Indian banks have done remarkably well in the post-reforms era which is reflected in diversification, intermediation costs, embracing global best practices, profitability, risk management etc. This chapter presents, besides the objectives, scope, period of study, methodology, database and chapter layout in addition to the review of the existing literature which aims at documenting the scenario and changes in the banking sector in reform era especially in the first decade of the twenty first century.

INTRODUCTION

The Indian banking sector has undergone a sea change in the wake of the economic reforms that were unleashed over a decade-and-a-half ago in 1991-92 amidst a ‘current account’ crisis, which, in turn, was caused by India’s poor macroeconomic performance. As an obvious response to that challenge, the banking sector reforms topped the then P.V. Narasimha Rao government’s agenda which embarked on initiating a series of measures to reinforce the domestic banking sector. Sweeping reforms which were introduced over the years have not only successfully delivered the goods but have also helped change the sector’s face forever. Among one of the significant changes have been the opening up the sector to private sector players, including foreign banks. These new entrants have not only brought in significant changes in the way of banking was done but also reshaped the banking landscape in the country.

A notable change has been the increasing role of technology in banking, which was almost non-existent in the pre-1991 era. Besides, the emergence of bank-
assurance and universal banking has been the other hallmarks of this fabulous journey. Further, another key area of change has been the improved regulatory regime in the country’s banking sector, thanks to the Reserve Bank of India’s proactive stance, which is reflected in the fact that Indian banks could manage to escape almost unhurt during the past crises like the Asian Financial Crisis of 1997, dotcom bust in 2000, and more recently the Sub-prime Crisis in 2007 and the subsequent global banking crisis of 2008. Indeed, Indian banks have done remarkable progress in terms of risk management practices.

The domestic banks have also drawn the attention of their counterparts from the other parts of the world for their adherence to the global best practices in areas such as capital adequacy, NPA management, asset quality and lending prudence. In the meanwhile, the entry of foreign banks as well as new genre of private banks, has also set the consolidation process in motion which has seen significant Mergers and Acquisitions (M&As) activities take place in the private sector while the Public Sector Banks (PSBs) gear up for similar actions as the competitive pressure mounts.

As a consequence, today, Indian banks are as efficient as their western counterparts though in terms of size the former still has a long way to go. The greater thrust on deploying technologies to deliver enhanced customer experience through offering a combination of convenience, comfort, and anytime anywhere or 24×7 banking has led to the improved bottom line for the banks. Increased treasury gains have also significantly boosted their profitability over the years as banks have forayed into trading products such as interest rate futures, currency futures besides the relaxation of trading rules have helped banks improve their profitability by earning significant treasury profits. Further, diversification into various fee-based businesses
too has resulted into tremendous gains for the banks as far as their bottom line is concerned. Also, the introduction of the SARFAESI (Securitisation, and Reconstruction of Financial Assets and Enforcement of Security Interest) Act in 2002 has proved to be a major milestone in Indian banks' post-reforms journey.

While there is no denying the fact, these all have percolated into improved performances for the banks in India, it won't be appropriate to generalise that the impact is uniform across the board. In other words, it would be wrong to assume that all banks have benefited equally in the post-reforms era. And, that there may be some laggards. Against this backdrop, this literature review aims to track the performances of the Indian banking sector, in the pre and post-reforms era through the review of studies done so far by various researchers on the subject.

**REVIEW OF LITERATURE**

Plenty of studies, both investigative and prescriptive, do exist in the area of Indian banking by the expert committees, academicians. Some of the significant studies have been reviewed in brief for a comprehension and also for identifying the research gap. These studies are presented under different groups as below.

**Performance**

Zahir, M.A. (1980)\(^1\) advocated transfer pricing as one of the important methods for evaluating branch level performance of commercial banks. The study suggested that: (i) Branches should be given credit at a minimum transfer price than at which excess funds are transferred to the head-office, (ii) other than profits, necessary weightage should also be given to management objectives, such as priority sector lending, recovery, deposit mobilisation etc., when applied to a selected number of different kinds of branches of a particular nationalised bank, the suggested transfer
price mechanism made the profit statement of branches more meaningful and informative for evaluating the branch level performance.

B.P. Agarwal (1981) conducted a study on “Progress and Policies of Commercial Banks after Nationalisation” analysed the performance of banks and their policies and progress after nationalisation. The study observed that during the period of inflation, liberal credit expansion to neglected sectors was not possible and as such the success of banks nationalisation cannot be evaluated on the basis of priority sector lending.

Nayan, Kamal (1982) suggested a model for performance evaluating of commercial banks in India. His study led to the conclusion that at the micro level, the existing system of performance budgeting has left much to be desired, and thus cannot be objectively used for evaluation of branch level performance. He stressed the need for developing an integrated performance Index that will act as a evaluating the performance of commercial banks.

Joshi (1987) discussed the desirable norms and techniques to study the performance of the banks. Prior to nationalisation, profit was the sole criterion for evaluating the performance of commercial banks. After nationalisation, profitability and social banking became the major objectives of commercial bank and thus any evaluation banks performance has to be in relation to these goals.

Raju (1991) also discussed the question of viability of commercial banks. The study observed that since 1980, environmental constraints and pressures, statutory pre-emption, administered prices of various services, monetary instruments, concessional lending, public preference for long-term and high yielding deposits have continued to threaten the commercial viability of Indian banking. It was observed that
the relative performance of foreign banks with respect to profits, deposits and credits was better as compared to their Indian counterparts, because of their high level of operational efficiency, labour productivity, better fund management and relatively limited regulations. However, on account of being foreign banks, their impact on the economy and output yielding activities is limited. Credit deposit ratios of foreign banks have also been high.

Swami and Subrahmanyam (1993) made a comparison between the levels of efficiency in 28 public sector banks during the period 1971 to 1973 and 1987 to 1989. Compound growth rates were calculated to analyse the increase in different banking indicators during this period. Taxonomic technique was used for driving a single measure of performance based on several indicators of bank business activities. Most of the banks registered huge difference with respect to their overall performance as compared to the ideal one.

Kamal Nayan (1998) assessed the performance of commercial banks in India in which he has critically appraised the performance at the bank level as well as branch and developed an evaluation model, which can be used by executives at macro and micro level for performance.

Das (1999) was to compare the inter-bank performance of the public sector banks for three years (1992, 1995 and 1998) in the post-reform period. He found a certain convergence-taking place in the performance of the banks during the period under study. It was observed that whereas an increase in emphasis on non-interest income is a welcome change but the banks behaviour to opt for risk free investments over risky loans may have serious effects on the economy.
Money and Banking Division of the Economic Research Department, State Bank of India, Mumbai (2000)\(^9\) have analyzed the performance of public sector banks for the year 1998-99 vis-à-vis the preceding year on four broad parameters of Business performance which, focused on deposits, advances, investments and net profit; Efficiency indicators using Return on Equity (ROE) by decomposition model, Vulnerability-measured by Capital-to-Risk Weighted Assets Ratio (CRAR) and Non-Performing Assets (NPAs) and labour productivity – measured by 3 ratios – Business per employee, profit per employee and average assets per employee cost.

Parasuraman (2001)\(^10\) attempted to measure the performance of major banks in India in the year 1998-99 and sought to compare their ranking under various criteria with a possible ranking under the criteria of EVA (Economic Value Added). For this purpose, EVA has been computed taking certain assumptions as to the cost of equity and operational profit adjustments. A rank correlation coefficient has struck between the ranks under different criteria in comparison to that under EVA. The study found that ranking of banks under Return on Assets assumes close resemblance to the ranking under EVA, where as the ranking under other criteria like total income, interest, as percentage of total assets spread and net profits did not match with the ranking under EVA.

