CHAPTER – II

REVIEW OF LITERATURE AND METHODOLOGY

2.0 Introduction

For any research, knowledge about the existing studies related to the features and aspects, suggestion and methodology is pre-requisite. The review of literature forms the background of the research problem. The researcher must be well acquainted with relevant theories in the field, reports and records, and also other relevant literature. This helps the researcher to find out data and other materials available for operational purposes. Such studies may suggest useful and even new lines of approach to the present problem.

The bank efficiency ratio is a quick and easy measure of a bank's ability to turn resources into revenue. The lower the ratio, the better the efficiency is. Generally, 50 percent is regarded as the maximum optimal ratio. An increase in the efficiency ratio indicates either increasing costs or decreasing revenues.

There are numerous methods to judge the efficiency of any firm. The Traditional method are Financial Ratio Analysis, Trend Analysis, Regression Analysis, Frontier Analysis and the like, and some studies have made best use of Trend Analysis, and Multiple Regression Analysis.

There are two broad approaches used to measure bank efficiency, the accounting approach, which makes use of financial ratios and econometric techniques. Traditionally accounting methods based on the use of financial ratios have been employed for assessing bank performance. However, the limitations of this method coupled with advances in management sciences have
led to the development of alternate methods such as non-parametric DEA and parametric Stochastic Frontier Approach.

Frontier analysis can be done either under Parametric Approach or Non-Parametric Approach. Frontier Analysis was developed from Farrell’s (1957) efficient concept which connects each point that has the highest efficiency and creates a production frontier. This analysis was preferred by some researchers because it can produce an objectively determined quantified measure of relative performance that removes the effects of many exogenous factors. From the recent past years many researchers, to measure the performance & efficiency, use Frontier Analysis through Non-Parametric Approach. Non-Parametric approach uses the data of the actual operations of the firms under study and through linear combinations of most efficient observations, to ascertain a frontier. Through this approach the efficiency is decided as a relative to the observed best, rather than an absolute value.

The most commonly used Non-Parametric Tool is Data Envelopment Analysis. It is a mathematical programming approach used to construct a frontier or production possibilities curve for a set of decision making units. The Term DMU is the most general description of the entity being analyzed. This DEA-tool is used to empirically measure the productive efficiency of these Decision Making Units.

The efficiency measurement through financial ratio is the traditional measure for bank productivity. At its simplest, it is the cost required to generate
each rupee of revenue. Its simplicity is an advantage, it is important to note that different business models can generate different bank efficiency ratios for banks with similar revenues. For instance, a heavy emphasis on customer service might lower a bank's efficiency ratio but improve its net profit. Banks that focus more on cost control will naturally have a higher efficiency ratio, but they may also have lower profit margins.

Allen Berger, John Leusner and John Mingo ¹ (1997) carried out the Bank Branch Efficiency over 760 Branches of a large U.S Commercial Bank for three years 1989,1990,and 1991. Their data set include information on several types of transactions including inter branch transactions. Their analysis revealed that most of the branches were considerably smaller than efficient scale- and there was a need for roughly about doubling the number of branches if they wanted to minimize the Bank Cost. The branching data revealed that some of the bank's branches did not perform to the level of its own best practice branch, which was a necessary condition for full efficiency. The bank might still be fully efficient relative to conventional bank frontiers which allowed for banks to be measured as efficient even if they had branches that are inefficient.

They also found that there were substantial differences in the value of bank branches that depended on efficiency. An efficient branch might be worth more than twice as much as an inefficient branch with the same deposit base. The authors suggested that banks should be able to improve the efficiency of
their branching networks by using efficiency measures along with their own performance measures.

So an understanding about the efficiency levels of public sector banks and private sector banks is felt necessary. This can be achieved by referring and reviewing various literatures available in the area of banking efficiency studies. The present chapter has been divided into two sections. In the first section an attempt has been made to review the related literature and the second section attempts to concepts and definitions which are relevant to this study.

Forthcoming paragraphs cover such an attempt of examining literature available in these areas. This is helpful to the researcher to identify the determinants of efficiency indicators of banks and their impact on the successful operation and profitability of public and private sector banks.

2.1 Review of Related Studies

The present study is focused to examine the efficiency of the sample banks. Usually most of the efficiency studies aim at informing the government or managerial authorities about the impact of their policies and assessing bank managers' ability in achieving optimum production, for which the efficiency estimates are helpful. Furthermore the efficiency analysis of commercial banks is worth studying under deregulation of banking system, ongoing economic transition, economic crisis all over the world and its recovery process, rebuilding of new banking system and improved services, may highlight some new suggestions.
Tyagarajan \(^2\) (1975), Rangarajan and Mampilly \(^3\) (1972) and Subramanyam G \(^4\) (1993) Singh R \(^5\) (2003), analyzed profitability management of banks under the deregulated environment with a few financial parameters for which the four major bank groups that is, public sector banks, old private sector banks, new private sector banks and foreign banks, were considered for analysis. They found that their profitability declined in the deregulated environment and emphasized to make the banking sector competitive in the deregulated environment.

Shah \(^6\) (1977) attempted on empirical relationship between costs at branch level which highlighted the factors responsible for declining profitability and increasing operational cost at branch level. But the author could not find a feasible method for appropriating overhead cost to various services at the branch level.

Sealey and Lindley \(^7\) (1977) considered that total loans and securities were outputs, whereas deposits along with labour and capital were inputs to the production process of banking firms. Another area, which requires urgent attention, was improving staff productivity particularly in public sector banks. There was need to downsize staff to cut high cost of staff expenses. It was also necessary to redistribute staff to strengthen the neglected areas of marketing. This research intended to cover some of the missing gaps by expanding effects that were looked at in analyzing efficiency of public and private sector banks and provide a more detailed comparison of the two leading sector banks in India.
Sealey and Lindley (1977) in their article considered banks as involved in two kinds of production, namely technical production and economic production. Technical Production is a process wherein the banks borrow funds from various surplus spending sources and lend those funds to the deficit spending units (Those who need funds) which is also known as financial intermediation. But the Economic Production is a process involves using loanable funds borrowed from depositors, along with capital, labour and material inputs provide some services like safekeeping, cheque clearance, book keeping to depositors and create earning assets. Under this approach Value of loans and Investments called Earning Assets can be used as output, while Deposits and borrowed funds, Capital, Labour Cost, Operating Costs and Interest Expense can be taken as input. Berger and DeYoung (1997) in his paper suggested that, it would be more appropriate to consider Non-Performing loans and loan losses in estimating the efficiency of commercial banks. Because it is true that NPA can be caused on account of negative economic shocks or unpredictable events such as bad luck, natural disasters, and the like. But, at the same time, it cannot be denied that poor management in managing and monitoring the loan portfolio and controlling of operating expenses, excessive risk taking results in higher non-performing loans.

