Chapter 1
Introduction

1.1 Background of the study

It has been well documented in the literature that the efficiency of the banking system is germane to the performance of the entire economy because only an efficient system guarantees the smooth functioning of nation’s payment system and effective implementation of the monetary policy. Rajan and Zingales (1998) asserted that a sound banking system serves as an important channel for achieving economic growth through the mobilization of financial savings, putting them to productive use, and transforming various risks. The efficiency of the banking system also bears direct implications for social welfare. Society benefits when a country’s banking system becomes more efficient, offering more services at a lower cost (Valverde et al., 2003).

Owing to aforementioned socio-economic implications of banking efficiency, the analyses of relative efficiency of banks gained a lot of popularity in recent years among the policy makers, bank managers, bank investors and academicians. The information obtained from a banking efficiency analysis can be used either: (i) to inform government policy by assessing the effects of deregulation, mergers, or market structure on efficiency; (ii) to address research issues by describing the efficiency of an industry, ranking its firms, or checking how measured efficiency may be related to the different efficiency techniques employed; or (iii) to improve managerial performance by identifying ‘best-practices’ and ‘worst-practices’ associated with high and low measured efficiency, respectively, and encouraging the former practices and while discouraging latter (Berger and Humphrey, 1997).

The financial sector, particularly banking sector has undergone a significant transformation throughout the world since the early 1980s under the impact of deregulation, globalization, financial innovation and technological progress (Reserve Bank of India, 2008). The banking system in India has not remained insulated from the global trends, and deregulated its banking sector in 1992. From the late 1960s through the early 1990s, the Indian banking sector was marked by a high degree of regulation and the parameters like business growth and branch network were the major performance criteria. During this period, the Government of India (GOI) extensively
used the banking system as an instrument of public finance (Hanson and Kathuria, 1999). Substantial and increasing volumes of credit were channeled to the government at the below-market rates through high and increasing cash reserve requirements (CRR) and statutory liquidity requirements (SLR) in order to fund a large and increasing government deficit at relatively low cost (Sen and Vaidya, 1997). In fact, the heavy hand of government has been omnipresent in the banking sector, especially in the working of public sector banks (PSBs), and there was very limited market-based decision making. Furthermore, the competition in the banking sector was virtually absent. Bank deposit and lending rates were mostly controlled, and high statutory pre- emptions and directed lending requirements left banks with little funds for commercial lending (Bhattacharyya and Patel, 2003). Reddy (1998) observed that during this period, for every rupee of deposit in banks, only about one-third to one-half was available for lending to the commercial sector.

Further, rates of return were low by international standards, the capital base had eroded, non-performing assets were on the rise, and customer service was below expectation (Sarkar, 2004). More important, the lack of proper disclosure norms led to many problems being kept under cover. Poor internal controls raised serious doubts about the integrity of the system itself (Reddy, 1998). In such an operating environment, many banks became unprofitable, inefficient, and unsound owing to their poor lending strategies and lack of internal risk management under government ownership (Joshi and Little, 1996; Shirai, 2002). Jagirdar (1996) observed that the average return on assets (ROA) in the second half of the 1980s was only about 0.15% which was abysmally low by all standards. Further, in 1992-93, non-performing assets (NPAs) of 27 PSBs amounted to 24% of total credit, only 15 PSBs achieved a net profit, and half of the PSBs faced negative net worth (Shirai, 2002). This not only reduced banks’ incentives to operate properly and hence their performance, but also undermined regulators’ incentives to properly supervise banks’ performances (Shirai and Rajasekaran, 2002). All in all, all the signs of ‘financial repression’ were found in the system, and the state of the banking sector in India could be described as a classic example of ‘financial repression’ à la MacKinnon and Shaw (Mohan, 2007). The main consequence of this financial repression was an ascent in the volume of bad loans due
to ineffective credit evaluation system and poorer risk assessment policies. Further, poor disclosure standards abetted corruption by window-dressing the true picture of banks. The overstaffing, over-branching and undue interference by labour unions resulted in huge operating losses. This led to a gradual decline in the profitability and efficiency of Indian banks, especially with the public ownership. In fact, in late 1990s, Indian banking system was on the verge of a crisis and lacking viability even in its basic function of financial intermediation.