Singh (2001)\(^11\) made an attempt to assess the impact of the reforms on the operational performance and efficiency of the commercial banks in India. The ratio analysis has been used as a major tool for assessing the performance of the selected commercial banks. The study revealed that total income as a percentage of working funds to total assets, and spread as percentage to. total income/working funds/total advance/total deposits have improved in the post-reform period against the pre-reform in most of the banks. Total income, interest earned, other income, spread, total
expenses, interest expended, operating expenses and establishment expenses are comparatively more consistent in the post-reform period. The hypothesis that the profitability position has improved in post-reform period may be accepted to some extent. It was observed that in the public sector banks, the size of NPAs has also been reduced to some extent and quality of services was improved in the post-reform period. The priority sector lending has registered a decline in the deregulation era.

**Profitability**

Varde and Singh (1983)\textsuperscript{12} of National Institute of Bank Management, Pune conducted a number of studies on the profitability of Commercial banks and have complied then in a book titled "profitability of banks like profit management in banks, productivity in banks, profit planning in banks, monitoring profitability of bank branches, measures cost of funds for banks matching revenues and costs of commercial banks and operating cost of rural retail banking.

Varghese, S.K. (1983)\textsuperscript{13} conducted an in depth study on profits and profitability of commercial banks during the decade 1970-79. The major issues analyzed by her are: (i) Has there actually been a declining trend in the profits and profitability of Indian commercial banks in the seventies? (ii) What are main determinants of profits and profitability of the Indian banks during this period? (iii) Are the conventional profit accounting standard adequate to reject a true picture of the financial performance of the Indian banks? and (iv) Are the present systems and procedures of drawing up the balance-sheet and profit and loss accounts adequate to give a true and fair picture of the banks' financial position and if not, what improvement are called for? Owing to data and time constraints, however, the scope of her study was limited to the analysis of profits and profitability of groups of Indian
commercial banks, leaving aside the analysis of financial performance of individual banks.

Raut and Mohanty (1985) attempted to analyze the reasons for declining profitability of a co-operative central bank. The authors used the statistical tool, coefficient of determination in their analysis to study the effect of individual variables on the profitability of the bank. They concluded that the declining trend of profitability could be arrested by increasing the ratio of time deposits in total deposits.

Joshi (1986) has analysed the trend of gross and net profits of all scheduled commercial banks and found that lower capacity for fund management of the banks is due to SLR (Statutory Liquidity Ratio), CRR (Cash Reserve Ratio) and priority sector lending. He found out that there had been lowering yield rate and rising cost rate year by year which contributed a lot to the declining trend in profitability. He viewed that declining demand from the corporate sector for bank funds has serious implications for bank profitability.

Chopra (1987) in her empirical work “Management of Profits, Profitability and Productivity in Public Sector Banking”, studied the emerging trends in the profits and profitability of some selected public sector banks at micro level. She highlighted the need for proper management of both costs as well as earnings in these banks.

Godse, V.T. and Padwal, S.M., (1987) studied the issue of bank profitability under the conditions observed that any emphasis on the increase of the volume of business and proper management of burden would definitely result in enhancing the profitability of commercial banks. They concluded that the key of profitability of Commercial Banks in India are high volume of business (per branch, per employee) and not the expenses (per branch and per employee), which is popularly practiced.
Singh (1987)\textsuperscript{18} has noted that profitability of the Indian banking system has been subject to several stresses and strains due to many exogenous and endogenous factors. The major of them being continuous increase in the SLR, CRR, persistent emphasis on social goals, growing incidence of industrial sickness, rapid branch expansion in rural areas, unfavourable change in the deposit mix and growing incidence of financial disintermediation.

Rao (1989)\textsuperscript{19} made a comparison of business ratios of profit making and loss incurring rural branches of a nationalised bank for the year 1986. He opined the chief reason for less profit is the low volume of business. He suggested that monitoring the break-even business level for the banking sector is of great importance of improving profitability.

Garg (1989)\textsuperscript{20} studied the main determinants of cost, profit and profitability of the banking sector and also observed the inter group differentials of SBI and its subsidiaries, the nationalised banks, foreign banks and private banks. He also studied the impact of monetary policy on bank earnings. He concluded that the profitability of various bank groups excluding foreign banks showed a steeply declining trend during 1977-82. Further, he observed that the operating income of all bank groups increased at a lower rate as compared to operating expenses which resulted in the decline in the profitability.

Panda and Lal (1991)\textsuperscript{21} in their paper attempted to develop certain internal management techniques for improving the profitability of the Indian banking system. The authors have identified productivity, development of funds, quality of advances, information system and organisational set up and branch policy as the most important factors influencing the profitability.
Ramachandran (1992) attempted to trace out the causes for declining profitability of Indian banks and suggested possible measures for arresting this trend. He observed that the main causes are: (a) emphasis on social goal (b) increase in establishment cost (c) blocking funds in sick units (d) compliance to statutory requirement (e) rural branch expansion (f) leakage in income, and (g) poor cash management and others.

Sadare (1992) in his note has briefly analyzed public sector banks, private sector and foreign banks for a period of six years covering 1985 to 1990. He suggested that policy support as well as increasing branch efficiency are important factors for improving the profitability of banks.

Goporia (1992) maintained that if adequate profits have to flow in Indian banks, following priorities will have to be observed: (a) among fund-based operations, the lending operations have to be directed to areas which would maximise profitability and growth, consistent with the long-term objectives of the institutions, (b) to promote non-fund based operations, and (c) charging fees for banks’ services after taking into consideration the cost benefit of service offered.

Vysya Bank (1992) hosted Bank Economists’ Conference at Bangalore, 1991, on ‘Banking for better profitability’. Different experts and eminent persons in banking sectors presented papers on profitability of banking operations with their valuable suggestions for enhancing bank profitability.

Rajagopalan (1993) has given a general view on productivity in banks. He opined that profitability and productivity depends on various factors like reduction of costs, recovery of over-dues, work reorganization, introduction of computers etc. He
also identified that establishment expenses play a key role in determining the level of profit. He viewed that attention should be paid on the staffing pattern in banks.

Singh (1993)\textsuperscript{27} in his paper has given an overall view about profit planning in banks and stressed on the awareness of break-even point to improve the profitability. He concluded that the level of profitability would largely depend on cost consciousness, overall monitoring management, quality of asset management, level on non-fund business and the customer services.

Singh (1993)\textsuperscript{28} in his work on productivity of Indian banks has divided public sector banks into two groups – SBI group and 14 nationalized banks. He has used seventeen indicators to analyse productivity trends of the Indian banking sector and study the inter-group differentials of SBI group and nationalized banks over 1969 to 1985.

Amandeep (1993)\textsuperscript{29} in her study on profitability of commercial banks has attempted to examine the trends in profits and profitability of twenty nationalised commercial banks, with the help of trends analysis, ratio analysis and concentration indices of the selected parameters. The studies focused at identifying factors have significantly contributed towards banks profitability in either direction. Using the multivariate analysis, she concluded that it is the efficient management of the burden believed ‘interest spread’ element, which plays a major role in determining the profitability of commercial banks. In spite of lack of control of few determinants of burden, it is inferred that bank profitability can significantly be enhanced by judicious management of the burden.

Chidambaram and Alamelu (1994)\textsuperscript{30} studied the problem of declining profit margin in Indian public sector banks as compared to their private sector counterparts.
It was observed that in spite of similar social obligations, almost all the private sector banks have been registering both high profits and high rate of growth with respect to deposits, advances and reserves as compared to public sector banks. The regional orientation, better customer service, proper monitoring of advances and appropriate marketing strategies are the secrets behind the success of private sector banks.

Satyanarayana (1995)\textsuperscript{31} after ascertaining the exact position of the banks in the post reforms period, analysed the strategies that the banks should adopt to improve their capital base. It was emphasized that after reforms, a new basis of classifying the public sector banks, depending on profitability level, has emerged. The study revealed that in 1994 out of total 27 public sector banks, fifteen belonged to ‘A’ category (those banks, which have significant income to earn net profits after making necessary provisions and contingencies). Seven banks were operating in ‘B’ category (those banks, which after operating profits have not sufficient funds to provide for the provision, thereby incurring net losses) and the remaining were placed in the ‘C’ category (those banks, which were unable to earn significant income to enjoy sufficient operating profits). Apart from studying the profitability of above mentioned groups of banks, capital adequacy position and other balance sheet trends were also discussed. Further, some short-term and long-term strategies for enhancing the profitability level were suggested.

