Chapter 1

INTRODUCTION
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Introduction

1. Significance

Finance and growth are interdependent. With the growth of economy, the banking sector also has to develop pari passu, so that it supports and stimulates growth. The role of banks in expanding economy of a country like India can neither be underestimated nor overlooked. Banking Sector acts as a catalyst in socio-economic transformation of a nation. Commercial banks play a very significant role in directing the economic activities of nations in attaining objectives such as productivity, competitiveness and market-driven culture. Therefore strong, efficient and healthy banking is a prerequisite for the development of an economy. The need of the hour is to strengthen the overall financial system in line with international standards so that each participating unit is able to compete with global players.

Over the past 20 years, there have been several examples of banking crises that have threatened wider systemic damage. Instances of Mexico (1982), Latin American debt crises of the 1980s, Mexican crisis in 1994 and 1995, and then the east Asia's debt problems of 1997 and 1998, Russian crisis of 1998 and that of Brazil in 1999 - are all sad reminders of how banking sector weaknesses can result in huge economic losses involving sometimes massive costs of banking sector restructuring.

At this present juncture, early in the 21st century, India is at an unprecedented moment in its economic growth phase. Since 1993-94, the country has not just managed to restore the higher growth that it had achieved in the decade of 1980s but has sharply reduced the volatility in its GDP growth. This is made possible by the steady improvement in Indian economy's exposure to external shocks in recent years.

A steady improvement in India’s strength of its banking system is not an uncorrelated event. Like many advanced countries such as UK, USA, Germany and Japan, India too has a bank-dominant financial system, which is highly diversified
in its composition. The present Indian banking system consists of RBI\(^*\), Indian Commercial Banks, Cooperative banks, Regional Rural Banks, foreign banks and other specialised financial institutions.

Banks are treated as an instrument for conversion of static credit into dynamic credit. Commercial banks constitute the heart of Indian financial system as they have the ability to add to the money supply. Banks in India have played a leading role in mobilising savings, allocating capital, overseeing the investment decisions of firms, besides providing risk management vehicles.

Public Sector Banks being an important group in the banking structure of India, acts as a milestone for the growth and prosperity of the country. Banks were nationalised by the government in 1969 and 1980 with an objective to regain control on flow of credit for balanced growth of economy. During the post-nationalisation era, PSBs\(^2\) have been called upon to assume a variety of new responsibilities in the area of social banking. For two decades since nationalisation of banks in India there has been only growth in balance sheet of banks—an increase in deposits and loans driven primarily by an expansion of branches. Indian Banking system is one of the largest branch networks in the world, which is evidenced by branch expansion from 8,262 in 1969 to over 69,071 in 2004. This led to financial deepening as the Deposit to GDP ratio rose from 16.4 per cent in 1971-75 to 36.1 per cent in 1989-90 and further to 60 per cent in 2004-2005. Bank credit to commercial sector also increased from 15.6 per cent to 30.3 per cent of GDP in 1989 and 48 per cent in 2005-2006\(^**\). However, in early 1990s it was realised that in this process “Quantitative Banking”, we totally ignored “Qualitative Banking”.

According to McKinnon and Shaw, until the beginning of the 1990s, the state of the financial sector in India could be described as a classic example of “Financial Repression”. The banking sector in India was characterised by administered interest rate, large pre-emption of resources by the authorities, extensive micro regulations, opaque disclosure norms, mounting poor quality assets, inadequate risk absorbing capital and inefficiency. The critics of nationalisation were of the notion

\(^*\) RBI: Reserve Bank of India being the Central Bank of the country and head of all financial institution
\(^2\) PSBs: Public Sector Banks
\(^**\) Source: Statistical Tables relating to banks in India. Published by RBI, 2000-01, 2002-03, 2004-05 2005-06
that nationalisation policy and government ownership are responsible for the pathetic performance of PSBs. To avoid any major financial crisis of economy a balanced approach to “Quantitative and Qualitative Banking” is the must and so financial reforms in India were initiated with the setting up of Narasimham Committee I.

Financial sector reforms were introduced in India after the massive financial crisis of 1991. The Narasimham Committee Reports I and II had heavily relied on Basel I for their entire agenda for the banking sector reforms in India. These reforms were undertaken essentially to complement the reforms initiated in the real sectors. Simultaneously with the removal of the obstacles of the licensing regime in the manufacturing sector, the financial sector underwent a massive transformation with the ultimate objective of becoming a strong and viable entity.

Modern banking in India has witnessed a rapid change in terms of organisational structure, regulation and scale of operations. The process of providing banking services has, however, changed rapidly from traditional banking in recent years. Banks in India particularly PSBs have been successful in enhancing profitability, reducing bad quality assets, achieving new prudential regulation etc. due to adoption of timely reform process. Today, banks have emerged as a one-stop shop of varied financial services and the old institution-specific segmentations have blurred considerably. The rapid pace of technological advancement and internationalisation of banking services have opened many new frontiers for banks. To fulfil the financial needs of a growing economy like India, banks have been undertaking progressively more complex financial operations both in terms of credit and trading, which are exposing them to different kinds of risks. In recognition of this trend, the Reserve Bank of India has been highlighting the importance of improved risk management practices since 1999. The RBI has always laid emphasis on gradual convergence of Indian financial system with internationally practiced best standards that suit India’s micro and macro economic conditions.