For getting rid of this distressed banking system, the policy makers\(^1\) felt a need of reform measures to improve the health of the Indian banking system. Consequently, the first phase of banking reforms was set in motion in the year 1992 based on the recommendations of the Committee on the Financial System (1991)\(^2\). The key objective of the reforms was to transform the operating environment of the industry from a highly regulated system to a more market-oriented one with a view to increasing competitiveness and efficiency (Sarkar, 2004). Nevertheless, it is significant to note that the main focus of the reforms process was to increase the profitability and efficiency of the then existing PSBs that controlled about 90% of all deposits, assets, and credit (Shirai, 2002). The reforms process heralded the beginning of implementing prudential norms consisting of capital adequacy ratio, asset classification, income recognition and provisioning, and the deregulation of the operating environment (Agarwal, 2000). In order to impart more vitality and autonomy to banks in their operations, the policy makers successfully adopted the route of partial privatization of PSBs, interest rate deregulation, relaxing entry norms for domestic private and foreign banks, and removal of ‘financial repression’ through reduction in statutory pre-emptions. This phase of banking reforms produced some favourable outcomes as reflected by the fact that most of the banks had achieved the international standards of capital adequacy norm of eight percent of the risk weighted assets, had earned operating profits, and had reduced significantly the proportion of non-performing assets (NPAs) to the total assets (Sarma, 1995).

The success of the first phase of banking reforms catalyzed the move towards the next phase in the year 1998. The recommendations of the Committee on Banking Sector Reforms (1998)\(^3\) provided the blueprint of second phase of banking reforms.
The key focus of this phase has been on strengthening the foundations of the banking system as well as on the issues like upgradation of technology and human resource development (Bhaumik and Mukherjee, 2001). The basic tenet of reform measures in this phase was to usher the transparency in financial statements, diversification of ownership and strong corporate governance practices to mitigate the prospects of systemic risks in the banking sector. In view of that, the prudential norms have been made more stringent and tighter to bring these at par with international standards. On the whole, the thrust of the banking reforms programme since 1992 was on (i) the promotion of efficiency through competition and market orientation, and (ii) strengthening the shock absorptive capacity of the system through adoption of prudential norms and tightening of supervision.

Although the broad contours of reform measures in the banking sector have been provided by the aforementioned committees but a large number of committees and working groups have been constituted for addressing the specific issues in the banking sector. For example, Janakiraman Committee (1992) investigated irregularities in fund management in commercial banks and financial institutions. Padmanabhan Committee (1996) focused on the on-site supervision of banks, and recommended the implementation of CAMELS rating methodology for on-site supervision of the banks. Khan Committee (1997) suggested specific measures for bringing about harmonization in the lending and working capital finance by banks and Development Financial Institutions (DFIs). Verma Committee (1999) concentrated on the restructuring of weak PSBs. The committee identified three weak banks, viz. Indian Bank, United Commercial Bank and Union Bank of India, and suggested introducing Voluntary Retirement Fund enabling the bank to reduce excess manpower. Vasudevan Committee (1999) recommended the strategy of upgradation of the existing technology in the banking sector. Mittal Committee (2000) made vital recommendations on the regulatory and supervisory frameworks for internet banking in India. Mohan Committee (2009) which is popularly known as the Committee on Financial Sector Assessment has suggested significant measures to improve the stability and resilience of the Indian financial system.
During the last 19 years, an extensive programme of banking reforms has been followed for strengthening of market institutions and allowing greater autonomy to the banks. The details on various reform measures and their impact on the structure of Indian banking industry has been documented. In this context, reference may be made to the works of Sen and Vaidya (1997), Hanson and Kathuria (1999), Arun and Turner (2002), Shirai (2002), Bhide et al. (2002), Yoo (2005), Hanson (2005), Reddy (2005b), and Roland (2008). However, a brief discussion on the areas in which reforms have been introduced is presented here. First, the structure of administered interest rates has been almost totally dismantled in a phased manner. The purpose of deregulating interest rates was to stimulate healthy competition among the banks and to encourage their operational efficiency. Second, for making available a greater quantum of resources for commercial purposes, the statutory pre-emptions have gradually been lowered. Third, towards strengthening PSBs, GOI recapitalized these banks to avert any financial crisis and to build up their capital base for meeting minimum capital adequacy norms. Further, the policy makers permitted PSBs to expand their capital base with equity participation by private investors up to the limit of 49%. Fourth, the policy makers introduced improved prudential norms related to capital adequacy, asset classification and income recognition in line with international norms, as well as increased disclosure level. Fifth, the burden of directed sector lending has been gradually reduced by (a) expanding the definition of priority sector lending, and (b) liberalizing lending rates on advances in excess of ₹0.2 million. Sixth, entry regulations for domestic private and foreign banks have been relaxed to infuse competition in the banking sector. Seventh, impressive institutional reforms have been introduced to strengthen the supervisory authorities. Eighth, PSBs have been allowed to rationalize some branches while branch licensing has removed.

