient Banks	4	2	3	5	6
Average Efficiency (M)	0.869	0.412	0.911	0.971	0.972
Average Inefficiency (%)	13.1%	58.8%	8.9%	2.9%	2.8%
Standard Deviation ( $\sigma$ )	0.092	0.209	0.051	0.024	0.023
Interval (M- $\sigma$ ; M+ $\sigma$ )	(0.777,0.961)	(0.203,0.621)	(0.860,0.962)	(0.947,0.995)	(0.949,0.995)
% of Banks in Interval	61.54%	80.77%	73.08%	53.85%	61.54%

Note: Based on data obtained from Annual Reports (Various issues) of concerned Banks and RBI website

During the study period, the number of scale efficient banks ranges from 2 to 8 (i.e. 7.69 per cent to 30.77 per cent) which is comparatively lower than that of the case of pure technical efficiency. In 2008, an average bank in the industry performed worst in scale management of the business with lowest average of 0.675 and thus caused business disadvantages. The PSB industry could have performed efficiently by producing 32.5 per cent or 1.48 times more output than the observed level of output. The performance improved in later years and obtained highest score of 0.990 in 2011. The percentage of banks under concentrated peer bank group decreased in 2008 by 15.39 per cent compared to as in 2007 but afterwards it showed increasing trend in later years due to decreasing over the later years and thus indicates stability in performance in the industry. In case of overall technical efficiency, the number of efficient banks ranges from 2 to 6 (i.e. 7.69 per cent to 23.08 per cent). The average bank in the industry performed worst in 2008 and well in 2011 with the score of 0.412 and 0.972. Moreover, the trend of the percentage of concentrated peer banks was not steady during the study period. It was highest in 2008 and lowest in 2010 with 80.77 per cent and 53.85 per cent.

### Findings and Conclusion

The main objective of the study is to assess technical efficiency performance of 26 public sector banks in India (PSBs) for the period from 2007-08 to 2011-12. The assessment was made with Data Envelopment Analysis (DEA) model with output orientation following the asset intermediation approach in selecting inputs and outputs variables. The analysis of the study finds that the PSB industry

performed well in 2011 and worst in 2008 in regard to maximisation of earning assets with input variables of labour, loanable fund and physical capital. But it could improve its performance with 2.8 per cent more output in 2011 and also could perform efficiently in 2008 by producing 1.53 times more output. During the study period, the percentage of purely technical efficient banks is more than that of scale efficient banks as evident by the range of the former i.e. from 26.92 per cent to 46.15 per cent while in case of later it is from 7.69 per cent to 30.77 per cent. Thus, overall technical inefficiency arises due to have relatively more inappropriate size of operation. Over the study period, on an average, no bank has been found to be consistently technically efficient. During the study period, oriental bank of commerce, State Bank of Mysore and UCO bank were found to be consistently purely technical efficient having score equal to 1 while on an average, Indian overseas bank showed superior performance in maintaining optimum size of operation. Moreover, on an average of study period, State Bank of Bikaner & Jaipur is the poorest one in managerial efficiency and oriental bank of commerce is the most scale inefficient bank. The overall technical score of the majority banks i.e. 34.62 per cent fall into the range of 0.781-0.819. Further, the trend of concentration among peer bank group is not steady over the study period. Thus, it is to conclude that the public sector banks (PSBs) in India have been improving their performance over the period under considerations in generating earning assets but scale inefficiency is the biggest hurdle to their performance compared to pure technical inefficiency. However, the banks have the

ample scope to improve and enhance their managerial quality in loans and investment generation process and it is suggested to the respective banks to improve their scale efficiency performance in order to avoid unfavourable effects of diseconomies of scale.