Kumar (1998)\textsuperscript{32}, in his paper on profitability of Indian commercial banks has used the technique of stepwise Multiple Discriminate Analysis to identify the most critical profitability ratios relating to Indian banks. The sample comprise of 51 banks, 26 public sector banks and 25 private sector banks. 12 ratios representing spread and burden and their components were taken, in addition to two decomposed ratios of
equity multiplier, totalling 14 ratios/independent variables. The data related to the year 1994-95. The study identified only for variables among the 14 variables as the significant discriminators of profitability (measure by Return on Assets). They were: Earning Assets/Shareholder’s Equity, Spread/Working Funds, Non-Interest Expenditure/Working Fund and Operating Expenses/Total Income. The canonical correlation of the discriminate function was 0.8139 which indicated a fairly strong relationship between the groups (non-profitable bank group and profitable group) and the discrimination function. The classification accuracy for the analysis sample was 98.04 per cent.

Deb (1998)\(^{33}\) critically studied the growth of banking system in India covering the period from 1966 to 1987. The analysis revealed that the structure of the banking system changed considerably over the years. It was further pointed out that the quantitative growth of the public sector banks was no doubt significant in some of the areas, but qualitative improvement is not significant.

Bhatia & Verma (1998-99)\(^ {34}\) maintained that profitability of bank depends both on exogenous variables (i.e., policy determined variables such as service requirements and direct credit programmes) and on endogenous variables such as composition of deposits, establishment expenses, burden and spread etc., The study used the technique of stepwise multiple regression with the dependent variable as net profit as percentage of working funds. The study led to the conclusion that: (i) Net spread (interest spread minus burden) influenced, positively and significantly, the profitability of banks. (ii) Priority sector advances (in absolute term for nationalized banks) and as ratio of total advances (for SBI group of banks) influenced negatively the profitability of public sector banks. The same was with fixed/current deposit ratio and establishment expenses: and (iii) although credit-deposit ratio was found to be
positively influencing profitability, its impact was statistically non-significant. The study suggested that burden ratios can be reduced by banks by way of introducing new technology for superior operational efficiency and by observing strict cost control at all levels. They opined the need of mobilizing more of current and saving deposits with banks and a lesser dependence on term deposits.

Ganesan (2001)\textsuperscript{35} has selected State Bank Group (8 units) and 19 nationalised banks as sample to identify the determination of profit and profitability. The empirical estimation of profit function mode he had used multiple regression technique on data relating to the sample banks for period 1969-1999. The study had shown that interest cost, interest income, other income, deposit per branch, credit total assets, proportion of priority sector advances and interest income loss were the significant determinants of profit and profitability of Indian public sector banks. The analysis found that the average establishment cost positively contributed to the profitability but it adversely affected the net profit of the public sector banks. The study has also identified the fact that banking sector reforms and individual banks policies towards directed investments and direct credit programmes had played a significant role in improving profit and profitability of banking sector.

Ganeshan (2002)\textsuperscript{36} reveals by an empirical establishment of profit function that interest cost, interest income, deposits per branch, credit to total assets, proportion of priority sector advances & interest income loss are significant determinants of the profits & profitability of Indian public sector banks.

D'Souza (2002)\textsuperscript{37} found that the efficiency of the public sector banks has declined during the 1990s when measured by the spread/working fund ratio. He observed that though the profitability of the public sector banks did improve relative
to the private and foreign banks, they have lost ground in their ability to attract deposits at favourable interest rates, in their slow technological up-gradation, and in their staffing and employment practices, which have implications for their longer-term profitability.

Chaudhuri (2002)\textsuperscript{38} examined some important relevant issues relating to growth and profitability in the public sector banks for the year 1995-2001. It is opined that the public sector banks are facing triple jeopardy. First they are losing market share, second their profitability is being seriously squeezed and lastly their balance sheets are not strong and their sovereign support, which had buttressed them so far, is becoming open to question. The reasons for this less than enviable condition of the public sector banks are many, but a principal operative factor derives form the nature of their ownership and what that translates in terms of goal and priorities. However, it was concluded that the public sector banks in India are neither very strong nor very weak. But they do not have any further capacity to bear the burden of pursuing government policies.

Sinha (2006)\textsuperscript{39} attempt to compare the domestic commercial banks (for the reform period) in respect of their ability to generate operating profit which is reflected in the technical efficiency scores. The study excluded the foreign commercial banks from the analysis. The period of analysis is from 1998-99 to 2002-03. In all, 30 Indian commercial banks (20 public sector and 10 private sector) were included in the analysis. The study considers five efficiency indicators: (1) operating profits in absolute terms; (2) operating profit in terms of operating expenses (3) operating profit in terms of total asset (4) operating profit per branch and (5) operating profit per employee. The results reveal that the commercial banks have diverged in terms of technical and scale efficiency in 2000-01 as compared to 1998-99. However, the
trend was somewhat reversed in 2002-03. The observed private sector banks have higher mean technical efficiency scores as compared to their public sector counterparts. The study also indicates that for 1998-99 and 2002-03, the observed public sector commercial banks have higher mean scale efficiency scores than the observed private sector commercial banks.

Mittal and Dhade (2007) study comparative performances of PSBs vis-à-vis foreign banks; besides these two categories of banks, the study also includes private sector banks. The parameters selected for evaluation of performance of various categories of banks are profitability and productivity. The time period for the performance analysis has been chosen as 1999-2000 to 2003-04 to find out the impact of government's decontrolled and liberalized policies on public sector banks as compared to other categories of banks like private sector banks and foreign banks. The variables studied are interest paid, interest earned, total deposits and advances, non operating income and expenses, number of employees, number of branches, establishment expenses etc. The authors found that the public sector banks are less profitable than the private sector and foreign banks in terms of overall profitability nevertheless their profitability improved over the last 5 years. Further, foreign banks top the list in terms of net profitability. The study findings further suggest that public sector banks are ranked second after the foreign banks in terms of the spread ratio but they have higher burden ratios which make them less profitable as compared to the other categories of banks. While there is no remarkable difference in the spread ratio, there is a significant difference in burden ratio among the public sector and foreign banks and also the private sector peers. The key to profitability for the public sector banks is increased productivity. Those public sector banks that have been able to increase the productivity found themselves at par with the private sector banks. The
authors also found that the public sector banks and the old private sector banks lagged far behind their competitors in terms of both productivity and profitability with the exception of the State bank of India and its associates. To improve and bring the performances of the PSBs at the level of their peers, the authors suggest a three-point program that includes: Reducing overstaffing, forge strategic alliance with the rural regional banks to open up rural branches and increased use of technology for improved products and services for the same.

Kalluru and Bhat (2008) extend further insights into the post-reforms performances of these different categories of banks by examining their profitability determinants, employing fixed and random effects models for an unbalanced panel data of 87 commercial banks for a much longer time horizon spanning from 1992 to 2006. The fixed effects model takes into account the firm-specific effect while the random effects model considers the time effect. The study probes the reasons for differences in profitability of banks across different groups, and that to what extent, do these differences in bank’s profitability fall out of variations in internal factors that are under the control of bank management and to what extent, do external and political factors influence the financial performance of these banks (group). They find a positive relationship between bank profitability and capitalization in ROA specification. An analysis of trend of non-interest income suggests that banks are no longer concentrating on only traditional lending and borrowing of interest related activities but are also increasing their exposure to the lucrative fee-based activities. The study further finds that loans to assets coefficient is positive and statistically significant in all the groups, except in public sector banks group which could be due to higher levels of non-performing loans, higher credit risk due to obligating priority
sector lending, lesser interest rates and income comparing to private domestic and foreign banks.