While India’s approach to banking reforms has been in line with global trends, one unique feature of this approach is that instead of launching the banking reforms in a ‘big bang’ fashion, Indian policy makers pursued a ‘cautious’ or ‘gradualist’ approach to strengthen accounting, legal, supervisory, and regulatory frameworks pertaining to the banking sector. In sum, the process of reforms was initiated in a gradual and properly sequenced manner so as to have a reinforcing effect (Reddy,
The policy makers sought to consistently upgrade the banking sector by adopting the international best-practices through a consultative process.

During the post-deregulation years since 1992, Indian banking system has undergone significant changes. A remarkable trend is the shift from traditional banking activities such as lending and deposits taking to a more universal banking character with financial market activities such as brokerage and portfolio management growing in importance. Thus, the traditional role of banks as mere financial intermediaries has since altered, and risk management has emerged as the defining attribute. While deregulation has opened up new vistas for banks to augment their incomes, it has also entailed greater competition and consequently, greater risks. Banks have been provided significant operational freedom in their resource allocation using their commercial judgments in a market-oriented environment. The banking system has also witnessed greater levels of transparency and standard of disclosure.

A positive externality of the banking reforms process has been the building up of the institutional architecture in terms of markets, and creation of enabling environment through technological and legal infrastructure and improving the managerial competence (Bhide et al., 2002). The most notable achievement of banking industry is the significant improvement in capital adequacy and asset quality. This has been achieved despite convergence of the prudential norms with the international best-practices. The capital adequacy ratio has increased to 14.5% for scheduled commercial banks at the end-March 2010, which is much above the international norm. Commercial banks’ net profits are at 1.13% and 1.05% of total assets during 2008-09 and 2009-10, up from 0.16% in 1995-96. The net non-performing assets declined to 0.94% of net advances during 2008-09 from 8.91% in 1995-96. Further, the intermediation process has also improved during the post-reforms years. In the post-1992 period, a wave of voluntary mergers and acquisitions swept through the industry as banks tried to cut cost and achieve economies of scale.

With the completion of about 19 years of banking reforms process, it seems pertinent to take stock of the impact of reform measures on the efficiency of commercial banks. A theoretical proposition appears in the banking literature that a deregulatory process increases competitive forces in the financial system so that
‘banks not allocating their resources efficiently would perish unless they could become like their efficient competitors by producing more output with exiting inputs’ (Alam, 2001). In the spirit of this proposition, an ascent in input-conserving efficiency of banks during the post-deregulation years would reflect a positive response by the banks to the reform measures, and thus, signals the success of the reforms process in accomplishing its goal of attaining high operating efficiency in Indian banking industry.

1.2 Motivation, objectives and significant research questions

As noted above, the thrust of banking reforms programme was not only on the improvement of operating efficiency through inculcating the spirit of competition among Indian banks but also on strengthening the shock absorptive capacity of the banking system through the adoption of internationally accepted prudential regulations. Accordingly, the Reserve Bank of India (RBI) has thus far promoted, among others, the participation of foreign banks, technological upgradation in the banking sector, recapitalisation of public sector banks, liberalisation of the branch authorisation policy, adoption of innovative policy measures for financial inclusion, and application of countercyclical prudential measures (Reserve Bank of India, 2010).