Bhatia (1978) in his article attempted to analyze the economic performance of Indian banking system as reflected in its output, price and profitability over the period 1950-68. The main findings of this study were: (i) the profit performance of Indian banking system during the period 1950-68 had
been satisfactory; (ii) the structure of banking system (represented by the number of bank offices and the deposit concentration ratio) during the period had an insignificant effect on its performance.

Amardeep\textsuperscript{11}(1983) studied different factors which affected the profitability of commercial banks with the help of multiple regression analysis. Many other studies used censored regression techniques just like TOBIT, for determining and analyzing the determinants of efficiency of industries including banking.

Chakrabarthy\textsuperscript{12}(1986) in his paper made an empirical assessment about the relative efficiency of commercial banks taking profit, earnings and expenses as variable. The author suggested that every bank should carry out some exercise in evaluating their performance.

Vashist\textsuperscript{13}(1987), in his doctoral work, evaluated the performance of PSBs with regard to six indicators, namely, branch expansion, deposits, credit, priority sector advances, differential rate of interest, advances and net profits, over the period 1971-83. The study ranked Indian Overseas Bank at the top and Dena Bank at the bottom. To improve the performance of commercial banks, the study suggested development of marketing strategy for deposit mobilisation, profit planning and strengths, weaknesses, opportunities and threats analysis in banks.

Ojha (1987)\textsuperscript{14} in his paper made an international comparison of productivity and profitability of public sector banks of India and evaluated indicators of total working capital, number of employees, establishment expenses, net profit, establishment expenses as a percentage of net working
funds to measure the productivity and net profit as a percentage of working funds were used to measure the profitability. It was observed that the productivity of the public sector banks in India increased for the period 1969 – 1984. It was stated that the profitability of the banks in India was low. He proposed computerization of the Indian banks, development of human resources and co-operation of the employees to improve the profitability and productivity of the public sector banks in India.

Roth and Van der Velde\textsuperscript{15} (1991) in their attempt to study the factors influencing the profits of the bank concluded that, any branch that was efficient on the operational side but inefficient on profitability could improve its performance by focusing on changes to the client base through marketing strategies. A bank operating inefficiently would do well to focus first on the improvement of its operations.

Elyasiani and Mehdian\textsuperscript{16} (1992) in their paper, “Productive Efficiency performance of minority and nonminority owned banks: A Non-parametric Approach.” investigated the relationship between minority-owned banks and nonminority-owned banks. They found that the differences in efficiency of the two kinds of banks were statistically insignificant.

The DEA technique has been used in efficiency analysis of banks rather than Branches; some of the examples are: Berg et al.\textsuperscript{17} (1993); Favero and Papi\textsuperscript{18} (1995); Sathye\textsuperscript{19} (2001)

Lovell (1993)\textsuperscript{20} observed that, in spite of improvements made in DEA Analysis, there was a main criticism about DEA which posed the difficulty of
drawing statistical inference. But in recent years many improvements including Bootstrap method have been introduced to overcome the deficiencies. The Bootstrap method was first introduced by Efron\textsuperscript{21} (1979) and since then it had become a powerful and popular statistical tool.

Gorton and Rosen\textsuperscript{22} (1993) in his article suggested that there is a link between control and Risk. They commend that risky banks would generally have poorer efficiency. But Wheelock and Wilson\textsuperscript{23} (1994) also found that failure was more prevalent in banks with lower efficiency than in banks with higher efficiency levels. Thus it was suggested that apart from serious liquidity and high non-performing loans, banks with high risk of failure tend to have low efficiency scores.

Subramanian and Swami \textsuperscript{24}(1994), in their paper, “Comparative Performance Of Public Sector Banks In India”, have analyzed and compared the efficiency of six public sector banks, four private sector banks and three foreign banks for the year 1996-97. Operational efficiency was calculated in terms of total business and salary expenditure per employee. The analysis revealed that higher per employee salary level need not result in poor efficiency and business per employee efficiency co-efficient was also calculated. Among the PSBs, Bank of Baroda registered the high efficiency and operating profit per employee. Among the private sector banks Indus Bank followed by Citibank Registered the highest and the second highest operating profit per employee respectively. However, among the Nationalized Banks there existed wide variations in efficiency.
Subrahmanyam, G and Swami (1994), in their paper, “Comparative Performance of Public Sector Banks in India,” analyzed and compared the efficiency in six public sector banks, four private sector and three foreign banks for the year 1996-97. Operational efficiency was calculated in terms of total business and salary expenditure per employee. The analysis revealed that higher per employee salary level need not result in poor efficiency and business per employee efficiency co-efficient was also calculated. Among the PSBs, Bank of Baroda registered the high efficiency and operating profit per employee. Among the private sector banks Indus Bank followed by Citibank registered the highest and second highest operating profit per employee respectively. However, among the Nationalized Banks there existed wide variations in efficiency.

Gorton and Rosen (1995) argued that owner-managed (or more independent) banks had taken excessive risks during periods of poor industry performance and they were too conservative during periods of healthy industry performance, thus suggesting that they might be less efficient. Risky banks would generally have poorer efficiency estimates and this theory was supported by DeYoung (1997) and Berger and DeYoung (1997) who argued that there was a relationship between management quality, cost efficiency and non-performing loans.

Coelli (1996) in his paper commented that large number of papers used Data Envelopment Methodology after Charnes, Cooper, and Rhodes coined this tool in the year 1978. DEA calculates the efficiency of an organization
within a group relative to observed best practice within that group. A linear program is used to create a virtually efficient Decision Making Unit (DMU) that sits on the efficiency frontier, in which each DMU has 100 percent efficiency relative to every other DMU.

Berger and Humphrey (1997) stated that the first task in evaluating the performance of financial institutions was to separate those that performed well from those performing poorly.

Sarker and Das (1997) in their study compared the performance of public, private and foreign banks for the year 1994-95 by using measures of profitability, productivity and financial management. They found that the PSBs showed poor performance when compared to the other two categories. However, they cautioned that no firm interference could be derived from a comparison done for a single year.