Ketkar and Ketkar (2008)\textsuperscript{42} investigated the aspect whether the "Ownership" effect has for long been a subject of much debate among researchers and analysts as to whether it has an effect on a bank's performance. They study a sample of all commercial banks in India between 1997 and 2004. Using Data Envelopment Analysis (DEA), they find that the relative efficiency of banks by ownership does not critically depend upon whether deposits are treated as an input (intermediation approach) or output (production approach). They find that excessive bank investment in government securities has negatively impacted bank efficiency; it also shows greater risk-aversion on part of PSBs. Turning to banks' profitability, the authors find that efficiency scores and net interest spreads have a positive impact, while non-performing assets and priority sector lending have the opposite impact. Thus, the liberalization and deregulation of banks have raised efficiency scores over time of all banks in India regardless of their ownership. These gains in efficiency have also improved bank profitability, the study highlights.

**Branch Expansion**

Ranga Swamy (1985)\textsuperscript{43} made a study on banking industry in public sector. Much importance was given to branch expansion and to the extent to which the objectives of nationalisation were also made on housing finance and consumption loans.

**NPA Management**

Atul Mohan, Puneet Kapoor (1992)\textsuperscript{44} in their study detailed about what Income Recognition norm is and explained the various situations, how non-
performing assets can be converted into performing assets. He also brought out the norms and conditions stipulated for income recognition and non-performing assets.

Shinde, S.R. and Kaveri, V.S. (1992)\textsuperscript{45} in their paper on “Management of Non-Performing Advances” have studied about non-performing assets and outlined a brief outcome of the programme conducted on “Management of Non-Performing Advances”, by National Institute of Bank Management. The outcome was to prevent any advance becoming non-performing asset, it is necessary to identify early warning signals and take timely follow-up measures, apart from legal remedies, the non-legal remedies include compromise proposals, role of BIFR in respect of non-performing assets, encouraging mergers and acquisitions, debt discounting exchange of debt for debt or swapping of debts, discounting of decrees, write off of loans, use of the State Government machinery etc., The study also touched upon the recommendations made by Narasimham Committee.

Ganti Subramanyam (1995)\textsuperscript{46} stressed the direct and indirect burden on banks, with the introduction of risk capital norm, as it will have a direct effect on banks loan interest rates and the pricing of its products. He highlighted how indirectly banks have to reduce high-risk assets and move to less risky investments, such as government securities, leading to credit crunch to the private sector. He pointed out that the risk based capital ratios will become tools for assessing banks capital position.

Prashanta Athma (1996)\textsuperscript{47} in a Ph.D. thesis “Performance of Public Sector Commercial Banks - A Case Study of S.B.H.” critically studied branch expansion, factors affecting resource mobilisation, deployment of funds, customer service and profitability. She also studied the ratio of loss making rural branches to total rural
branches. In addition, she studied management of NPAs and suggested measures to improve the overall efficiency.

Pannir Selvam Committee (1999)\textsuperscript{48} pointed out the reasons for the growth of NPAs and suggested measures for recovery of banks dues, thereby reducing NPAs. The Committee also recommended the banks to upgrade their techniques of credit appraisal and credit monitoring by setting up of recovery cells.

Usha Arora (2000)\textsuperscript{49} in a study “NPA Management in the Indian Environment” brings out of the objectives of prudential norms namely to know the actual financial health of the bank and to install transparency in the balance sheet, the need for three stages in management of NPAs and stresses the need for curbing the incidence of NPAs amongst new loans sanctioned and granted by branches, professional appraisals and timely delivery of credit, credit supervision and SWOT analysis of securities. Further management of NPAs leads to Ripple Effect, which identifies the performing asset becoming into non-performing. Ripple Effect is a process in which a trend or situation spreads outward from its initial location to affect areas distant from it. NPA management is linked to return on assets and return on equity.

Sharma, S.G. \textit{et al.}, (2000)\textsuperscript{50} deals with a quantitative analysis of NPAs in the selected banks in the private and public sector. The study is based on basically on the secondary data. SBI is one of the selected banks under study in which improvement in quality of assets and comparatively a lower variability in the NPAs have been observed. The study stands with the conclusion that banks have to be efficient and regulated irrespective of their being publicly or privately owned. In order to fulfil this objective, the banks are suggested to use sophisticated methods of risk management.
Brinda Jagirdar (2002) highlighted the need for capital adequacy norm and the new framework including Tier I, Tier II and Tier III capital. The study analysed the expected impact of the new regulation on capital requirements and profitability of commercial banks.

Rita Rai (2002) brought out the three phases of capitalisation of Nationalised Banks by the Government, namely in the early 1980’s to enhance the profitability and profits of the bank and capital was provided to the weak banks. Secondly, after the introduction of the norms capital was infused into public sector banks to maintain the required CAR norm. In the third phase, capital was provided only to the weaker banks. She also studied how banks were permitted to raise the capital from market and new pillars approach to capital adequacy, constraints faced by and how to overcome them.

Vanne Rajan, T. (2006) focused on the problems of NPAs in public sector banks as compared to other banks. The study is conducted with the objective of examining the impact of independent variables on the profitability of public sector banks and to analyse the impact of NPAs on productivity and profitability of public sector banks. The significant revelation of the study is that NPAs have a direct bearing on the banks profitability, liquidity and equity.

**Human Resources Management**

Chawla (1993) in his paper on “Training and Skill Development”, had stated that, in the new competitive environment in the financial sector, quality of customer service, efficiency and productivity are important and this would require banks management’s to have a re-look at the quality of human resources and increasingly be more and more challenging for employee training.
Deposit Mobilisation

Hukku (1977) in a study “Bank Deposits in India” studied the role of deposits in commercial banks, growth of deposits factors affecting the growth of deposits, changing rates of interest and its impact of deposits.

Gangadham, S. (1994) in his “Bank Deposits Swell, Disbursals Slow Down” has studied variations in selected items of commercial banks. He says scheduled commercial banks have an impressive record in deposit mobilisation but a conspicuous failure to boost their advances portfolio for the year 1993-94. The scale of advances to commercial sector has been inadequate, as the banks have adopted a cautious policy with regard to lending operation due to stricter provisioning and capital adequacy norms.

Bilgrami (2000) was to examine the credit-deposit trends in the public sector banks in the pre-and post-economic scenario. The credit-deposit ratio, despite a significant reduction in cash-reserve ratio and statutory-liquidity ratio in the post-reform period, exhibited a declining trend. Further, it was observed that the level of profitability, efficiency and customer services in the public sector banks have deteriorated in the post-reform period. The main reason behind the sluggish growth rate of bank deposits during the post-reform period is the growth of non-banking financial intermediaries including financial companies, mutual funds, stock markets and private sector banks. The entry of new private and foreign banks and their quality of customer services have also affected the level of deposits in the public sector banks.

Customer Services

Private Banks (including Foreign Banks) highlighted an overview of customer services and financial performance of commercial banks in India. For maximising the banks' profitability, customer was treated as the focal point assuming that the improvement in the customer service has relation with the profitability of banks. Many other aspects such as front office services like cash deposit, cash withdrawal, demand drafts, bank office services like opening an account, cheque book service, safe deposit and locker services and outside bank office services such as Internet Banking, Phone Banking, Automatic Tellers Machine (ATM) and Credit Card Services have been dealt with.

Ashok Kumar, M. et al. (2006) studied the customer satisfaction in banks with reference to State Bank of India and Indian Bank which are public sector banks. The study is confined to assessing the satisfaction of customers in the public sector banks with regard to the provision of physical facilities besides the quality of services. The researcher opined banks are the mart of the world and nerve centres of economic prosperity besides the parameters of nation's property. The study is confined to a sample of 150 respondents from the universe consisting of 2 lakhs as its population. It is suggesting that service delivery and customer delight are the most influencing issues in the sustainability of banking business and influencing factor of profitability. Therefore the study concludes that customer service and satisfaction ensures commercial viability and profitability of banks in the competitive environment prevailing in the banking sector in the post-reforms scenario.