How the deregulation of banking environment has influenced the way banks transformed their resources into banking services and outputs have remained largely unexplored in Indian context. In this regard, continuous year to year assessment of the performance of banks is crucial because the banking industry has undergone financial innovations and shocks throughout the 1990s either due to the changing regulations or unexpected shocks. Therefore, there are strong reasons to expect that efficiency measures of banks may have fluctuated over the short periods of time. Hence, we felt a need to examine the efficiency performance of the Indian banking industry over a longer period so that we could evaluate not only the impact of these regulatory changes but also the effects of such shocks, including substantial improvement in banking technology, on the efficiency of banks.

In the Indian context, strengthening of regulatory and accounting frameworks for ensuring financial stability and improvement of allocative and productive efficiency of banking industry is the core agenda of the RBI and GOI. Therefore, any
attempt to evaluate the trends in efficiency of Indian banks in the resource allocation and utilisation process during the post-deregulation years will not only assist the government instrumentalities and banking regulators in policy making, but will also enable the banks’ management to improve the way in which they allocate and use resources in the production process. With this in mind, we outline the objectives of the present study.

The broad objective of the research is to examine how deregulatory changes in the Indian banking sector during the post-reforms years (1992-93 to 2007-08) affected the cost efficiency and total factor productivity (TFP) growth of the banking industry in India. In particular, the major objectives of this study are as follows:

(i) To undertake a comprehensive review of the banking reforms introduced in the Indian banking industry since 1992;
(ii) To gauge the impact of inclusion or exclusion of non-traditional activities on the cost efficiency estimates for Indian banks;
(iii) To examine the trends in cost, allocative, technical, pure technical and scale efficiencies in the Indian banking industry as a whole, and across distinct ownership groups and various size classes during the post-deregulation period;
(iv) To analyze the nature of returns-to-scale (RTS) in Indian banking industry;
(v) To explore the influential factors that affect the cost efficiency and its component measures of Indian banks; and
(vi) To study the impact of the deregulation process on the total factor productivity (TFP) growth of Indian banks.

In the light of aforementioned objectives of the study, we primarily focused on seeking the answers of the following research questions:

(i) Does the inclusion of non-traditional activities in the specification of banks’ output affect the efficiency of Indian banks?
(ii) Did deregulatory measures improve the efficiency and productivity of Indian banks?
(iii) Are foreign banks always best?
(iv) Does size matter in Indian banking industry?
Are there any economies or diseconomies of scale in the Indian banking sector?

What are most influential bank-specific variables affecting the efficiency and TFP growth of Indian banks?

The Indian banking sector is of particular interest for a number of reasons. First of all, India’s approach to introduce the deregulation in the banking sector in a gradual manner offers a great scope for examining whether reforms should carry in a big bang way/fashion or sequenced at removing regulatory and operating constraints slowly over the years so as to augment the resource-use efficiency of the distressed banks. Secondly, the diverse ownership of the Indian banking system provides an opportunity for a test of performance differentials between public, private and foreign banks in reaction to a changing regulatory environment. Thirdly, Indian banking is a considerable component of Asian financial markets, and it shares quite similar characteristics with the banking system of other Asian countries. Since most Asian countries have embarked on a deregulation path or are contemplating to do so, an empirical investigation of the effects of deregulation on the dynamics of efficiency and productivity change in the Indian case could provide useful policy suggestions to those countries.

1.3 Contribution of the study

From the survey of empirical literature on the banking efficiency in India, it has been observed that the existing studies concerning the efficiency of Indian banks have not been of a comprehensive nature. The present study is targeted to enrich the extant literature on the efficiency of Indian banks by providing a detailed analysis of some significantly understated and hitherto neglected aspects relating to the efficiency of Indian banks. In particular, the contribution of the present study to the existing literature is in following directions.

First, the study provides a detailed analysis of the trends in cost efficiency and TFP growth of the Indian banking industry as a whole, and distinct ownership groups and size classes during the post-deregulation period. Such a detailed and comprehensive analysis is not available in the existing literature. Further, the sample period investigated by previous Indian bank studies, is generally not long enough to
shed much light on the impact of the banking reforms programme. In contrast, this study uses a longer sample period (16 years) which covers both the first phase of banking reforms (1992-93 to 1997-98) and the second phase of banking reforms (1998-99 to 2007-08). In particular, the sample period is embarked by drastic and intensive banking reforms involving significant governance changes in all types of scheduled commercial banks.