Berger and Humphrey (1997) in their article mentioned that intermediation approach (assuming that the financial institutions were mediators between the supply and the demand of funds) might be appropriate. Accordingly Deposits and Interest on Deposits, Non Interest Expenses, Personnel Expenses were considered as Inputs; Total Loans, Other Earning Assets, Interest Income, Non-Interest Income were considered as Outputs.

Cummins and Weiss (1998) in their paper explained modern frontier efficiency methodologies which were rapidly becoming the dominant approach for measuring a firm's performance. These methodologies estimate efficiency of technical, cost, revenue and profit frontiers by comparing each firm in the
industry to a reference set consisting of all other firms. The econometric approach which involved estimating a cost, revenue or profit function, while the mathematical programming approach which was usually implemented using linear programming were the two methods used. The implementation, most frequently used was Data Envelopment Analysis (DEA). The authors concluded that frontier efficiency methods dominated traditional techniques in terms of developing meaningful and reliable measures of the performance of insurance firms.

Economic Research Department of State Bank of India (2000) had analyzed the Performance of the 27 Public Sector Banks for the year 1999-2000 with that of the preceding year. By selecting four different categories of indicators namely, Business Performance, Efficiency, Vulnerability and Labor Productivity Indicators, it carried out the analysis.

Das. A (2000) in his article estimated the efficiency of the public sector banks in India for the year 1998. He found that nationalized banks were less efficient than the State Bank of India group. They had to improve their performance by focusing upon asset quality, management and congestion of labour. He also found that a welcoming increase was evident on Non Interest Income, indicating the banks’ option to show risk adverse behavior by opting for risk free investment over risky loans.

Prashanta Athma (2000), in his doctoral work, “Performance of Public Sector Banks – A Case Study of State Bank of Hyderabad, made an attempt to evaluate the performance of Public Sector Commercial Banks with special
emphasis on State Bank of Hyderabad. The period of the study for evaluation of performance was from 1980 to 1993-94, a little more than a decade. In this study, Athma outlined the Growth and Progress of Commercial Banking in India and analyzed the trends in deposits, various components of profits of SBH, examined the trends in Asset structure, evaluated the level of customer satisfaction and compared the performance of SBH with other PSBs, Associate Banks of SBI and SBI. Statistical techniques like Ratios, Percentages, Compound Annual rate of growth and averages were computed for the purpose of meaningful comparison and analysis. The major findings of this study were that since nationalization, the progress of banking in India was very impressive. All the three types of deposits had continuously grown during the study period, though the rate of growth was the highest in fixed deposits. A comparison of SBH performance in respect of resource mobilization with other banks showed that the average growth of deposits of SBH was higher than any other bank group. Profits of SBH showed an increasing trend indicating a more than proportionate increase in spread than in burden.

Swamy (2001) through his article made a comparative study on the performance of different bank groups since 1995-96 to 1999-2000 and attempted to identify factors which could have led to changes in the position of individual banks in terms of their share in the overall banking industry. He analyzed the share of rural branches, average branch size, trends in bank’s profitability, share of public sector assets, share of wages in expenditure, provision and contingencies, net non-performance assets in net advances,
spread, had been calculated. He concluded that Nationalized Public Sector Banks, in many respects were much better than private banks.

P.Ganesan \(^{38}(2001)\), in his study, “Determinants of Profits and Profitability of Public Sector Banks in India: A Profit Approach’ evaluated various determinants of profits and profitability. The significant determinants identified by him were, Interest Cost, Interest Income, Deposit per Branch, Credit to Total Assets and the like.

T.T.Ram Mohan \(^{39}(2002)\), in his study “Deregulation and Performance of Public Sector Banks” compared the profitability of public sector banks with private sector banks and foreign banks. He found that over the years, public sector banks improved their profitability, but lagged behind in their ability to attract deposits at favorable interest rates and have been slow in technology upgradation and improving staffing and employment practices, which may have negative implications on their long term profitability.

Prashanth K Reddy \(^{40}(2002)\), focused on the comparative study of Non Performing Assets in India in the Global context - similarities and dissimilarities, remedial measures and concluded the importance of a sound understanding of the macroeconomic variables and systemic issues pertaining to banks and the economy for solving the NPA problem along with the criticality of a strong legal and legislative framework. Foreign experiences must be utilized along with a clear understanding of the local conditions to create a tailor made solution which is transparent and fair to all stakeholders.
Drake and Hall\textsuperscript{41} (2003) examined the technical and scale efficiency of Japanese banks and found that the small sized banks were more efficient. At the same time similar study on India by Ketkar et al. (2008) found that there was a positive relationship between size and technical efficiency.

Singh R\textsuperscript{42} (2003), in his paper Profitability Management in Banks Under Deregulated Environment, analyzed profitability management of banks under the deregulated environment with some financial parameters of the major four bank groups that is public sector banks, old private sector banks, new private sector banks and foreign banks. Profitability declined in the deregulated environment. He emphasized to make the banking sector competitive in the deregulated environment. They should prefer noninterest income sources.

Webb\textsuperscript{43} (2003) in the United Kingdom (UK) suggested that the smaller banks were more likely to report technical inefficiency. So further studies may have to be carried out to provide better understanding,

V. Pitrey\textsuperscript{44} (2003) in his study “Measuring Bank Efficiency: Productivity Verses Profitability” reported that while assessing productivity in terms of business per employee and per office, foreign banks were far better than the nationalized and other scheduled commercial bank, but in terms of number of accounts per employee, they were at the bottom of the list.

Drake and Hall\textsuperscript{45} (2003), using a non-parametric approach, examined the technical and scale efficiency of Japanese banks and found that the small-sized banks were more efficient, while Webb\textsuperscript{46} (2003) found that smaller banks were more likely to report technical inefficiency.
Ram Mohan TT, Subhash C. Ray (2004), in their paper ‘Long Run Performance of Public and Private Sector Bank Stocks’ Vol 37, made an attempt to compare the three categories of banks—Public, Private and Foreign—using physical quantities of inputs and outputs, and comparing the revenue maximization efficiency of banks during 1992-2000. The findings showed that PSB’s performed significantly better than private sector banks but not differently from foreign banks. The conclusion pointed to a convergence in performance between public and private sector banks in the post-reform era.

Nagarajan (2004) focused his attention on ‘Other Income of the Banks’ and analyzed the trend from 1993-94 onwards in a wider perspective. He emphasized in this article that other income of the banks had been receiving focused attention mainly for two reasons. First, Banks were being urged to increase this source of income. Second, there was a spurt in other income of banks during 2001-02. Main conclusions of this study were: (i) Since 1993-94, banks other income had been increasing at a faster pace compared with interest earnings, (ii) Component-wise, income from commission, exchange and brokerage was most important, (iii) Income from exchange transactions was also relatively steady, (iv) Private Sector banks logged rapid rate of growth, which might be attributed to the entry of new banks, (v) Foreign bank retained their share, (vi) Cost of the public sector banks, and (vii) There was unusual increase in 2001-02 in other income of banks.