The expanded use of securitisation and derivatives in secondary markets and vastly improved risk management systems had significant implications for Basel I. For banks that operate on a global scale virtually in different financial markets, Basel I has become outdated and thus a new framework know as Basel II was proposed on
June 26, 2004 to address new perception of risks in financial system. India too was not an alien to such dynamism in banking environment. Some of the major challenges faced by modern banking are as follows:

- Adoption of “Risk Base Supervision” to establish safe and commercially viable banking
- Ensure better quality assets
- Reduction in cost of operations.
- Achieve the “Trigger Ratio and “Target Ratio” set by regulatory authorities
- Enhance competitive equality
- Ensuring competitive risk adjusted return
- Enhance efficiency, productivity and profitability
- Internal control / corporate governance
- Adaptation to fast changing business environment
- Competitive product engineering
- Managing off-balance sheet items and explore sources of revenue from it

As even single large bank failure can cost billions of rupees, bank failure prediction represents an important economic issue. Effective financial planning, securing adequate profitability, and better internal control mechanism can check probability of banks failure. Banks are exposed to different kinds of risk such as financial risks, credit risk, interest rate risk, liquidity risk and operational risk. Managing and forecasting forthcoming risks and initiating prompt corrective actions would facilitate in building commercially viable banking system in the country and avoid any moral hazard in the system.

Against the above mentioned backdrop, an attempt has been made in this study to highlight many of the issues related to the performance of Nationalised Commercial Banks by using internationally accepted benchmarks model such as CAMELS Model, which has been designed to suit the Indian banking industry.
II. Background of CAMELS Model

CAMEL was originally developed by the FDIC*, USA to determine the schedule of on-site examinations of a bank (Thomson, 1991). The model facilitates in knowing the likelihood of bank’s failures, which may result when any of the five variables embodied in CAMEL is found to be inadequate. The model is basically useful to understand bank’s financial health and predict in advance the forthcoming risk of failure.

The model focuses on capturing information that is representative of Capital Adequacy (C), Asset Quality (A), Management Quality (M), Earnings (E) and Liquidity (L). These variables are essential for healthy banking practices and could be designated as a CAMEL Model. The Bank Supervisors of USA added another variable in the model i.e. Systems & Control (S) in January 1997. Thus, CAMEL Model was modified to CAMELS Model. However, the last variable is country specific and varies from country to country. The choice of these factors is based on facts that each factor is representatives of major element in a bank’s financial statements. A weakness in any of these major factors may present a threat to a bank's continuing existence.

The use of CAMELS Model, which avoids probability of failure, has played a very significant role in strengthening the Banks in many advanced and developing countries. The major reason for popularity of CAMELS model is that it is based on combination of financial management and non-financial management parameters (Systems & Control elements) with major emphasis on risk based supervision and Prompt Corrective Actions. In this study system & control has been quantified and is assumed at part with operational risk management. For the purpose of quantifying operational risk prudential ratio and cost function ratios have been used alongwith other variables in the model.

III. Significance of CAMELS Model for performance evaluation

CAMELS based approach focuses mainly on aspects crucial to the bank’s financial soundness with a recent shift in focus towards risk management. Areas relating to internal control, credit management, overseas branch operations, profitability,

* Federal Deposit Insurance Corporation, USA
compliance with prudential regulations, developmental aspects, proper valuation of asset/ liability, portfolio investment are also covered under different categories of the ratios in the model. These ratios can help the supervisors and the management to set "TRIGGERs Ratios" and "TARGET Ratios" and thus initiate Prompt Corrective Action so that forthcoming financial and operational risks could be avoided. Overall performance in terms of Assets Quality, Earning and Productivity could also be enhanced. For a profit making organisation like a bank the motto of strong and viable banking system cannot be ignored.

IV: Review of Literature
Several studies have examined financial distress, which is a pre-condition to a firm’s failure. In general, these studies have found that accounting information can detect incipient financial distress of a firm. It has been documented in different academic studies that different sets of variables are important in predicting financial distress at the different levels. Bearing in mind the significance of banks for overall development of an economy and society, many scholars have conducted performance evaluation of banks. Various techniques that have been used for such analysis are CAMELS Model, Prompt Corrective Action (PCA) and Early Warning Models (EWS) to predict probability of failure of commercial banks. Honohan (1997) has estimated that since 1980, the resolution costs of banking crises in all developing and transition economies have approached a quarter of a trillion dollars.

The majority of prior research conducted for performance evaluation and to predict failure of banks have emphasised on capturing information that is representative of Capital Adequacy (C), Asset Quality (A), Management Quality (M), Earnings (E) And Liquidity (L), could be designated as a CAMEL model. The choice of these factors on this perspective has been based on different VARIABLES and SUB-VARIABLES that are representative of major components in a banks’ financial statement. These VARIABLES and SUB-VARIABLES are important for performance evaluation.

In general, research to predict bank failure (Meyer and Pifer, 1970; Sinkey 1975; Martin, 1977; Sinkey, 1978; Pettway and Sinkey, 1980; West, 1985; Lane et al., 1986; Looney et al., 1989; Espahbodi, 1991; Tam and Kiang, 1992; Whalen, 1991; Thomson, 1991; Amos, 1992) occurred through assessment of the usefulness of
varying financial measures with utilization of a range of statistical methods, with minimal reference to the above mentioned indicators comprehensively.

Many researchers performed variety of measures relating to each of the five CAMEL factors with variable selection often occurring as a function of a statistical method, such as step-wise regression or factor analysis. Lane et al. (1986) included 21 financial ratios as representative of all five factors in CAMEL. Martin’s (1977) model consisted of 25 variables as representative of CAMEL, while West (1985), Espahbodi (1991) and Tam and Kiang (1992) employed 19 variables covering four of CAMEL categories. Looney et al. (1989) and Lane et al. (1986) used a stepwise approach to narrow their set of variables from 21 to 4. Amos (1992) has studied the regional distribution of bank’s failure.