Second, the present study provides the growth behaviour of five alternative measures of banking efficiency, i.e., cost, allocative, technical, pure technical and scale efficiencies as a way to strengthen the validity of inference drawn on the basis of empirical results. This is really a somewhat missing in the existing studies on the efficiency of Indian banks. The previous studies generally computed one or two efficiency measures, and drew the inferences based on those efficiency measures.

Third, this research work has been carried out to verify the relevance of including non-traditional activities in the output vector. Recently, the researchers highlighted the expanding involvement of banks in off-balance sheet (OBS) activities and their impact on efficiency performance of banks. It is worth noting here that majority of recent studies on efficiency in Indian banks have accounted for non-traditional activities by including non-interest income in the output vector as a proxy for these activities. However, to the best of our knowledge, none of these studies have investigated the impact of inclusion or exclusion of these activities on the efficiency estimates. Thus, a clear void exists in available literature since no study has been conducted to analyze how the entire distribution of efficiency scores differs when these activities are not considered. The present study made an attempt in this direction and targeted to enrich the extant literature on the efficiency of Indian banks by providing a detailed analysis of this significantly understated and hitherto neglected aspect relating to the efficiency of Indian banks.

Fourth, the recent research found that risk variables significantly alter X-inefficiency of the banks. Keeping this in view, we have incorporated the risk element in the efficiency appraisal of the Indian banks. This is accomplished by including equity as a quasi-fixed input variable in the input-output specification used for computing different efficiency measures.
Fifth, we employ a non-radial Malmquist productivity index (MPI) approach as suggested by Tone (2001) to decompose total factor productivity (TFP) change in its distinct components, technical efficiency change (capturing the catching-up effect) and technological change (measuring the frontier-shift effect). To the best of our knowledge, this is perhaps the first empirical study to estimate TFP growth of Indian banks by using the slack-based measure (SBM) model to compute input-oriented distance functions. Earlier attempts in measuring TFP change in Indian banks made use of radial MPI approach, which does not deals with input/output slacks directly.

Sixth, the existing literature on the banking efficiency does not provide clear and robust results with respect to the key determinants of efficiency of Indian banks. In this study, we made efforts to explore the potential determinants of banking efficiency, such as profitability, asset quality, size, etc. To this end, we employ the so-called two-stage DEA procedure, and applied panel data based random-effects Tobit model, which is perhaps not utilised earlier in banking efficiency analyses of Indian banks.

Seventh, this study provides a detailed analysis of nature of returns-to-scale in the Indian banking industry. In particular, we made use of López-Cortés and Snowden’s (1998) scale deficiency index and applied Fukushige and Miyara’s (2005) procedure for testing the statistical significance of returns-to-scale at the industry level.

1.4 Structure of the thesis

This thesis aims at bridging the gap in the extant literature by empirically investigating the different aspects of the efficiency of Indian commercial banks. To present the discussion in a lucid way, we organized the thesis into eight chapters (see Figure 1.1).
In the current chapter, we have illuminated the background of the study, and highlighted the precise objectives and contributions of the thesis. Chapter 2 provides a history of the Indian banking industry, and discusses the process of transformation of banking industry from the state of high degree of regulation to deregulation and liberalization. The current structure of Indian banking industry is also presented in this chapter. In Chapter 3, the various parametric and non-parametric approaches used in the banking efficiency analyses have been discussed. Chapter 4 presents a thematic survey of empirical literature on banking efficiency. The prominent issues in the banking efficiency literature have also been discussed.