Bonin, Iftekhar Hasan, Paul Wachtel (2005), used data from 1996 to 2000 to investigate the effects of ownership, especially by strategic foreign
owners, on banks efficiency for eleven transition countries in an unbalanced panel consisting of 225 banks and 856 observations. They concluded that privatization by itself was not sufficient to increase bank efficiency as government-owned banks were not appreciably less efficient than domestic private banks. They also found that foreign-owned banks were more cost-efficient than other banks and they also provided better service, in particular if they had a strategic foreign owner.

Galagedera, Edirisuriya and Priyadesa\(^{50}\)(2005) in their article “Performance of Indian Commercial Banks” investigated efficiency and productivity in a sample of Indian commercial banks over the period 1995-2002. They were of the opinion that the public sector banks revealed a modest growth in productivity due to the technological changes brought out by them. They concluded that smaller banks were less efficient than larger banks and that the larger banks had a high equity to assets and high return to average equity ratios.

Sathye\(^{51}\)(2005) in his paper, “Technical Efficiency of Large Bank Production in Asia and the Pacific”, examined the determinants of efficiency of the commercial banks for the year 2000 taking a sample of 377 banks. The independent variables of profitability, market power and the per capita income had the most significant positive relationship with the efficiency scores. Size had a negative and a significant effect on the efficiency scores of the commercial banks under study.
Das and Ghosh\textsuperscript{52} (2006) in his paper investigated the performance of Indian commercial banking sector during the post-reform period. They evaluated several efficiency estimates of individual banks using non-parametric Data Envelopment Analysis. They employed three different approaches, viz. intermediation approach, value-added approach and operating approach in defining inputs and outputs of banks.

Mahesh and Rajeev\textsuperscript{53} (2006) in their study attempted to measure the deposit efficiency of Indian commercial banks by using stochastic frontier technique for the period 1985-2004. The results showed that, on an average, Indian commercial banks were around 75 per cent efficient in producing deposits compared to the best performing banks within the sample. Public sector banks as a group rank first in the deposit efficiency measures. Deregulation and resulting competition among the banks had significant impact on the deposit efficiency of Indian commercial banks.

Murugesan and Rao Ataullah, A. and Le, H.(2006) in their article, “Economic Reforms and Bank Efficiency in Developing Countries: The Case of the Indian Banking Industry”.\textsuperscript{54} analyzed the performance of Public Sector banks in the context of (i) productivity and growth, (ii) social objectives, and (iii) profitability ratios over the period 1973-86. The major conclusions of the study are (i) the performance in terms of deposit mobilization, opening of branches and deployment of advances during the study period had been impressive, (ii) both operating expenditure and establishment expenditure declined during this period indicating an efficient management of banking
activities, (iii) deposit-credit ratio in rural areas increased, (iv) public sector banks not performed better in terms of profitability, and (v) gross and net profits also declined.

The studies in Singapore conducted by Sufian 55(2006) and Majid revealed that smaller banks had better efficiency estimates.

Figueira et al56, (2006) conducted efficiency studies at African Banks and attempted to verify whether privately owned banks outperformed government owned banks and whether foreign ownership enhanced bank performance. But the study failed to cover other aspects like control, risk and size that might affect bank’s efficiency and did not provide detailed analysis for comparison purposes.

Vijay Kumar Varadi and Pradeep Kumar Mavaluri and Nagarjuna Boppana57(2006), analyzed and measured the efficiency of banks in India and observed that the public sector banks were having high efficiency in terms of productivity, profitability, financial management and asset quality, whereas the private banks were having a very high inefficiency levels during the sample period.

Ali Ataullah and Hang Le 58(2006) in their study “Economic Reforms and Bank Efficiency in Developing Countries: The Case of the Indian Banking Industry” tested the hypotheses regarding the possibility of relationship between the three elements of the economic reforms, namely, fiscal reforms, financial reforms and private investment liberalization and bank efficiency. They found a positive relationship between the level of competition and bank
efficiency. However, a negative relationship between the presences of foreign banks efficiency was observed, which they attribute to short run increase in costs due to the introduction of new banking technology by foreign banks. Further, they suggested that the fiscal deficits negatively influenced the bank efficiency.

Grigorian and Manole⁵⁹ (2006) performed a To-bit Regression Analysis to identify the determinants of the efficiency scores of the 1074 banks in 17 transition economies for the period 1995 – 2008. Capital, large market share, foreign ownership, new establishments and the gross domestic product were the most important factors affecting the efficiency of banks.

Kuen-Horng, Lu, Min-Li Yang, and Feng-Kai Hsiao and Hsin-Yi Lin⁶⁰ (2007), used interest expenses, fixed assets, deposits, number of employees as input variables; interest income, non-interest income, investments and loans (Earning Assets) as output variables. The study suggested that the banks should adjust all the variables in order to enhance their overall operating efficiency.

Sinha⁶¹ (2007) in his article, compared the performance of four public sector and eight private sector general insurance companies in respect of technical efficiency, scale efficiency and total factor productivity for the years 2003-04 and 2004-05 by using DEA and malmquist total factor productivity index. The study had taken two outputs: Net Premium Income and Gross Income, and three inputs namely Equity Capital, Operating Expense and Number of Agents. The results indicated that the public sector insurance
companies exhibited higher mean technical efficiency than the observed private companies (income as the output). However, in respect of gross income as the output indicator, the result was contingent on the return to scale.

Under constant return to scale, the public sector insurance dominated the private sector in terms of means technical efficiency while under variable return scale the private sector insurance had a marginally higher technical efficiency than the public sector insurance companies.

Jim Wong, Tom Fong and Eric Wong (2007) in their paper titled “Determinants of the Performance of Banks in Hong Kong” studied the factors that determined performance of banks in Hong Kong. They were of the view that the cost efficiency of banks to be the major determinant of profitability. They concluded that smaller banks were more vulnerable to intense competition in the loan market since larger banks offered services at lower prices.