General Aspects of Banking Sector

The Report of the Banking Commission of 1972 inquired into the existing structure of banking system, expansion of branches, size and area of operations, cost of capital and management policies of commercial banks.
The Report of the Chakravarthy Committee to review the working of Monetary System (RBI 1985)\textsuperscript{61} looked into the relationship between then deposits and advances, structure of commercial banks, branch expansion, credit deposit ratio, administered rates of interest and impact of monetary policy on the banks operation and suggested to device innovative schemes to improve efficiency.

S.K. Basu (1985)\textsuperscript{62} in a “A Review of Current Banking Theory and Practice” clearly brings out the development of banking industry and changing role of commercial banking.

The RBI appointed the Talwar Committee in 1977\textsuperscript{63} to examine the customer services in banks. The major recommendations of the Committee related to providing instant credit to outstation cheques up to Rs.2,500 to make good for loss of interest on account of delay made by the banker and every office must have an enquiry counter at the entrance to attend to the customer.

Anand (1992)\textsuperscript{64} in his Article calculated the economies of priority sector lending and in view of that, he looked into the question whether priority sector advances are the main cause of low profitability of banks or not. He concluded that fixation of concessional rates at very low levels is not advisable as this often leads to the diversion of loans away from agriculture and also cause inflation. However, the analysis revealed that priority sector advances have not been and are not a drag on profitability.

Patel and Khankhoje (1993)\textsuperscript{65} in their study discussed basic issues pertaining to rural banking in the context of financial sector reforms. It was observed that the operations of the National Co-operative Bank of India could have perceptible repercussions on the operations of the commercial banks in the rural sector. It was
concluded that closure of rural branches was not a viable solution while thinking about restructuring of rural banks. The issue concerning rural banking basically emerges from the fact that its futuristic role is both indispensable and challenging. Hence, clarity and broad consensus on certain aspects of the role and functioning of rural banking become essential.

Jadhav and Ajit (1996) analysed the role of banks in economic development of India during the last five decades. It is observed that despite the overall progress made by banking system in terms of functional and geographical coverage doubts arise about the viability of the banking system in the coming period. Though financial sector reforms have enabled banks in India to clear their balance sheets and improve their functioning yet they face challenges especially in the financial services like leasing, merchant banking, mutual funds, and money market and in government securities.

Gangadhar (1997) evaluated private and public commercial banks in terms of banking services, banking habits and introduction of new techniques and innovations in credit deployment.

The study of Sugan, G.C. Jain et al. (1997), is confined to the private sector banks in the State of Rajasthan. Though the study is comprehensive in its coverage of different groups of banks geographically, it is regional in its scope. Moreover for evaluation of the banks, the public sector is given an exclusive focus in the framework of very few traditional parameters like deposits, advances, credit deposit ratio etc.

G.Narayan(1998) highlighted the difficulties, achievements and accomplishments of Andhra bank, since its inception.
Vasudevan Committee (1999)\textsuperscript{70} highlighted on the use of standard procedures to prevent data tampering during transmission, computerization of Government transactions, legal framework for electronic banking.

V.K. Chopra (2001)\textsuperscript{71} highlighted post VRS scenario, shrinking of profitability, new products like tele-banking, mobile banking, internet banking, e-commerce related products and non-performing assets. He pointed out the synergy of mergers and acquisitions and some of the challenges before the Indian Public Sector Banks.

Nag and Das (2002)\textsuperscript{72} attempt to find empirical evidence for the credit crunch that might have been aggravated by the application of capital standards. The research confined the analysis to the public sector banks only as they account for more than 75 per cent of total credit flow to the commercial sector. The authors assert that their research findings have general validity for the sector.

Sharma, M.C. (2006)\textsuperscript{73} viewed that globally the banking industry has evolved dramatically, driven by the changes in the business and economic environment, in legislation, in competitive pressures and in enabling technologies. In view of the scenario the business in the regions is felt needed in the Indian banking sector. Otherwise the viability and sustainability of banks is thought unassured. It is also observed that profitability analysis and customers, products and channels is possible through business intelligence which too helps in right pricing strategies to result in reasonable profit margins.

**Reforms**

Narasimham Committee in their Report-I (1991),\textsuperscript{74} emphasised the role to be played by the financial system in mobilizing savings and its deployment, two
decades of progress, interest rates, creation of Asset Reconstruction Fund and directed investment and credit programmes. They also covered the organization, methods and procedures in banks, money and capital market institutions, financial institutions and legislative measures. The Report also stressed the need for capital fund in relation to the risk weighted assets, proper system of income recognition and provisioning and asset classification as a fundamental, for the strength and stability of the banking system.

Reddy, C.R.(1994)\textsuperscript{75} analysed the intricacies and issues in banking sector reforms. It is emphasized that the speedier growth of banking is a pre-requisite for socio-economic development of the country. Moreover, it is stated that to achieve the requisites for the effective functioning of the banking sector with higher profits and more efficiency, reforms are inevitable. It is felt necessary that the viability of the system should be maintained. The study concludes that the banking sector reforms would improve the health and competitive spirit with the steps being taken to open up the Indian economy and enable the public sector to increase opportunities for Indian trade, industry and finance.

Subba Rao and Augustine (1998)\textsuperscript{76} revealed that the portfolio behaviour of commercial banks has undergone radical changes with the introduction of financial sector reforms. As compared to the pre-reform period the credit-deposit ratio in the post-reform period has come down further. The study revealed that the distribution of bank credit to industry (medium and large) classified by size of credit limits was highly skewed. It was observed that the share of credit with limit up to Rs.1 crore gradually declined during the period 1991-95. In contrast, the share of units with credit limits up to or above Rs.10 crores gradually increased during the period under reference. The data on outstanding credit of commercial banks classified by
occupation and interest ranges revealed that more than 75 per cent of credit to
industry was contracted at interest rate exceeding 15 per cent in each of the years.
Further, it was observed that the shares of the bank borrowing in total companies’
borrowings have declined over the year.

Narasimham, M.(1998)\textsuperscript{77} in his second report, recommended strengthening of
Capital adequacy, improved asset quality, structural issues such as nurturing of weak
banks, mergers between strong banks/financial institutions, withdrawal of RBI from
primary markets in 91 days treasury bills, professionalising and depolitisising of bank
boards, and deposit insurance schemes to be based on Capital Adequacy, Asset
Quality, Management, Earnings, Liquidity and Systems (CAMELS) ratings awarded
by the RBI to banks.

Abha Prasad (1999)\textsuperscript{78} in a study entitled “Financial Sector Reforms – A Case
Study of State Bank of Bikanur and Jaipur” (SBBJ) emphasized on financial sector
reforms related to banking sector, their impact on economy, SBBJ and on Banking
Sector and on the future operations for the SBBJ, Banking Sector and economy.

Verma Committee (1999)\textsuperscript{79} for the time being ruled out mergers, acquisitions
and privatisation and recommended for cost reduction by reducing staff strength by
Voluntary Retirement Schemes (VRS), Wage Freeze, Asset Management Company
for take over of NPAs from banks and rationalization of branches. It identified three
banks as weak – Indian Bank, UCO Bank and United Bank of India and developed 7
parameters for assessing the banks strength in the areas of solvency, profitability and
earning capacity. It also assessed the cost of restructuring the weak banks.
Nettime and Kuruba (2000) observed that the pace of reforms in banking sector in India is definitely encouraging and giving positive signals of structural changes in the financial sector. However, it was opined that the reforms would be successful only if the level of NPAs there is need for legal reforms. It is the attitude and efficiency of the banking authorities, which have to go a long way in making the banking reforms operationally and functionally effective.

Errol D'Souza (2000) brought out, the need for regulatory reforms in Banking System, and focused on current phase of reforms-prudential regulations and covered economic deregulations, moral hazards in the financial market, liberal credit regime and credit-rationing regime.