Supervisors have developed various tools for using call report data to schedule and plan exams, including econometric model. A common type of model used in surveillance estimates the marginal impact of changes in a financial ratio on the probability that a bank will fail, holding all other ratios constant. These models can examine many ratios simultaneously, capturing subtle but important Interactions. The Federal Reserve (The Central bank of USA) uses two models in offsite surveillance viz. SEER and hypothetical CAMEL rating that is consistent with the financial data in the bank’s most recent call report. (Gilbert et al, 2000).

According to Collier et al (2003), the Statistical CAMELS Off-Site Ratings (SCOR) model has played an important role in the FDIC supervisory process, in resource allocation for examinations, and in tracking industry trends. The SCOR model predicts the probability that a bank will be assigned a specific rating (1, 2, 3, 4, and 5) and the probability that a bank’s rating will be downgraded. The following financial variables were included: total equity capital, loan loss reserve, past due loans 30-89 days, past due loans 90 Plus days, non-accrual loans, other real estate owned, net charge-offs, provision for loan losses, net income, cash dividends declared, volatile liabilities, liquid assets, loans and long-term securities. The model’s accuracy relies on the accuracy of the financial information input into the model.

Thomson’s (1991) Model of bank failures of all sizes is based on Call Report data using a logit regression analysis. The probability that a bank will fail is a function
Introduction

of Capital Adequacy, Asset Quality, Management Quality, Earnings Performance, and the relative Liquidity of the portfolio. These are CAMELS-motivated proxy variables. The majority of these factors are significantly related to the failure probability of banks at least four years in advance.

Gilbert et al (1999) defined four possible states of U.S. commercial banks: bank failure, survival, safe (CAMELS ratings 1 or 2 by supervisors), and watch list (CAMELS ratings 3, 4, or 5 by supervisors). Samples of banks from the 1980s and 1990s were used to compare the performance of econometric models (such as logit analyses) versus supervisory screens in predicting failures of banks 12 to 24 months before failure. They also designed EWS Models to predict the probability that a bank will be downgraded from safe to watch list in 12 to 24 months prior to the fall in supervisory rating. In general, they found that EWS Model outperformed supervisory screens in prediction accuracy. The Equity-Capital ratio was found to be one of the most significant variables in their tests. They further concluded that supervisors could use off-site surveillance via econometric methods to flag banks with increased financial distress and thereby supplement information obtained from onsite supervisory screens.

Barth et al (1996) reported that the importance of the net worth ratio is not surprising since it is the variable that regulators use in closing institutions. Consequently, capital ratios may better represent dependent variables than independent variables in distress studies for financial institutions. Following this line of reasoning, Wheelock and Wilson (2000) conducted a study on the determinants of bank failure with the dependent variable defined as total equity to total assets ratios less than 2 percent. They identified 51 banks that were critically undercapitalised (as defined in FDIC Act, 1991) with at least $50 million in total assets in the sample period 1984-1993. According to them as regulators have discretion in closing critically undercapitalised institutions; the 2 percent capital ratio can be considered to be a maximum threshold for financial distress. A competing-risks hazard model was constructed using 18 independent variables representing Capital Adequacy, Asset Quality, Management, Earnings, Liquidity, Size, Age, and Organizational Structure. Interestingly, the variables significant in identifying critically undercapitalised banks were also significant in further tests based on a sample of banks closed by the FDIC as failed. Thus, the determinants of
bank failure and extreme financial distress are quite similar to one another.

Gunter & Moore (2000) examined the efficacy of EWS models with respect to undercapitalised banks in general. However, like Wheelock and Wilson, they provide information on the determinants of financial distress. They also reported evidence on the ability of EWS models to predict such distress one year ahead of time.

Mudenda E, (1998) reported that in January 1996, the Financial System Supervisory Department, (FSSD) created by Bank of Zambia improved the off-site monitoring system by adopting the CAMEL method of financial analysis using traditional ratios, which have been categorised into four component that are essential for a financially viable banks, namely, Capital Adequacy, Asset Quality, Earnings and Liquidity.

DeYoung et al (1998) reported that CAMEL ratings contain information useful to the market for subordinates, bank holding and creditors. Barker and Holdsworth (1993) found evidence that CAMEL ratings are significant predictors of bank failure, even after controlling for a wide range of publicly available information about the condition and performance of banks. Gilbert (1993) addressed different issues concerning the Model. He concluded that more frequent examinations reduced losses to the Bank Insurance Fund, which covers government losses when a bank fails.

Honohan’s (1997) paper on the diagnosis and prediction of banking system failures in developing and transitional countries was a very systematic evaluation of both macro- and microeconomic indicators of bank failures. The macroeconomic indicators were based on aggregate balance sheet data and included the growth in aggregate lending, the loan to deposit ratio and the ratio of foreign borrowing to total deposits. The model used the same ratios in the assessment of microeconomic indicators of bank failures. The study by Gonzalez – Hermosillo (1999) attempted to deal with various shortcomings. She undertook a macro and micro empirical exploration of some recent episodes of banking distress in order to identify ex-ante determinants of banking distress. The study made important contribution to the literature on Early Warning indicators of banking failures.
Hirtle and Lopez (1999) examine the usefulness of past CAMEL ratings in assessing banks' current conditions. They reported that the current public information and the private supervisory information contained in past CAMEL rating provides further insight into bank current conditions. They concluded that, over the period from 1989 to 1995, the private supervisory information gathered during the last on-site examination remains useful with respect to the current conditions of banks for up to 6 to 12 quarters (or 1.5 to 3 years).