Manish Mittal and Aruna Dhade (2007) in their study “Profitability and Productivity in Indian Banks: A Comparative Study” compared various categories of banks on their productivity and profitability. They found that the public sector banks were less profitable than the private sector and foreign banks in terms of overall profitability. The authors were of the view that the key to increase profitability was to increase productivity. Public sector Banks, in their opinion, should reduce over staffing, forge a strategic alliance with the rural regional banks and should embrace latest technology to increase their profitability.
Jahangir, Shill and Haque (2007), in their article mentioned that the traditional measure of profitability through share holder’s equity was entirely different in the banking industry compared to any other business sector where loan-to deposit ratio worked as a very good indicator of profitability since it depicts the status of asset-liability management of banks. But with regard to banking sector, the risk was not only associated with asset liability management but also related to growth opportunity. Smooth growth ensured higher future returns to owners which meant not only current profits but future returns as well. So, market size and market concentration index along with return to equity and loan-to-deposit ratio felt essential for analyzing the banks’ profitability.

Samuel nwanze (2007), in his study titled, ‘A Comparative Study on the Efficiency of Banks in Nigeria And South Africa’, found that Banks with the lowest risk profile were found to be the most efficient followed by banks with the highest risk profiles. The largest banks in the sample were found to be the most efficient while the mid-sized banks were the least efficient. The results also showed that South African banks were more technically efficient than Nigerian banks.

Sandeep Kaur (2007), through his paper, “Growth of Commercial Banks in India”, suggested that the banks should device the strategies to cut down and control the costs, without adversely affecting the quality of services. The cost should be kept at a minimum possible level, a cautious approach to
the branch expansion policy, reduction in the level of establishment expenses, optimum use technology that minimizes the costs and the like..

Akmal and Saleem\textsuperscript{67} (2008) observed that the banking efficiency was enhanced since 2000 and that foreign banks were more efficient than local private and public owned banks while studying the technical efficiency of 30 banks efficiency.

Kusum W. Ketkar \textsuperscript{68} (2008) examined the efficiency and productivity growth in the Indian Banking Sector from 1990 to 1995 using the Data Envelopment Analysis methodology. Due to data availability problems at the individual bank level, the study included only 39 banks. Several conclusions stand out. First, for the sample, the overall technical inefficiency was about 31 per cent and remained stable over the examined period. Second, foreign banks showed the highest level of efficiency. Third, between 1990 and 1995, state and private banks experienced a reduction in pure technical efficiency, while for the nationalized and the foreign banks, it remained the same. Fourth, the size was found to be positively related to pure technical efficiency and to the number of branches negatively. Fifth, fewer branches and metropolitan location of foreign banks, perhaps partially explained their efficiency over domestic banks. This paper finally concluded that Indian domestic banks need to greatly improve their efficiency through introduction of computer technology, improved management skills and through consolidation and merger of banks.

Hasan, Wang and Zhou\textsuperscript{69}(2009) investigated the influences of institutional developments such as market economy, financial deepening,
private sector, property rights and rule of law on the bank efficiency in China for the period 1993 – 2006. The outcome of the study was that the cost efficiency had an inverse relationship with the financial deepening and financing in the private sector. They also stated that the profit and cost efficiency had a positive significant relationship with the presence of the private sector and property rights.

Sufian, Noor and Noor\textsuperscript{70} (2009) estimated the determinants of the efficiency scores of the Islamic banks in 16 Middle East and North Africa and Asian countries during the study period 2001 – 2006 through the regression analysis technique. There was a positive and a significant relationship between efficiency and intensity of the loans, size, capitalization, and profitability. It is apparent that banks with a smaller marketshare and a low ratio of nonperforming loans exhibited higher efficiency scores.

Zhi Shen\textsuperscript{71} (2009) in his study mentioned about four kinds of output and input specifications which were commonly used for banking efficiency analysis such as intermediation approach, production approach, dual approach and value added approach.

Hu, Chu, Hu and Lee\textsuperscript{72} (2009) studied the efficiency of banks in China during the period of 1995 to 2004 with a sample of 11 banks. The results showed that the Banks in China were affected by the ownership type and policy regime of the operational environment.

Srivastava, Aman Gupta & Rakesh\textsuperscript{73} (2009) in their study, “The Relative Efficiency of Indian Commercial Bank in Post Reform Period : DEA
Approach.”, concluded that the efficiency of Indian Commercial Banks during 2004-2008, via Operation Approach which investigated from the perspective of Cost/Revenue management, to be very high whereas the efficiency of Indian Commercial Banks during 2004-2008, via intermediation approach which investigated from the perspective of Deposits into Loans & Advances, was moderately low.

Prasad K.V., Ravinder N.G and Maheshwari Reddy D(2011)⁷⁴, studied the soundness of the Indian Banking Sector by using the CAMEL model. (CAMEL is an acronym for six measures namely, Capital Adequacy, Assets Quality, Management Soundness, Earnings Quality and Liquidity). They selected Public Sector Banks and Non Public Sector Banks. They ranked various banks in the order of soundness. But they could not make conclusive statements about the soundness of the banking sector as a whole.

Dhiraj Jain, Ms. Nasreen Sheikh(2012)⁷⁵, in their study, Loans, Net Profit and NPA have been taken for evaluating the operational performance of Private Sector Banks. The period of study ranged between 2007 and 2011. They attempted to study: the growth of lending of different private banks; the sources or causes that promoted or weakened the credit programme of private banks; the correlation between the Loans, NPA and Net Profit to the total private banking industry. They analyzed the data through trend analysis for interpretation. Their study revealed a positive correlation between Loans, NPA and Net Profit.
Prabhakar A.K, Feroze Sheriff.S and V.Nagadevara (2012), in their study, “Relative Efficiency of Banks in India- Evaluation and Policies for Improvement”, made an attempt to determine the relative efficiency of 80 banks from groups of Public, Private and Foreign banks in India and also to identify the factors that contribute most to the inefficiency of the banks and suggest improvements. They used the data for the years 2008, 2009 and 2010 for the purpose measuring the efficiency of banks using Data Envelopment Analysis. Their study concluded that the foreign banks were the best performing banks in terms of relative efficiency, followed by Private Sector Banks and the public Sector Banks in that order. They suggested that the private and public sector banks should not depend more on Deposits as a source of funding, increase interest income by extending Credit to good credit worthy customers so that NPA would also be at minimum.