Shankar Acharya (2001) in “A vision for banking” highlights the need for privatization of public sector banks as the reforms could not tackle adequately the structural problem of public sector banking, as Gross Non Performing Assets in relation to commercial advances were as high as 14 per cent as compare to 4 per cent for the new private sector banks and 7 per cent for foreign banks. He stresses that the public sector banks should be professionally managed and be transformed into efficient private sector banks as they promise a rising curve of efficiency, confidence and growth.

Bhide, Prasad and Ghosh (2001) examine the process of banking sector reforms in India. They note that the beneficial impact to the financial system is consequent upon the reforms and highlights the current weaknesses in the banking system. Against this background, the paper identifies the emerging challenges and discusses ways in which they could be tackled. These include emerging structure of new financial system, capital adequacy, bank recapitalisation, pro-cyclist of prudential
norms, treatment of weak banks, NPAs, legal framework, transparency and
disclosure, potential conflicts as owner/supervisor, regulation and supervision,
universal banking, risk management, capital account liberalisation, corporate
governance, deposit insurance, and finally issues relating to cooperative banking.

Basman Amar A.I. Dalayeen (2002) \(^8\) studied "Impact of Financial Sector
Reforms in Indian Banking – A Case Study of SBI" stressed on financial sector
reforms I and II and impact of financial sector reforms on Indian Banking Sector in
general and SBI in particular. The study also enlightened on the future options for the
banking sector with reference to data warehousing and data mining through
computerization, ATM, Electronic Fund Transfer, Point of Scale, Very Small
Aperture Terminals and Network.

Bhide, Prasad and Ghosh (2002) \(^8\) while evaluating the banking sector reforms
in India observed that there has been a commendable improvement in the profitability
of the public sector banking system, measured in terms of operating profits. It was
pointed out that the inter-mediation process has also improved, as is evident from the
ratio of net-interest income to total assets of public sector banks. The profile of assets
portfolio and the extent of the net non-performing loans as percentage to total assets
also exhibited improvement during the period 1992-93 to 1999-2000. According to
the study externality of the reforms process has been the building up of the
institutional architecture in terms of market and creation of enabling environment
through technological and legal infrastructure and improving the managerial
competency. The debt recovery process, inefficient legal system and inadequate risk
management technique etc. are the major weaknesses. It was observed that the
reforms could not be entirely painless.
Research Gap

From the above review of literature, it is evident that the studies focused on various aspects of banking sector in India that include financial performance, profitability, deposits mobilisation, branch expansion, customer service, general aspects of banking and reforms. Though majority of the studies focused on financial performance and profitability of banks, there were not many studies relating to profitability analysis during various phases of reforms. A few studies are available on individual bank-wise analysis in India, but studies on group-wise analysis were not found. It is in this context, study abridges the gap by studying the impact of banking sector reforms on the profitability of commercial banks in India with reference to select public and private sector banks in phase one and phase two.

OBJECTIVES OF THE STUDY

The main objective of the study is to examine the profitability of commercial banks in India in the backdrop of banking sector reforms. More specifically, the objectives of the study are:

1. To focus on horizons and growth directions of banking in India.
2. To examine the role and problems of banking sector in India.
3. To analyse the impact of reforms on banking sector in India with special reference to profitability.
4. To compare the profitability of select public and private sector banks in India.
5. To examine the issues involved and challenges faced by the banks in India in improving their profitability, and thereby
6. To offer suitable suggestions and policy recommendations based on the findings of the study to improve the profitability of public and private sector banks in India.
HYPOTHESES OF THE STUDY

1. There is no significant difference in profitability among select banks during reforms period.

2. Not all select variables indicating profitability have a significant influence on profitability of the select banks.

3. There is no significant difference in the profitability of select banks in the Phase I and Phase II of banking sector reforms.

Accordingly various sub-hypotheses have been formulated for each of the variables used in the study. They have been mentioned at relevant places.

SELECTION OF THE SAMPLING

The study is conducted as a sample study. For the purpose of the study, the sample has been drawn based on convenience sampling covering both public and private sector banks. The sample has been drawn from Public Sector Banks and Old Private Sector Banks as they were existing prior to initiating reforms. Three banks from each sector have been selected for the study. These include State Bank of India, Canara Bank, and Vijaya Bank from public sector and ING Vysya Bank, Karur Vysya Bank and Lakshmi Vilas Bank from the private sector respectively. New private sector banks are not taken, as they do not exist before reforms period. Foreign banks are also not included in the study as the banks are having limited branches and do not cover wide area. Hence, only public sector banks and old private sector banks are taken for the purpose of the study for rightly gauging the intensity of reforms on profitability in the two dominant and competing sectors of the Indian Banking. Broadly the said banks are selected for the micro study both from the public sector and private sector basically on the basis of bank's profile. The banks are categorized
as high profile (SBI, ING Vysya Bank), medium profile (Canara Bank and Karur Vysya Bank) and low profile (Vijaya Bank and Lakshmi Vilas Bank) based on total assets value. Further with respect to the selection of individual public sector banks, it is justified on the ground that the State Bank of India belongs to the SBI Group, Canara Bank comes under the group of 14 banks nationalised in 1969 and the Vijaya Bank comes under the group of 6 Banks nationalised in the year 1980.

PERIOD OF STUDY

The study covers a period of eighteen years, i.e., from 1991-92 to 2008-09. The beginning of the study period (1991-92) coincides with the impact of implementation of first phase of banking sector reforms in the country. Though the second phase of reforms are implemented in the year 1998-99 to show its impact some gestation period is taken. Therefore, for analysis the study period starts with 1991-92 for the first phase of reforms and 2000-01 for the second phase of reforms which implemented by the end of 1998-99.

SOURCES OF DATA

The study is extensively based on secondary data. Primary data are the opinions of officials and staff of select banks on the trends on the variables have been used wherever needed. The sources of the secondary data are RBI Publications - Report on Trend and Progress of Banking in India, Report on Currency and Finance, Statistical Tables relating to Banks in India, Handbook of Statistics on the Indian Economy, Bulletins, IBA Publications – Indian Banking Year Books, Annual and monthly Bulletins, Performance Highlights of Public Sector Banks, Private Sector Banks and Foreign Banks, Annual Reports of Select Banks for the period from 1991-92 to 2008-09, Reports of Narasimham Committee, Journals, Books and Internet.
Secondary data have been collected by visiting libraries and banks. The primary data are collected through interaction with bank officials and staff through an unstructured schedule of questions for their resourceful reflections.

**SCOPE OF THE STUDY**

The study on banking sector reforms and profitability is very exhaustive and thus the study is limited to outlining the banking sector reforms as envisaged by the Narasimham Committee and the profitability is analysed by certain select indicators popularly used by the banks. Further, the study is limited to select banks and only post reform period is considered for the analysis.

**TOOLS AND TECHNIQUES OF ANALYSIS**

For the purpose of analysis and to facilitate interpretation, statistical tools like percentages, averages, compound annual growth rates, coefficient of variance and Pearson Coefficient of Correlation are used. ANOVA, Tukey HSD Test, Multiple Regression Analysis and Discriminant Analysis are used for testing the hypothesis. SPSS (Windows Version 16.0) is used for the purpose of extensive analysis.