Curry (1997) found that 74 percent of the banks that failed from 1980 to 1994 held three, four or five composite ratings two years prior to failure. This indicates the fact that such ratings provide EWS with respect to risk of failure. Another important indicator of failure, impinging on the capital requirements of a bank is earning performance, liquidity position and asset quality. Banks with a high proportion of non-performing loans to total loans are forced to make higher provisions for loan losses, thereby reducing net earnings and, ultimately, capital. The relevant ratios often used to distinguish between failed and non-failed banks include: non performing loans to total assets, non performing loans to total loans and the allowance for loan losses to total loans.

The financial performance ratios capture the impact of leverage risk, credit risk, and liquidity risk- three risks that have consistently produced financial distress in commercial banks (Putnam, 1983; Cole and Gunther, 1995).

**Literature Review on Capital Adequacy**

Bank regulators have considered the maintenance of adequate capital by banks as one of the key parameters for its safety and soundness. Adequate capital is essential to maintain bank solvency and to allow bank growth, but as a source of funds it plays a minor role as compared to customer deposit or liability instruments. Capital’s ultimate purpose is to absorb loss, protect depositor’s funds and to protect temporarily losses of liquidity. Capital is the basis on which regulators set limit on lending, evaluates bank’s level of profitability and consequently its investment potential.
"C" is the representative of Capital (C) in the model and has been a ratio of primary capital adequacy. According to Estrella, et al., 2000; Tam and Kiang, 1992; Elliott, 1991; Looney et al., 1989; Lane et al., 1986; Martin, 1977) Capital commonly represent Capital to Assets. Eccher et al. (1996), Thomson (1991), Whalen (1991) and Sinkey (1978) employed an analogous ratio definition, but with a refinement to adjust for loan losses, which theoretically would account for some portion of related risk in the asset portfolio (Cantor, 2001).

Thomson (1991) analysed bank equity capital adjusted for the impact of post-contracting changes in the value of loans. He adjusted book equity capital by adding the reserve for loan losses and deducting past due and non-accruing loans and found it to be generally significant in the prediction of bank failure. Although this ratio was utilized as representative of bank capital, the inclusion of loan default disclosures in the calculation adds some support to the notion that these measures contain predictive ability. Research by Espahbodi (1991) included a ratio of reserves for possible loan losses to total loans.

The theoretical case for higher capital standards leading to greater risk assumption and possibly higher probability of failure is not clear-cut. Koehn and Santomero, (1980) and Kim & Santomero, 1988) showed that an increase in the required equity-to-total asset ratio by regulators might induce an increase or decrease in the portfolio risk undertaken by the bank. In a pair of studies, Furlong and Keeley (1989, 990) argued that the framework used in prior studies took the expected cost of deposits as a constant that is independent of the bank’s capital position or risk.

According to Karacadag and Taylor, (2000), the new Accord implies a shift away from stipulation of prescriptive capital adequacy standards (rule-based capital regulation) towards specification of capital adequacy based on quality and character of bank assets, competence of its management and the stability of the operating environment (process-oriented capital regulation). This assumes importance in the light of Greenspan’s (1998) observation that a bank with a nominally high capital ratio of 12 per cent normally would be characterised as “well capitalised”, given the Basle minimum CAR of 8 per cent. Yet, a 12 per cent ratio may be inadequate for the bank’s operating environment and risk profile, which may warrant a capital ratio of 15 or 20 per cent in the economic sense.
Shrives & Drew (1995) and Hancock & Wilcox (1993) found bank portfolios more sensitive to these shocks in the early 1990s than in the late 1980s. Berger and Udell (1991) found little support for a drop in lending related to risk-based capital. Evidence that the regulatory pressure was dominant for at least some banks comes from the work of Peek and Rosengren (1995), who, in their study, found that banks in New England, subject to a formal regulatory mandate to increase their capital ratios, reduced their loan portfolios significantly faster than banks not subject to such restriction, even after allowing for differences in capital ratios. The same conclusion finds support in the work of Wall and Peterson (1995).

According to Sinha (2004) Capital adequacy stipulations at the global level have become more demanding following the BASEL committee's initiative to introduce internal model based capital charge. He considered three alternative paradigms viz. Value at Risk (VaR), Expected Shortfall (ES) and Expected Excess Loss (EEL) that may be used to determine the capital as also the methodology for dealing with the granularity problem. He had also analysed Indian Banking Sector in respect of Capital Adequacy for the period 1996-97 to 2001-01 by using regression analysis. He came to conclusion that Tier 1 CRAR of Indian bank is positively related to operating efficiency, and negatively related to NPA. CRAR has a definite and positive link with operating efficiency. However, no definite relationship between CRAR and bank size could be found out from the analysis.

The new Accord is based on a three Pillar concept, where Pillar 1 corresponds to a Minimal Capital requirement, Pillar 2 stands for a Supervisory Review process and Pillar 3 concerns Market discipline. The revised Basel Capital Accord requires banks to meet a capital requirement for operational risk as part of an overall risk-based capital framework. Three distinct options for calculating operational risk charges are proposed (Basic Approach, Standardised Approach, Advanced Measurement Approaches), reflecting increasing levels of risk sensitivity. Operational risk has become an area of growing concern in banking. The increase in the sophistication and complexity of banking practices has raised both regulatory and industry awareness of the need for an effective operational risk management and measurement system. From the time of the release of the second consultative document on the New Capital Accord in 2001, the Basel Committee on Banking
Chapter 1

Supervision has established a specific treatment for operational risk: a basic component of the new framework is represented by Pillar 1, which explicitly calls for a minimum capital charge for this category of risk (Marco Moscadelli, 2004).