Aswini Kumar Mishra, et al. (2012), in their study selected twelve banks. For their analysis they used Net NPA to Net Advances, Operating Profit by Average working funds, Net Profit to Average Assets, Interest Income to Total Income, Liquid Assets to Total Assets, Liquid Assets to Total Deposits as the ratios determining the soundness and efficiency. Based upon the values of the ratios of the selected banks they ranked them. Higher Average values get higher rank. The best ratio got rank one and so on. It was concluded by them, based on the data set they studied, that Private Sector Banks were at the top of the list with their best performance in terms of soundness.
Sharma, Sharma and Barua\textsuperscript{78} (2012) assessed the determinants of efficiency of the commercial banks in India for the period 2000 – 2010 with a sample size of 64 banks through the technique of To-bit Regression Analysis. Their results revealed that the age of the banks and profitability of the banks had positive impact on the efficiency levels of the banks in India. Bank diversification had a negative impact on the efficiency levels of the banks in India.

Prabakar.A.K, Feroze Sheriff, Nagadevara.S.V\textsuperscript{79}(2012) in their paper, ‘Relative efficiency of Banks In India-Evaluation and policies for improvement.’, have emphasized that evaluating whether the banks in India operate efficiently or not?, was very essential. So that it will be helpful to identify the most efficient banks and benchmark the relative efficiency of individual banks against the most efficient banks and it also helps to evaluate the impact of various policy measures on the performance of banks.

Raina and Sharma\textsuperscript{80}(2013) in their study evaluated the efficiency of the commercial banks in India for the period 2006 – 11. Their study revealed that the regulatory environment was the major cause of the low efficiencies than any other managerial problems. Competitive initiatives adopted by the banks and the technology upgradation in banking improved the efficiency of the banks during the study period.

N. Seshadri, Dr. D.Pradeep kumar, & Dr. T. Narayanareddy\textsuperscript{81}(2013) concluded, from their study, ‘Efficiency of Public & Private Commercial Banks in India-A Comparative study’, that the banks larger in size were
lesser in efficiency and smaller in size were more efficient and here the banks bigger in size were not able to control operations and banks having good control in operations and implementation on new schemes and services to customers in small size were utilizing their resources at optimal level in earning revenue from time to time.

Dr. Iram Khan in his study, 'Public vs. Private Sector – An Examination of Neo-Liberal Ideology’, commented that the superiority of the public or private sector remained inconclusive and was likely to remain so in the future. It was not possible to determine the superiority of one over the other, through case studies, which could only be selective in nature.

2.2 Methodology of the Study

2.2.1 Period of Study:

For the purpose of this study, ten years of period from 2001-02 to 2010-11 is considered relevant due to the fact that this is the period during which the Indian banking sector has undergone many reforms and faced global financial crisis. Though the studies relating to efficiency of financial institutions especially commercial banks are numerous, most of them are related to western countries and that too they are restricted to very few years covering not more than four or five years.

2.2.2 Collection of Data:

Based on the objectives of the study, the present study attempts to measure the efficiency levels of both Public Sector Banks and Private Sector Banks in India. The proposed study will be based only on secondary data. The
required secondary data have been collected from various annual reports of
selected commercial banks, Annual Reports of Reserve Bank of India, RBI,
Indian Banks’ Association Bulletins, and Statistical Reports of performance
rating agencies, Basel Committee Reports, various websites, publications and
the like.

2.2.3 Sample Design

A sample design is a definite plan for obtaining a sample from a given
population. It refers to the techniques or the procedure, the researcher would
adopt in selecting items for the sample. Sample design may lay down the
number of items to be included in the sample, that is, the size of the sample.
Sample design is determined before collection of the data. At present there are
27 Public Sector Banks and 32 Private Sector Banks operating in India. The list
of Public and Private Sector Banks are listed in Table1.1 and Table 1.2
respectively.
**Table 2.1**  
List of Public Sector Banks in India

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Bank</th>
<th>S.No</th>
<th>Name of the Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Andhra Bank</td>
<td>16</td>
<td>UCO Bank</td>
</tr>
<tr>
<td>2</td>
<td>Allahabad bank</td>
<td>17</td>
<td>Union Bank of India</td>
</tr>
<tr>
<td>3</td>
<td>Bank of India</td>
<td>18</td>
<td>United Bank of India</td>
</tr>
<tr>
<td>4</td>
<td>Bank of Baroda</td>
<td>19</td>
<td>Vijaya Bank</td>
</tr>
<tr>
<td>5</td>
<td>Bank of Maharashtra</td>
<td>20</td>
<td>State Bank of India</td>
</tr>
<tr>
<td>6</td>
<td>Canara Bank</td>
<td>21</td>
<td>State Bank of Bikaner and Jaipur</td>
</tr>
<tr>
<td>7</td>
<td>Central Bank of India</td>
<td>22</td>
<td>State Bank of Hyderabad</td>
</tr>
<tr>
<td>8</td>
<td>Corporation Bank</td>
<td>23</td>
<td>State Bank of Indore</td>
</tr>
<tr>
<td>9</td>
<td>Dena Bank</td>
<td>24</td>
<td>State Bank of Mysore</td>
</tr>
<tr>
<td>10</td>
<td>Indian Bank</td>
<td>25</td>
<td>State Bank of Patiala</td>
</tr>
<tr>
<td>11</td>
<td>Indian overseas Bank</td>
<td>26</td>
<td>State Bank of Saurashtra</td>
</tr>
<tr>
<td>12</td>
<td>Oriental Bank of Commerce</td>
<td>27</td>
<td>State Bank of Travancore</td>
</tr>
<tr>
<td>13</td>
<td>Punjab and Sind Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Punjab National Bank</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Syndicate Bank</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
TABLE 2.2
List of Private Sector Banks in India