The chapters 5, 6 and 7 are empirical in nature. In Chapter 5, an attempt has been made to examine the relevance of non-traditional activities in the output specification of Indian banks. Further, efforts have been made to measure to what extent the relative rankings of individual banks and ownership groups are affected by

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Purpose/Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1</td>
<td>Introduction</td>
<td>Background of the study</td>
</tr>
<tr>
<td>Chapter 2</td>
<td>Banking System in India: Developments, Structural Changes and Institutional Framework</td>
<td>History of Indian banking industry</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Measurement of Banking Efficiency: Analytical Methods</td>
<td>Review of the approaches to measure banking efficiency</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>A Survey of Empirical Literature on Banking Efficiency</td>
<td>Empirical literature review</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Relevance of Non-traditional Activities on the Efficiency of Indian Banks</td>
<td>Analysis and interpretation of empirical results</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Trends and Determinants of Cost Efficiency in Indian Banking Industry</td>
<td></td>
</tr>
<tr>
<td>Chapter 7</td>
<td>Sources of Productivity Gains in Indian Banking Industry: Is it Efficiency Improvement or Technological Progress?</td>
<td></td>
</tr>
<tr>
<td>Chapter 8</td>
<td>Summary and Conclusions</td>
<td></td>
</tr>
</tbody>
</table>
the inclusion or exclusion of non-interest income as a proxy for non-traditional activities. Chapter 6 explains the evolution of cost efficiency and its component measures in Indian banking industry during the post-deregulation years. In this chapter, we also explored (i) efficiency differences across distinct ownership groups and various size classes, (ii) nature of returns-to-scale in Indian banking industry, and (iii) the key factors influencing the inter-bank variations in cost efficiency and its components. Chapter 7 provides the empirical evidence on TFP growth of Indian banking industry during the post-deregulation period. Factors explaining the variations in TFP growth and its components have also been discussed. Chapter 8 summarizes the major findings of this study and recommends policy changes with a view to enhance the efficiency and productivity of banks operating in India. Enunciating the limitations of the study, the chapter ends by providing some directions on possible future research in the area.
In India, the policy makers that have been entrusted with the task of formulating the policies for banking sector comprise the Reserve Bank of India (Central Bank), Ministry of Finance, and related government and financial sector regulatory entities.

This committee is popularly known as Narasimham Committee I, named after its chairman M. Narasimham.

This committee is popularly known as Narasimham Committee II, named after its chairman M. Narasimham.

Except saving deposit account, non-resident Indian (NRI) deposits, small loans up to ₹0.2 million and export credit, the interest rates are fully deregulated.

The combined pre-emption under CRR and SLR, amounting to 63.5% of net demand and time liabilities in 1991 (of which CRR was 25%) has since been reduced and presently, the combined ratio stands below 35% (of which, the SLR is at its statutory minimum at 24%).

The GOI has injected about 0.1% of GDP annually into weak public sector banks (Hanson, 2005; Rangarajan, 2007). During the period 1992-93 to 2001-02, GOI contributed some ₹177 billion, about 1.9% of the 1995-96 GDP, to nationalized banks (Mohan and Prasad, 2005).

In 1993, the State Bank of India (SBI) Act, 1955 was amended to promote partial private shareholding. The SBI became the first PSB to raise equity in the capital markets. The amendment of the Banking Regulation Act in 1994 allowed the PSBs to raise private equity up to 49% of paid up capital. Since then 20 PSBs have diversified their ownership, although the government has remained as the largest shareholder.

India adopted the Basel Accord Capital Standards in April 1992. An eight percent capital adequacy ratio was introduced in phases between 1993-1996, according to banks ownership and scope of their operations. Following the recommendations of Narasimham Committee II, the regulatory minimum capital adequacy ratio was later raised to ten percent in the phased manner.

The time for classification of assets as non-performing has been tightened over the years with a view to move towards the international best-practice norm of 90 days by end 2004.

From 2000-2001, the PSBs are required to attach the balance sheet of their subsidiaries to their balance sheets.

Priority sector has been redefined to comprise small and marginal farmers, tiny sector of industry, small business and transport operators, village and cottage industries, rural artisans and other weaker sections.

In 1993, the RBI issued guidelines concerning the establishment of new private sector banks. Nine new private banks have entered the market since then. In addition, over twenty foreign banks have started their operations since 1994.

A high powered Board of Financial Supervision (BFS) has been constituted in 1994. BFS exercised the power of supervision in relation to the banking companies, financial institutions, and non-banking companies, creating an arms-length relationship between regulation and supervision. On-site supervision was introduced in 1995, and annual supervision of capital adequacy, asset quality, management quality, earnings, liquidity, and systems (CAMELS) was introduced in 1997.