(i) **Simple Growth Rate**: It merely gives the percent increase over the previous year i.e.

\[ g = \left( \frac{K_t - K_{t-1}}{K_{t-1}} \right) \times 100 \]

\( g \) = Growth Rate,

\( K_t, K_{t-1} \) are the values of variables, and

\( K \) in year’s t and t-1 respectively

(ii) **Compound Annual Growth Rate (CAGR/CARG)**: It works out change for a given period on the basis of the base year and the end year values, i.e.,
\[
g = \left( \frac{K_1}{K_0} \right)^{1/t} - 1 \times 100
\]

Where \( K_1 \) and \( K_0 \) represents the values of variables at the end and basic year respectively,

'\( t \) is the time period between the base year and end year, and

'\( g \) represents the compound growth rate.

iii) **Mean (\( \bar{X} \))**: The mean value is obtained by adding together all the items and by dividing this total by the number of items.

\[
\bar{X} = \frac{X_1 + X_2 + X_3 + \ldots + X_n}{N} = \frac{X_n}{N}
\]

Where, \( \bar{X} = \) Arithmetic value
\( \Sigma X = \) Sum of all the variables
\( N = \) Number of variables

iv) **Standard Deviation**: Standard Deviation measures the absolute dispersion. A small standard deviation means a high degree of uniformity of the observations as well as homogeneity of series, a large standard deviation means just the opposite. It may be calculated as follows:

\[
\sigma = \sqrt{\frac{\Sigma x^2}{N}} \quad x = (X - \bar{X})
\]

v) **Co-efficient of Variation (CV)**: Co-efficient of variation is a situation where we want to compare the variability of two or more than two series. A high variation indicates less consistency and less variation indicates more uniformity.

\[
C.V. = \frac{\sigma}{\bar{X}} \times 100
\]

\( \sigma = \) Standard Deviations of the Variables
\( \bar{X} = \) Mean Value of Variables

vi) **Co-Efficient of Correlation**; It is a statistical device, which helps us in analyzing the co-variation between two or more series of variables. The co-efficient of correlation is denoted by the symbol 'r', The formula for computing 'r' which was practiced by "Karl Pearson" is:
\[ r = \frac{\sum xy}{N \sigma_x \sigma_y} \]

where \( x = (X - \overline{X}) \), \( y = (Y - \overline{Y}) \)

\( \sigma_x \) = Standard Deviation of Series X
\( \sigma_y \) = Standard Deviation of Series Y
\( N \) = Number pairs or observations

\( r \) = The Correlation Co-efficient.

The value of correlation co-efficient, which is obtained by the above formula, shall always lie between ±1. If \( r = +1 \) it means there is a perfect positive correlation between the variables. When \( r = -1 \), there is a perfect negative correlation between the variables. When \( r = 0 \) it means there is no relationship between the two variables.

vii) t-test of a correlation co-efficient: It is assumed that the two series of variables originate from a bivariate normal distribution, and that the relationship is linear. To test the null hypothesis that the population value of \( 'r' \) is zero, the test static.

\[ t = \frac{r}{\sqrt{1 - r^2}} \times \sqrt{n - 2} \]

is calculated and this follows students’ t - distribution with (n-2)degrees of freedom. The test will normally two-tailed but in certain cases would be one tailed.

viii) t-test for comparing two means: t-test is a technique used to test the hypothesis that the mean scores on some interval-scaled variable are significantly different for two samples or groups. To use the t-test for differences of means, we assume the variances of the two populations or groups are equal.

The null hypothesis about differences between groups is normally stated as \( \mu_1 = \mu_2 \). In most cases comparisons are between two sample means. \( (\overline{X}_1 - \overline{X}_2) \). A verbal expression of the formula for \( t \) is

\[ t = \frac{\text{Mean 1}-\text{Mean 2}}{\text{Variability of random means}} \]

Thus, the t-value is a ratio with the information about the difference between means in the numerator and the random error in the denominator. To calculate \( t \), the following formula is used

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where $\bar{X}_1$ = mean for group 1

$\bar{X}_2$ = mean for group 2

$ \frac{S_{X_1} - X_2}{S_{X_1} - X_2} = $ pooled, or combined, standard error of difference of means.

A pooled estimate of the standard error is an estimate of the standard error based on the assumption that variances of both groups (populations) are equal. To calculate the pooled standard error of the difference between means of independent samples, we use the formula

$$S_{X_1 - X_2} = \sqrt{\frac{(n_1 - 1)S^2_1 + (n_2 - 1)S^2_2}{n_1 + n_2 - 2}} \left(\frac{1}{n_1} + \frac{1}{n_2}\right)$$

Where $S^2_1 = $ variance of group 1

$S^2_2 = $ variance of group 2

$n_1 = $ sample size of group 1

$n_2 = $ sample size of group 2

In a test of two means, degrees of freedom are calculated as follows:

Degrees of freedom (d. f.) = n - k

Where $n = n_1 + n_2$

$K = $ number of groups.

ix) Multiple Regression Analysis: It is a technique of analysing the data, which simultaneously investigate the effect of two or more independent variables on a dependent variable.

The Multiple Regression takes the form of

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots + b_kX_k$$

Where $Y$ is the dependent variable, which is to be predicted; $X_1, X_2, X_3, X_4, \ldots, X_k$ are the $K$ known variables on which the predictions are to be based and $a, b_1, b_2, b_3, b_4, \ldots, b_k$ are parameters, the values of which are to be determined by the method of least squares.
The coefficient of multiple determination (R²) for the multiple regression can be calculated by the following formula.

\[ R^2 = \frac{\sum (Y_i - \bar{Y})^2 - \sum (\hat{Y}_i - \bar{Y})^2}{(Y_i - \bar{Y})^2} \]

Where R² is coefficient of determination
\( Y_i = \) Value of \( i^{th} \) item in \( Y \) series.
\( \bar{Y} = \) mean of the \( Y \) series.
\( \hat{Y} = \) Computed value of \( i^{th} \) item in \( Y \) series on the basis of regression.

To overcome the problem of tedious calculations involved in multiple regression analysis, computers which support Statistical Packages such as SPSS, Statistica, Stat soft etc., are generally used. The use of computers facilitate enormously as several independent variables can be handled. We can ascertain whether adding another independent variable will improve results or not. We can see the magnitude of \( R^2 \), which indicates what proportion of the variation in the dependent variable is explained by the independent variables.

**x) Analysis of Variance (ANOVA)** is a collection of statistical models, and their associated procedures, in which the observed variance is partitioned into components due to different explanatory variables. ANOVA gives a statistical test of whether the means of several groups are all equal.

**The F-test:** The F-test is used for comparisons of the components of the total deviation. For example, in one-way, or single-factor ANOVA, statistical significance is tested for by comparing the F-test statistic to the F-distribution with \( I-1, n_f-1 \) degrees of freedom. Using the F-distribution is a natural candidate because the test statistic is the quotient of two mean sums of squares which have a chi-square distribution.

\[ F = \frac{\text{Variance of the group means}}{\text{Mean of the within-group variances}} \]

\[ F^* = \frac{\text{MSTR}}{\text{MSE}} \]

Where:
xi) Canonical Analysis: Canonical analysis is a multivariate technique which is concerned with determining the relationships between groups of variables in a data set. The data set is split into two groups, let's call these groups X and Y, based on some common characteristics. The purpose of Canonical analysis is then to find the relationship between X and Y, i.e. can some form of X represent Y. It works by finding the linear combination of X variables, i.e., $X_1, X_2$ etc., and linear combination of Y variables, i.e. $Y_1, Y_2$ etc., which are most highly correlated. This combination is known as the “first canonical variates” which are usually denoted $U_1$ and $V_1$, with the pair of $U_1$ and $V_1$ being called a “canonical function”. The next canonical function, $U_2$ and $V_2$ are then restricted so that they are uncorrelated with $U_1$ and $V_1$. Everything is scaled so that the variance equals 1.

Canonical correlation analysis seeks vectors $a$ and $b$ such that the random variables $a'X$ and $b'Y$ maximise the correlation $\rho = \text{cor}(a'X, b'Y)$. The random variables $U = a'X$ and $V = b'Y$ are the first pair of canonical variables. Then one seeks vectors maximising the same correlation subject to the constraint that they are to be uncorrelated with the first pair of canonical variables; this gives the second pair of canonical variables.

xii) Discriminant Analysis

Discriminant analysis joins a nominally scaled criterion or dependent variable with one or more independent variables that are interval-or-ratio scaled. Once the Discriminant equation is found, it can be used to predict the classification of a new observation.