<table>
<thead>
<tr>
<th>S.No</th>
<th>Name of the Bank</th>
<th>S.No</th>
<th>Name of the Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The ING Vysya Bank Ltd</td>
<td>17</td>
<td>Bareilly Corporation Bank Ltd</td>
</tr>
<tr>
<td>2</td>
<td>The Federal Bank Ltd</td>
<td>18</td>
<td>Nainital Bank Ltd</td>
</tr>
<tr>
<td>3</td>
<td>The Jammu Kashmir Bank Ltd.</td>
<td>19</td>
<td>The Ratnakar Bank Ltd</td>
</tr>
<tr>
<td>4</td>
<td>Bank of Rajasthan Ltd</td>
<td>20</td>
<td>The Ganesh Bank of Kurundwad Ltd</td>
</tr>
<tr>
<td>5</td>
<td>Karnataka Bank Ltd</td>
<td>21</td>
<td>SBI Comm. &amp; Int. Bank Ltd</td>
</tr>
<tr>
<td>6</td>
<td>The South Indian Bank Ltd</td>
<td>22</td>
<td>Development credit Bank Ltd</td>
</tr>
<tr>
<td>7</td>
<td>The United Western Bank Ltd</td>
<td>23</td>
<td>Madura Bank Ltd</td>
</tr>
<tr>
<td>8</td>
<td>The Catholic Syrian Bank Ltd</td>
<td>24</td>
<td>Centurion Bank of Punjab Ltd</td>
</tr>
<tr>
<td>9</td>
<td>The Karur Vysya Bank Ltd</td>
<td>25</td>
<td>HDFC Bank</td>
</tr>
<tr>
<td>10</td>
<td>Tamilnadu Mercantile Bank Ltd</td>
<td>26</td>
<td>ICICI Bank Ltd</td>
</tr>
<tr>
<td>11</td>
<td>The Laxmi Vilas Bank Ltd</td>
<td>27</td>
<td>Indusland Bank Ltd</td>
</tr>
<tr>
<td>12</td>
<td>The Sangli Bank Ltd</td>
<td>28</td>
<td>Kotak Mahindra Bank Ltd.</td>
</tr>
<tr>
<td>13</td>
<td>The Dhanlaxmi Bank Ltd</td>
<td>29</td>
<td>UTI Bank Ltd</td>
</tr>
<tr>
<td>14</td>
<td>Bharat Overseas bank Ltd</td>
<td>30</td>
<td>Times Bank Ltd</td>
</tr>
<tr>
<td>15</td>
<td>City Union Bank Ltd</td>
<td>31</td>
<td>Bank of Punjab Ltd</td>
</tr>
<tr>
<td>16</td>
<td>Lord Krishna Bank Ltd</td>
<td>32</td>
<td>Yes bank Ltd.</td>
</tr>
</tbody>
</table>

From the above lists, 9 Public Sector Banks and 9 Private Sector Banks have been selected by the researcher. The criteria followed by the researcher for the selection of banks are:
1) The financial information of the bank is adequate enough for analysis during the study period.

2) The banks under study have been established for more than ten years.

Among the banks which fulfilled the above criteria, nine Public and nine Private Sector Banks have been randomly selected for the present study.

Table-1.3, depicted below, gives a list of Public and Private Sector Banks selected as sample for the present study.

Table 2.3

List of Sample Commercial Banks Selected For the Study

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Name of Public Sector Bank</th>
<th>S.No.</th>
<th>Name of Private Sector Bank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Allahabad Bank</td>
<td>1</td>
<td>Axis Bank</td>
</tr>
<tr>
<td>2</td>
<td>Andhra Bank</td>
<td>2</td>
<td>City Union Bank</td>
</tr>
<tr>
<td>3</td>
<td>Bank Of Baroda</td>
<td>3</td>
<td>Dhanalaxmi Bank</td>
</tr>
<tr>
<td>4</td>
<td>Bank Of India</td>
<td>4</td>
<td>Federal Bank</td>
</tr>
<tr>
<td>5</td>
<td>Canara Bank</td>
<td>5</td>
<td>HDFC Bank</td>
</tr>
<tr>
<td>6</td>
<td>Corporation Bank</td>
<td>6</td>
<td>ICICI Bank</td>
</tr>
<tr>
<td>7</td>
<td>Dena Bank</td>
<td>7</td>
<td>Karur Visya Bank</td>
</tr>
<tr>
<td>8</td>
<td>Indian Overseas Bank</td>
<td>8</td>
<td>Laxmi Vilas Bank</td>
</tr>
<tr>
<td>9</td>
<td>State Bank Of India</td>
<td>9</td>
<td>South Indian Bank</td>
</tr>
</tbody>
</table>
2.2.4 Factors considered for measuring the Efficiency Level of Sample Banks:

In this study, considering banks as financial intermediaries, the researcher measures the efficiency through three efficiency indicators such as operating, financial and personnel efficiency.

2.2.5 Operational Efficiency:

For measuring operational efficiency the variables considered appropriate: Net Profit to Total Advances, Operating Expenses to Total Assets, Total Expenses to Total Assets, Earning Assets to Total Assets, Net profit per branch, Expenses per branch.

2.2.6 Financial Efficiency:

For measuring financial efficiency the following variables are considered appropriate for the analysis. They are: Net Profit to Total Assets, Own Capital to Total Assets; Debt to Equity; Non Performing Assets to Total Advances, Return on Equity, Advances to Total Assets.

2.2.7 Personnel Efficiency:

For measuring personnel efficiency the following variables are considered appropriate for the analysis. They are: Deposits per employee, Advances per Employee, Expenses per Employee, Income per Employee, Personnel Cost per Employee, Non Performing Advances per Employee, and Business per Employee.
2.2.8 Tools for Analysis:

Measurement of the Efficiency of banks can be divided into two parts based on their methodologies, namely, traditional measures and frontier approaches. An extensive literature has evolved examining financial efficiency issues and different methodological approaches have been employed to investigate financial efficiency (i.e. parametric and non-parametric techniques). However, only a limited number of studies have so far investigated, how input and output variable factors influence bank efficiency levels in the long run, say, a period of ten years.

The major studies carried out under traditional measures are: Divitia and Venkatachalam (1978), Angadi (1983), Karkal (1983), Subramanyam (1985), Subramanyam and Swamy (1994 a,b), Das and Sarkar (1994), Hansda (1995) and Das (1999). Findings of the above studies are; the banking functions were more or less uniform, production differences between firms not only with technological improvement but also from competence, there were wide disparities in their measure of performance of bank groups and rural branches were more profit making than urban. The traditional approaches used in the above studies were ratio analysis, regression analysis, Index number approach, taxonomic method, multivariate analysis and the like., and the frontier approaches mainly characterized into two groups i.e., parametric and non-parametric approaches.

In order to examine the data collected from various sources, different statistical tools and techniques were utilized. According to the objectives and
requirements of the study chosen relevant tools and techniques were identified. The data collected were thoroughly analyzed using various tools of analysis such as Annual Averages, Annual Growth rate, Simple Ratio Analysis, Simple Percentage Analysis, Trend Analysis, SPSS (Statistical Packages for Social Sciences), Data Envelopment Analysis, and the like. Time series data from 2002 to 2011 is used for the study.

With the tools mentioned above the researcher hopes to measure and compare the operating, financial and personnel efficiency of Public Sector Banks as well as Private Sector Banks in India.

2.3 Concepts and Definitions

The following are the concepts and definitions which form part of the present study

2.3.1 Efficiency

The simple dictionary meaning for the term goes: Efficiency is the ability to produce something, with a minimum amount of effort. Efficiency in a commercial organization is measured normally with the ratios of revenue and expenses.