The rating-sensitive capital charges on credit risks under the new Basel Accord are likely to increase the volatility of minimum capital requirements, which may force banks to hold larger capital cushions in excess of minimum requirements. This claim was analysed by Esa Jokivuolle and Samu Peura (2001), on the basis of numerical simulations on hypothetical bank portfolios, in which the bank’s choice of capital cushion is assumed to satisfy a value-at-risk-type constraint. Their key findings could be summarised as follows:

I. The use of ratings in the new Basel Accord, and the resulting increase in the volatility of the risk-weighted assets, can have a considerable impact on banks’ precautionary capital cushions in excess of the new minimum capital requirements.

II. These cushions will affect the level of overall capital in the sector after the reform as well as banks’ choices between the standardised and the internal ratings based approach. The outcome will also depend on how the Basel Committee accounts for these effects in its final calibration of the risk weights.

III. The information content of banks’ capital ratios would have to be interpreted with more care after the reform. In particular, the way that bank capital cushions relate to banks’ underlying portfolio risks would depend on the regulatory capital approach banks are using.

According to Sinha (2000), the existing capital standard has many weaknesses, which makes CRAR of Indian CBs a difficult proposition. However, it is expected to change once the new framework is adopted. Given the emerging scenario, Indian Commercial Banks face two major challenges such as need to adopt RORAC framework that capital requirements are directly linked with the business decisions. This not only facilitates prudent decision-making but also ensures necessary capital allocation. Second challenge relates to PSBs is the task of mobilising resources to meet Tier 1 Capital requirements. The current legal provisions do not allow them to mobilize resources beyond 49% of total equity.
Introduction

Estrella et al (2000) examined the relationship between different capital ratios and bank failure, and found that the simple capital to assets ratio (leverage ratio) predicts bank failure as well as more complex risk weighted capital ratios over one-year or two-year horizons. In addition, they recommended using the simple capital ratio as a tool to provide a timely signal of the need for supervisory action.

Stiglitz (1999) has observed that capital adequacy standards are important and should remember that (a) behaviour is affected by franchise value as well as standard capital. Increasing capital requirements will lower franchise values and consequently encourage risk-taking and (b) high capital requirements by themselves can even increase risk taking, especially given the crude and imperfect risk adjustments made. As they do not take into account correlations between assets and do not uniformly take account of the correlation between credit and market risks for developing countries. Stiglitz therefore advocates a “dynamic portfolio approach”. This approach takes into account financial sector regulation from the perspective of risk management-managing the incentives and the constraints that affect financial entities’ exposure and its ability to cope with risk.

Review of Literature on Asset Quality

The purpose of a variable representative of assets (A) in CAMEL is to reflect the major asset (i.e., loans). This could include variables related to loan concentrations, risk and/or volume. Many of the previous studies used a loan volume ratio, as measured by loans to total assets (Thomson, 1991; Espahbodi, 1991; Whalen, 1994; Sinkey, 1975; Martin, 1977). Looney et al. (1989) measured loan quality as the ratio of commercial loans to total assets, while Thomson (1991) included the Herfindahl Index for different types of loans, including commercial and industrial loans. Tam and Kiang (1992) utilised different variables that are representative of different types of loans, including a measure of commercial and industrial loans to net loans and leases. Lane et al. (1986) found a measure of commercial loans to total loans and the log of commercial loans to total loans to be significant.

According to Ansari (2004), good quality of assets represents “maintenance of balanced portfolio with lowest possible risk and maximum capacity of value creation”. Banks should assure credit quality by granting credit with due diligence before disbursal of advances so that chance of bad loan can be minimised. Next
important element on the assets side is investment, which requires prudent management. In this regard banks should lay emphasis on liquidity, safety of principal, optimum return and minimum risk profile. The investment in banks should be analysed in terms of Value at Risk (VaR) and on Mark to Market basis.

Dhanuskodi (2006) has attempted to study the Non-Performing Assets (NPAs) in Commercial Bank of Ethiopia, the leading Public sector commercial Bank in Ethiopia. According to him the main challenge confronting the commercial bank is the disbursement of funds in quality assets (loans and advances) or otherwise it leads to non-performing assets. NPA is a double-edged weapon, which affects bank profitability due to interest income not being recognized on NPA accounts and loan loss previously to be created from profit earned. NPA not only reduces the yield on advances but also reduces the profitability as general provision is made based on management’s assessment of the inherent risk in the loans and advances portfolio. NPA is one of the major reasons for slight decrease in the level of ROA and ROE is the provision for doubtful debts account.

He also observed that the outstanding loans and advances are generally determined by the trends in fresh loan disbursement and loan collections, which in turn, are dependent on the performance of the overall economy. Generally, weak economic performance, disbursements of fresh loans and collections of loans tend to slow down. This reduction in loans and advances was caused partly by the weak economic and business condition and partly by the relatively stringent credit decision procedures and tight regulation in extending new loans. The bank must adopt structured NPAs management policy for elimination or reducing the NPAs. He further came with suggestions for reducing the level of NPAs such as (i) large exposure on big corporate or single project should be avoided, (ii) operating stafﬁs’ credit skills should be up graduation, (iii) prospective client loan should be based on trends of capacity utilization, proﬁtability, (iv) bank should check diversion of funds by the customers and (v) effective inspection system should be implemented.