**References :**

- Ataullah, A., Cockerill, T. and Le, H., (2004). "Financial liberalization and bank efficiency: a comparative analysis of India and Pakistan", *Applied Economics*, Vol. 36, p.1915.
- Ataullah, Ali and Le, H., (2006). "Economic reforms and bank efficiency in developing countries: the case of the Indian Banking Industry", *Applied Financial Economics*, Issue No. 16, pp.653-663.
- Baidya, M. K. and Mitra, D., (2012). *Efficient Banking in Indian Banking Industry*, Abhijeet Publications, New Delhi.
- Elyasiani, E. and S. Mehdiian, (1990). "Efficiency in the Commercial Banking Industry, A Production Frontier Approach", *Applied Economics*, Vol.22, pp.539-51.
- English, M., S. Grosskopf, K. Hayes and S. Yaisawarng, (1993). "Output Allocative and Technical Efficiency of Banks", *Journal of Banking and Finance*, Vol.17, No.2-3, pp. 349-66.
- Gardener, E., Molyneux, P. and Linh, H. N., (2011). "Determinants of efficiency in South East Asian banking", *The Service Industries Journal*, Vol. 31, No. 16, December, pp. 2693-2791.
- Koopmans, T.C., (1951). "An Analysis of Production as Efficient Combination of Activities", in *Activity Analysis of Production and Allocation*, Koopmans, T.C., (eds.), *Cowles Commission for Research in Economics*, Monograph no.13, New York.
- Kumar, A. and Kumar, S., (2012). "A Study of Efficiency of Public Sector Banks in India", *IJMRS's International Journal of Management Sciences*, Vol. 1, Issue 2, June, p.105.
- Kumar, Sunil, (2008). "An Analysis of Efficiency-profitability Relationship in Indian Public Sector Banks", *Global Business Review*, Vol. 9, No. 1, pp. 115-129.
- Mohan, R., (2002). "Deregulation and Performance of Public Sector Banks", *Economic and Political Weekly*, Vol. XXXVII, No. 5, February 2-8, pp.393-77.
- Mohan, R., (2006). "Reforms, productivity and efficiency in banking: The Indian banking experience", *RBI Publication*, March, p.279. Retrieved from < <http://rbidocs.rbi.org.in/rdocs/Speeches/PDFs/69198.pdf>.
- Mokhtar, Hamim Syahrums Ahmad, AlHabshi, Syed Musa and Abdullah, Naziruddin, (2006). "A Conceptual Framework for and Survey of Banking Efficiency Study", *UNITAR E-Journal*, Vol. 2, No.2, June, p.1.
- Padmasai, T., (2002). Efficiency in Commercial Banks in India, Ph.D Thesis, *Department of Financial Studies*, University of Delhi, New Delhi.
- Sensarma, R., (2005). "Cost and Profit Efficiency of Indian Banks during 1986-2003- A Stochastic Frontier Analysis", *Economic and Political Weekly*, March, pp.1198-1207.
- Shobhana, V.K., (2010). "Operational Efficiency of Public Sector Banks in India-A Non Parametric Model", *Journal of Accounting and Finance*, Vol.24, No.2, April-September, pp.85-96.
- Suri, J., (2011). Commercial Banks in India: X-Efficiency and Total Factor Productivity Growth, *Regal Publications*, New Delhi.
- Trehan, R. and Soni, N., (2003). "Efficiency and Profitability in Indian Public Sector Banks", *IUP Journal of Bank Management*, Vol. II, No. 4, November, pp. 73-80.



# ADMISSION NOTICE 2014-2015



## IMS BUSINESS SCHOOL

[ AFFILIATED TO WEST BENGAL UNIVERSITY OF TECHNOLOGY & APPROVED BY AICTE FOR MBA ]

Royapur Ghutiary Sharif Station Road, P.O-Champahati, P.S-Sonarpur, South 24 Pgs,Kolkata-150,W.B.Pin-743330

E-mail :enquiry@imsbusinessschool.com Website :www.imsbusinessschool.com

## INSTITUTE OF MANAGEMENT STUDY

[AFFILIATED TO WEST BENGAL UNIVERSITY OF TECHNOLOGY (WBUT) FOR BBA(H),BCA(H),& MBA]

Eastern Metropolitan Bypass, 93, Mukundapur Main Road, Kolkata, West Bengal, Pin-700099,India

E-mail :imsbschool@gmail.com Website :www.imscol.org



### Master in Business Administration

Students will have to select any two Areas for Dual Specialization

1. Marketing

2. Finance

3. Human Resource

4. Systems

#### Application Procedure

Prospectus & Application form available for Rs.500/- payable in Cash/ Cheque /DD in favour of "INSTITUTE OF MANAGEMENT STUDY" payable at Kolkata. It can be made available by post on payment of an additional Rs.100/-as postal Charges.

- ◆100% job oriented programme ◆Post Graduate Programme with integrated ERP Training ◆Dual Specialization ◆Industry oriented curriculum with regular updating ◆Excellent faculty members ◆State of the Art Infrastructure ◆Air Conditioned Classrooms ◆Audio Visual Lecture theatre ◆100%Placement Assistance ◆Continuous Career Counseling ◆Personality Enhancement Programmed.



OUR DIRECTOR

SOME OF  
OUR  
RECRUITERS

#### Complementary Study Material

Complementary Tablet

Complementary Uniform

Complementary ERP Training

Complementary Soft Skill Training



OUR FACULTIES



### FOR ENQUIRY

CONTACT : 033 2426-4168 / 033 2837-1749  
+ 91 9831637683 / 9230860297 / 9830090791  
**BBA(H) BCA(H) MBA Ph.D**