Efficiency Ratio = Expenses / Revenue

2.3.2 Cost Efficiency:

It is the extent to which a bank's performance is close to the best practice banks for producing the same outputs under the same environmental
conditions. Cost efficiency explains how is the bank's cost to the minimum cost determined by the best practice banks in the sample.

2.3.3 Profit Efficiency:

It is the measure to determine how close a bank is to achieve the maximum profit given a certain level of input prices and output prices is termed as Standard profit efficiency. But the alternative profit efficiency measures how close a bank is to achieve maximum profit at a given output level rather than output prices.

2.3.4 Productivity:  It is the ability and willingness of an economic unit to produce maximum possible output with given inputs and technology. Higher the output per unit of input, higher is the productivity.

2.3.5 Bank efficiency Ratio:

It is a quick and easy measure of a bank's ability to turn resources into revenue. Efficiency measures performance of the bank in a normative sense by comparing it with the industry leader within or across the borders. The lower the ratio of Resources to Revenue, better the efficiency. 50% is generally regarded as the maximum optimal ratio. An increase in the efficiency ratio indicates either increasing costs or decreasing revenues.

While, a bank may improve in terms of productivity over a period, its efficiency score may decline if rise in its productivity is slower than that of the industry’s best performer.
2.3.6 The efficiency frontier:

It is derived from the examples of best practice contained in the data we have considered which represent a standard of performance that the branches not on the efficient frontier could try to achieve.

2.3.7 Technical Efficiency (overall efficiency):

Technical Efficiency is a ratio of minimum costs that could have spent to produce a given output bundle to the actual costs spent. It is a measure of how well the firm is processing inputs to achieve its outputs, as compared to its maximum potential for doing so, as represented by its production possibility frontier. Thus, technical efficiency of the bank is its ability to transform multiple resources into multiple financial services. A bank is said to be inefficient if it operates below the frontier.

This overall Technical efficiency is decomposed into Pure Technical Efficiency and Scale Efficiency (also known as Allocative Efficiency).

2.3.8 Pure Technical Efficiency:

It is a measure which reflects the managerial performance to organize the inputs in the production process. It is used as an index to capture managerial performance. Pure technical occurs when a bank maximises the output from the given level of input.

2.3.9 Scale Efficiency (Allocative Efficiency):

It is a measure that explains the ability of the management to choose the optimum size of resources, that is, to decide on the bank’s size or in other words to choose the scale of production that will attain the expected production
level. Scale efficiency is also known as Allocative efficiency which means the unit’s ability to optimize on the use of its inputs, given their respective prices.

In other words a unit is said to be scale efficient when its size of operations is optimal so that any modifications on its size will render the unit less efficient. The scale efficiency occurs when a bank chooses revenue maximising mixes of output.

2.3.10 Relative efficiency:

Efficiencies relative to the data are considered. It does not, and cannot, give absolute efficiencies. It is a hypothetical efficient unit derived as a weighted average of efficient units, to act as a comparator for an inefficient unit.

Efficiency = Weighted sum of outputs / weighted sum of inputs.

2.3.11 Decision Making Unit (DMU):

It is a distinct unit within an organisation that has flexibility with respect to some of the decisions it makes, but not necessarily completes freedom with respect to these decisions.

2.3.12 Intermediation Approach:

This has been introduced by Sealey and Lindley (1977) which considers that banks are involved in two kinds of production namely technical production and economic production. Technical Production is a process wherein the banks borrow funds from various surplus spending sources and lend those funds to the deficit spending units (Those who need funds) which also known as financial intermediation. But the Economic Production is a process which
involves using loanable funds borrowed from depositors, along with capital, labour and material inputs provide some services like safekeeping, cheque clearance, and book keeping to depositors and create earning assets. Under this approach Value of loans and Investments called Earning Assets can be used as output, while Deposits and borrowed funds, Capital, Labour Cost, Operating Costs and Interest Expense can be taken as input.

2.3.13 Production Approach:

This approach views banks as institutions producing financial services for the account holders, by processing transactions and documents for customers and insurance services. Under this approach number of transactions performed, number of deposit accounts, number of loans outstanding are dealt as outputs whereas the inputs included are price of labour, cost of assets maintenance, price of deposits etc.

2.3.14 Dual Approach:

This approach assumes that Deposit has dual characteristics such as input as well as output; As input, Deposits are raised as raw materials for loans; as output Deposits provide liquidity, safekeeping as a product, and facilitate payment services to depositors. So under Dual Approach deposits are taken both as input as well as output.

2.3.15 Value Added Approach:

Banking functions involve significant expenditures on non-monetary services hired such as Labour cost, Fixed Asset Maintenance Cost as inputs in order to produce non-interest banking services as outputs.
Some researchers view banks as producers of loans and deposit accounts (Sherman and Gold, 1985) and measure output either by the number of transactions or by the number of accounts serviced (Production Approach).

Others have argued that output of banks should be measured in terms of the value of loans and inputs are various costs of labour, capital, operations, deposits and other resources (Intermediation Approach).

Unlike the production approach, which focuses on operating cost and ignores interest expense, in the intermediation approach both operating and interest expenses are included in the analysis.

In addition, the more a bank generates in fees, the more it may concentrate on activities that carry high fixed costs (and thus create worse efficiency ratios). The degree to which a bank is able to leverage its fixed costs also affects its efficiency ratio; that is, the more scalable a bank is, the more efficient it can become. For these reasons, comparison of efficiency ratios is generally most meaningful among banks and the definition of a "high" or "low" ratio is made within this context.
References


Roth and Van der Velde (1991), ‘Customer perceived Quality Drives Retail banking in 90s, Bank Management, November, Pp. 29-35.


Subramanian and Swami (1994) in their paper, Comparative performance of public sector banks in India” Prjanan, Vol. XXII.


36 Prashantha Athma (2000), Ph D research submitted at Usmania University Hyderabad, “Performance of Public Sector Banks – A Case Study of State Bank of Hyderabad.


70 Sufian, F and Noor, M.A (2009). The determinants of Islamin banks’ efficiency changes –Empirical evidence from the MENA and Asian banking
75 Dhiraj Jain, Ms. Nasreen Sheikh,” A Comparative Study Of Loan Performance, NPA And Net Profit In Selected Indian Private Banks.”, International Journal of Marketing, Financial Services & Management Research., Vol.1 Issue 9, September 2012, ISSN 2277 3622.