Reddy (2002), has conducted a comparative study of Non Performing Assets in India in the Global context. He analysed the experiences of other Asian countries in handling of NPAs. He further looked into the effect of the reforms on the level of
NPAs and suggests mechanisms to handle the problem by drawing on experiences from other countries.

The Narasimhan Committee II, has pointed out that past problems faced by banks are due to time consuming legal impediments, ignoring of problems to report higher earnings, manipulation by the debtors using political influence at the time of asset disposal process and lack of strict prudential norms. (Gol, 1998). He further argues that structures like the Keiretsus and Chaebols in Japan and Korea and the SOE’s in China were responsible for their countries NPAs problems. He suggested that Economic Value of Equity (EVE) (or Market Value) and Economic Value of Equity at Risk (EVER) are useful mechanisms to handle NPAs problem. Foreign experiences must be utilized along with a clear understanding of the local conditions to create a tailor made solution, which is transparent and fair to all stakeholders.

According to Ram (2002) a perverse effect of the slow legal process is that banks are shying away from risks by investing a greater than required proportion of their assets in the form of sovereign debt instruments.

Muniappan (2002 a) argues that there is a fear that disposal through the provision of excessive reserves may result in a deflationary spiral. A thorough provision of reserves will have no negative impact on the long-term dividends paid to shareholders. Muniappan (2002b) further emphasises that there has been a noticeable improvement in the financial health of banks in terms of asset quality. According to him pre and post reforms NPA levels are not strictly comparable as there has been a significant tightening of accounting norms. He further argues that the main culprits are not the priority sectors or public sector units, but the large industries. If government sops to agriculture and SSI’s are excluded, the NPAs in the priority sector are even lower. This fact could be justified from segment-wise distribution of Gross NPAs Amount presented in the following Table No 2.1.
Table No. 1.1: Segment-Wise Distribution of Gross NPA

<table>
<thead>
<tr>
<th>Borrowing Segment Wise Distribution of Gross NPA</th>
<th>Gross NPA on March 31, 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Amount (INR Crore)</td>
</tr>
<tr>
<td>PSUs</td>
<td>1334.05</td>
</tr>
<tr>
<td>Large Industries</td>
<td>11498.1</td>
</tr>
<tr>
<td>Medium Industries</td>
<td>8658.68</td>
</tr>
<tr>
<td>Other Non priority sectors</td>
<td>9516.62</td>
</tr>
<tr>
<td>Agriculture</td>
<td>7311.4</td>
</tr>
<tr>
<td>SSIs</td>
<td>10284.97</td>
</tr>
<tr>
<td>Other Priority sectors</td>
<td>6169.33</td>
</tr>
</tbody>
</table>

Source: Munippan G. P. (2002b) [see reference for details]

Diagram 1.1 Gross NPA on March 31, 2001 Percentage of Total NPA

Lee et al (2001) argue that the ‘structural strength of banks’ is relevant as it includes measures of accounting standards, definition and provisioning of NPAs and the quality of management. Mor and Sharma (2002) have argued that the current organizational competencies, regulatory framework, quality of disclosure and incentive structure produce an inconsistent framework, which leads to an unsustainable performance level for a Bank. Micro level issues will have to be addressed in order to root out the problems. Processes at every stage of an asset life affect the overall quality of the intermediation process. Thus, consistent sets of procedures are necessary.

Besides the above literature regarding NPAs and quality of assets various other researchers have pointed out various causes for NPAs. According to Kang (2001), protracted periods of interest rate control and selective credit allocations gave rise to an inefficient distribution of funds. In Japan, the government ‘big bang’ spending approach to pull the country out of recession had further aggravated the problem. Further, the focus of the government on increasing market share for profits and
pursuing little attention on diversification caused tremendous stress on the economy.

According to Ahn (2001), the speedy containment of systemic risk and the domestic credit crunch problem with the injection of large public funds for bank recapitalisation were critical steps towards normalising the financial system. Yamaguchi (2001) has argued that expansionary fiscal policy measures administered to stimulate the economy supported industrial sectors like construction and real estate, which may have further exacerbated the problem. In ESRI (2001) it has been reported that weak corporate governance coupled with a no bankruptcy doctrine was a moral hazard in Japanese economy.

Viswanathan R. (2002) argued that moving NPAs to an ARC doesn’t get rid of the problem. A significant percentage of the NPAs of the PSB’s are in the priority sector. Loans in rural areas are difficult to collect and banks by virtue of their sheer reach are better placed to recover these loans.

The Resolution Trust Corporation has helped in developing the securitisation market in Asia by taking over around $460 billion as bad assets from over 750 failed banks. Its highly standardised product appeals to a broad investor base. Securitisation in India is still in a nascent stage but has potential in areas like mortgage backed securitisation. ICRA estimates the current market size to be around Rs 3000 Crores. [ICRA, 2002]).

Narsimhan Committee Report (1998) vividly explains the impact of NPAs on banks and the economy. NPAs constitute a real economic cost to the nation as they represent the application of scarce capital and credit funds to unproductive uses. The money locked up in NPAs and simultaneously provisioning requirement for NPAs are not available for productive use as the extent that banks seek to make provisions for it or write them off, it is a charge on their profit.