This is done by calculating a linear function of the form

$$D_i = d_0 + d_1X_1 + d_2X_2 + d_3X_3 + \cdots + d_pX_p$$

where $D_i$ is the score on Discriminant function $i$.
D $d_1$'s are weighting coefficients; $d_0$ is constant.
The X's are the values of the discriminating variables used in the analysis.

A single Discriminant equation is required if the categorisation calls for two groups. If three groups are involved in the classification, it requires two Discriminant equations. If more categories are called for in the dependent variables, one needs N-1 discriminant functions.

While the most common use for discriminant analysis is to classify persons or objects into various groups, it can also be used to analyse known groups to determine the relative influence of the specific factors for deciding into which groups various cases fall.

For the purpose of extensive calculations, software packages such as SPSS, Statistica are applied.

**Post-hoc Test:** Post hoc tests are designed for situations in which the researcher has already obtained a significant omnibus F-test with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other.

Post hoc tests (meaning “after the fact” or “after data collection”) must be conducted in a particular way in order to prevent excessive Type I errors. The reason is that if t-tests or some other “regular” test of significance were used across multiple paired comparisons (for example, three) with alpha = 0.05, then the alpha rate across all three comparisons is 0.05 + 0.05 + 0.05, or 0.15, yielding a 15% Type I error rate. This inflation of Type I error rate across multiple paired comparisons is referred to as increases of error rate experiment-wise (or error rate experiment-wide) (both phrases are common usage).

Post hoc tests of significance allow one to conduct multiple unplanned paired comparisons without inflating the Type I error rate experiment-wise.

Some of the more popular post-hoc tests:
- Fisher’s LSD (Least Significant Different)
- Bonferroni (AKA, Dunn’s Bonferroni)
- Newman-Keuls
Tukey's HSD (Honestly Significant Difference)

Tukey's b (AKA, Tukey's WSD (Wholly Significant Difference)):

Scheffe

Tukey – HSD Test:

The test is perhaps the most popular post-hoc. It reduces Type I error at the expense of Power. Tukey's HSD was designed for a situation with equal sample sizes per group, but can be adapted to unequal sample sizes as well (the simplest adaptation uses the harmonic mean of n-sizes as n*). The formula for Tukey’s is:

\[ HSD = \frac{q}{m} \sqrt{\frac{MSE}{n^*}} \]

where \( q \) = the relevant critical value of the studentised range statistic and \( n^* \) is the number of scores used in calculating the group means of interest.

Procedure to conduct a Tukey’s HSD:

1. Get ANOVA summary table that was used to ensure that overall F-ratio was significant.
2. Calculate Tukey’s HSD as follows:

\[ HSD = \frac{q}{m} \sqrt{\frac{MSE}{n^*}} \]

Where:

- \( q \) = Critical value on Table (given in class) with the following degrees of freedom:
  - For the “numerator”: Number of Means being compared
  - For the “denominator”: df for MSerror from ANOVA summary table
  (use \( \alpha = 0.05 \) unless told differently)
- MS error = MS error from ANOVA summary table (whatever was used as the error term):
  - For a between Ss ANOVA, MSerror is the MS within-groups;
  - For a within Ss ANOVA, MSerror is the MS residual.
- \( n^* \) = number of scores per group or per condition
3. To interpret, understand that the Tukey’s HSD value calculated from the above formula tells you how far apart any two means must be in order them to be significantly different. So arrange your means in pairs (eg., M1 vs. M2, M1 vs. M3, M2 vs. M3, if there are three means in the experiment), then use the following rules:
• If the difference between means (e.g. M1 - M2) is equal to or greater than HSD, then it's significant.
• If the difference between means is less than the HSD value, then it's not a significant difference.
4. Then, use the pattern of significant differences to interpret the data.

LIMITATIONS OF THE STUDY

The study "Impact of Banking Sector Reforms on the Profitability of Commercial Banks in India – a study with reference to Select Public and Private Sector Banks" is a sample study. Hence, the findings of the study are applicable to the select banks that constitute the sample. Since new private sector banks and foreign banks do not form the part of the scope, as either they do not exist before reforms or do not have a wide geographical coverage, the study is limited to select banks. Though the framework of the study is designed systematically and based on firm rationale, the study is not without limitations. The specific limitations are:

1. The study concentrates only on the analysis of quantitative financial data. The qualitative aspects of progress of banking in India have not been analysed. The emerging trends in qualitative aspects of banking such as customer service, job satisfaction, regional disparities and morale of the bank employees and the general public etc., have not been taken into consideration.

2. There has been a lot of window-dressing in presenting final accounts by the commercial banks to hide the actual position. The data relating to deposits and advances, with respect to banks, shot up at the end of the accounting year because of unscrupulous practices followed by branch managers. This fact becomes amply clear when the date at the end of the year is compared with the data on other dates of the year. The data relating to advances and credit deployment is knowingly...
inflated to meet the target. In such a situation, the performance of the related banks cannot be truly assessed.

3. Another limitation of the research endeavour is with respect to the source of data. Different books/reports present different data of the same time with variations. This creates the major hindrance and belies the actual results. Therefore, minor variations are possible in the final result in some cases.

However, appropriate care is taken to ensure that the study is not adversely affected by above limitations in respect of its quality, value of judgement and findings.

CHAPTER LAYOUT

For a better comprehension and with objective orientation, the study is presented in eight chapters.

Chapter One is christened as Introduction which raises the curtain. This chapter provides the horizons of Indian Banking and focuses on the scenario of development phases in the banking sector. As the study is basically with regard to the profitability aspects of commercial banks with banking sector reforms in the background, the financial sector reforms in general and the banking sector reforms in particular have been specifically highlighted in this chapter.

Chapter Two presents a review of literature besides the objectives, database and methodology. A comprehensive review of literature is presented to pinpoint the research gap. The objectives of the study, hypotheses, the period of study and scope of the study, database and methodology, the sample selection, tools of analysis, the
limitations involved and the layout of presentation constitute the important elements of this chapter.

**Chapter Three** provides a focus on the growth, performance and profitability of the Scheduled Commercial Banks by groups during the reform era from 1991-92 to 2008-09.

**Chapter Four** titled 'Profile of Select Banks' provides a canvas of the history and the present profile of the banks selected for the study. These include six banks i.e., State Bank of India, Canara Bank, Vijaya Bank in the public sector and ING Vysya Bank, Karur Vysya Bank and Lakshmi Vilas Bank in the Private Sector to have a balanced and comparative perspective of the profile of the select banks. The presentation of this chapter is based on the select criteria which consists number of branches, number of employees, total assets, business per employee, capital adequacy ratio and capital funds etc.

**Chapter Five** is an enquiry into the impact of the banking sector reforms on the profitability of select public and private sector banks. An analysis of the influence of reforms on profitability of select banks has been presented in this chapter in the broad framework of select indicators in Section-A. This include gross income, total assets, ratio of gross income to total assets, operating income, ratio of interest income to total assets, net interest income, ratio of net interest income to total assets, other income, ratio of other income to total assets, net profit margins, ratio of net profit to total assets, net profit to gross income, return on assets, profit per employee, earning per share, dividend per share, ratio of wages to total expenses, percentage of operating expenses to total assets and also total cost to total assets ratio. Section-B of the chapter covers Statistical Analysis for measuring significance of difference and influence of variables.
Chapter Six presents a comparative analysis of profitability of the select public sector banks against the private sector banks in the two identified phases of regime of reforms. For the purpose of a comparative analysis of profitability, different parameters relevant have been selected and a trend analysis of profitability of the select individual banks as well as comparative scenario of the public sector and private sector banks has been presented in this chapter.

Chapter Seven focuses on the post-reform issues and challenges encountered by the commercial banks in improving their profitability in the light of the reforms repercussions.

The Eighth and last chapter deals with Findings, Conclusions and Suggestions. This chapter presents the findings and conclusions emanated from the study and put forward the suggestions prominent for policy formulation in the direction of improvement of profitability, commercial and economic viability of banks in India.
REFERENCES


70. Vasudevan Committee (1999), "Report on Technology Upgradation in the Banking Sector".


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