NPAs are serious strain on the profitability of banks, as they cannot book income on such account. The funding cost and provision required are charge on profits. NPAs also carry 100% weightage and block capital for maintaining CRAR. To that extent this is a drain on the profitability of banks. (IIBF, 2004).
The issue of NPAs management continues to be the biggest challenge before the banking sector. One of the major constrains of the competitive efficiency of banks is the tendency to accumulate poor quality of assets. Nothing is a truer indicator of the quality of assets then the incidence and quantum of NPAs in relation to the total portfolio (Muinappan, 2003).

A majority of the studies examined only four of the CAMEL factors and excluded a representative measure for Management and System & Control as it is the most difficult to measure.

**Review of Literature on Management**

The variable (M) for researchers in the development of CAMELS model is representative of management quality Sinkey (1975) purported that a specific ratio representative of management is difficult to identify, but his view was that many ratios are proxies. Often, researchers (Tam and Kiang, 1992; Espahbodi, 1991; West, 1985) have not attempted to include a variable to represent management quality. Thomson (1991) and Whalen (1991) employed the ratio of overhead expense to total assets as representative of management operating efficiency. As none of the ratios from previous research exhibited significance, further examination was warranted in the current study to choose a measure. They further argued that a loan growth measure was chosen to represent management quality. This selection transpired based on the notion that, as the loan total increases, the likelihood of the inclusion of relatively higher risk loans in the portfolio also increases. However, this provides some limited measure of management quality.

Wahlen (1994) notes that managers have different levels of discretion in relation to loan default disclosures. Risks related to loan default disclosures are composed of some discretionary components allowing managers certain choices (e.g., with respect to the timing and amount of loan write offs). For example, managers have discretion in the timing of charges for loan loss provisions; limited discretion to affect the level of non-performing loans and less discretion related to loan charge offs.

A review of bank failure literature by Looney et al. (1989) reports that major factors associated with bank failures included loan losses, deteriorating loan quality, loan/collection policies, other policies/practices, fraud and illegal acts, excess
Introduction

operating expenses, brokered deposits, run on deposits, insufficient capital, a weakened local economy are thus indicative of management incompetence.

Krause et al., (1988) argued that various loan related factors recur as a theme in the explanation of failure. The category of management incompetence included managerial shortcomings, inadequate supervision of loan portfolios, lack of control over operating expenses and overly aggressive strategies for loan and deposit growth.

The usefulness of loan default measures exists in a study by Tam and Kiang (1992). They examined a small sample of Texas banks, where results indicated two measures of loan default risk that were significant in their prediction of bank failure. Kolari et al. (2000) developed models and predicted bank failure, where the models initially included three measures of loan default disclosure along with 25 other financial measures. The loan default measures included allowance for loan losses to total assets, net loan charge-offs to total assets and provision for loan losses to total assets. In the final analysis, the allowance for loan losses to total assets was significant in two of the six predictions.

Shrieveres and Dahl (1992) pointed out that managerial risk aversion might influence banks' capital structure. Most individuals are thought to be risk-averse, and there is no good reason for thinking that bank managers are more risk averse than the average shareholder. However, bank managers have proportionately far more of their total wealth (including human capital) invested in their bank than do most shareholders, and, as a consequence, managers have more to lose from the bank's failure. Thus, bank managers may choose higher capital levels, given their risk exposure, than would be optimal from a shareholders' perspective.

Review of Literature on Earnings, Operational and Costs Efficiencies

The purpose of the earnings (E) measure in CAMEL is to provide a ratio representative of management's level of effectiveness in utilization of assets to earn profits. There exists a rich array of literature on assessing performance of banks using measures such as earning productivity and cost efficiency with the help of various methodologies. Past research provides a general supportive consensus for

Elvia & Bansal (1993) have adopted the regression model and empirically stated that reserve requirements, bank rate, lending to priority sector at a lower rate of interest, unprofitable expansion of bank branches in rural areas are the major determinants of profits and profitability of public sector banks in India.

Other studies relating to financial performance of banks have been conducted. For example, Varghese (1983) conducted an in depth study on profits and profitability of commercial banks during the decade 1970–79. The major issues analysed by her were whether there has been actually declining trend in the profits and profitability of Indian Commercial banks in the seventies, using various determinants of profits and profitability of Indian commercial banks during this period.

Mishra (1992) analysed the profitability of scheduled commercial banks in India taking into account the interest and non-interest income, interest expenditure, manpower expenses and other expenses. He concluded that the growing pre-emption of funds in the forms of SLR, CRR faster increase of expenses as compared to the income, advances and total investment than interest income and few more factors have contributed to the declining profitability of commercial banks.

Parasuraman (2001) had made attempt to measure the performance of major banks in India in the year 1998-99 under the criteria of EVA. The study found that ranking of banks under Return of Assets assumes close resemblance to the ranking under EVA, whereas the ranking under other criteria like total income, interest (as percentage of total) spread, and net profits do not match with the ranking under EVA. Srivastatva (1999) studied scale and scope economics estimated from a Stochastic Cost Frontier and found that there are substantial economies of scale and scope in Indian banking at the branch level.

Das (2002) has studied the interrelationships among Capital, Non – Performing loans and productivity using data on public sector banks for the period 1995-96
through 2000 – 2001 and found that these three parameter are intertwined and have significant impact on earnings.

Koeva (2003) examined a variety of financial indicators of banks and concluded that ownership has a significant effect on some of the performance indicators and deregulation has led to lower intermediations cost and profitability. Bhaumik and Dimova (2004) studied performance in terms of return on assets of all banks and conclude that by 2000, competition had helped public banks to reduce the gap in performance that existed between them and private banks.

Chatterjee and Sinha (2006) have compared the performance of Commercial Banks in the period of reforms with respect to lending in a cost minimization framework using Data Envelopment Analysis (DEA) – a non-parametric method. They found that the mean cost efficiency of Commercial Banks significantly declined in 2002-2003. They also observed that private sector commercial banks exhibited higher mean cost efficiency than public sector commercial banks. The public sector commercial banks lagged behind the private sector banks both in respect of technical and allocative efficiency. According to them this may be due to lending aversion behaviours of public sector banks in the current regulatory business environment framework that penalises the commercial banks heavily for low asset quality and provide little facility for the recovery of dues from the defaulting borrowers.

Singh I. and Kumar P., (2005) in their study have analysed performance in terms of efficiency in banking system by adopting production approach (assuming Labour, borrowing and deposit as input and Loans, investment and other income as output) and intermediation approach. With regard to borrowing by SBI and its group has the highest relative efficiency followed by nationalized banks and foreign banks. The average input use efficiency of borrowing is the lowest in case of Private Sector Banks. Same trend is noted in the terms of efficiency of staff use. They also came to conclusion that technical efficiency during the reform period of the public sector bank is much better than private banks and are comparable to foreign banks. In case of PSBs, technical efficiency is not only high but also a relatively consistent. Foreign banks have the highest allocation efficiency followed by PSBs. They finally concluded that in terms of overall economic efficiency PSBs are still
better than the private sector banks. PSBs are inefficient is based on a piecemeal analysis in the form of simple, static, partially isolated ratios. The urgent need of time is to adopt system wide analysis to explore the intricacies of the complex system that has grown over year.

Das (1997) estimated the technical, allocative and scale efficiency of SCBs for various pre-reforms years: 1970, 1978, 1984, 1990 and 1996 making use of DEA. The study considered the net income and interest income of banks as two outputs. The inputs used in the calculation of various efficiency measure as labour and loanable funds i.e. deposit plus borrowing. He computed the efficiency measure in respect of the PSBs, which indicated that SBI have improved its overall efficiency during the period of study. Nationalised banks have registered a gradual decline, which is more pronounced after 1990. This has been so due to poor performance of some of the Nationalised banks such as The Indian Bank, The United Bank of India, The Andhra Bank and The Punjab & Sind Bank. He further came to conclusion that the inefficiency was technical in nature and is an indicator of under utilization or wastage of resources.

Further Sarkar et al (1998) analysed the performance in terms of financial ratios of efficiency and profitability and concluded that private banks are not unambiguous superior to public banks. Sarkar and Bhaumik (1998) studied the presence of bank competition in Indian states during 1980 to 1998. They found that competition form foreign bank is very small compared to the established presence of PSBs.

Saha and Ravisankar (2000) examined the efficiency of the Indian PSBs in two phases during 1992-1995. In the first phase they considered ratios such as deposit to establishment expenses, advances to establishment expenses deposits to staff expenses and advances to staff expenses. Banks were plotted on two-dimensional graphs. The inputs considered for such purpose were interest expenditure, establishment expenditure and non-establishment expenditure. Simultaneously outputs considered were deposits, advances, investments, non-interest income, interest spread and total income. The results obtained indicate that the performance of the PSBs has improved over the period of study with few exceptions.

Das A. et al (2005) examined the output oriented technical efficiency, cost efficiency, revenue maximisation efficiency and profit efficiency of different
groups of Indian Banks. For the period of study 1997-2003 he considered four inputs viz. borrowed funds, number of employees, fixed assets and equity. They concluded that the banks in India are still not much differentiated in terms of input or output technical efficiency or cost efficiency. There is wide range of variation in terms of revenue and profit efficiencies.

Kumbhakar and Sarkar (2004) estimated efficiency of public and private banks using a stochastic cost frontier with data from 1986 to 2000. They found that cost inefficiency has declined over time, but the rate of declined slowed down after the reforms. They also found that private banks are more efficient than PSBs but there is no significant difference in the impact of deregulation on the two banks group. However, this study did not study foreign and new private banks. Moreover it did not estimate profit efficiency. Neither did it inspect the role of size in determining efficiency. The only other relevant study is by Shanmugam & Das (2004) estimated various production efficiency measures for Indian banks. Banking being as multi-product industry, it is difficult to specify a unique production frontier. Hence in the absence of proper knowledge of the production technology of banks it may be better to estimate cost and profit efficiencies, which rely on estimated cost and profit functions of banks.

Review of Literature on Liquidity

Substantial literature exists on investigating the importance of liquidity for asset pricing, credit risk, financial market development, option pricing, microstructure, and central bank behaviour. The banking literature emphasises funding liquidity shocks of banks due to early withdrawals by their customers. The role of banks is to insure across customers' time preference shocks by investing in projects and assets with the right maturity structure.

A liquidity ratio measures an entity's ability to pay its short-term obligations out of liquid assets. Liquidity (L) was generally represented in previous studies with a ratio of cash (with some adjustment for short-term liquid securities) to total assets (Tam and Kiang, 1992; Espahbodi, 1991; Lane et al., 1986; Martin, 1977; Sinkey, 1975).
Chapter 1

The existence of banks as providers of liquidity is central to modern banking theory. According to Bryant (1980) and Diamond & Dybvig (1983) banks are subject to bank-runs if they offer demand deposit contracts when markets are incomplete. In the case of a bank-run, they are forced to liquidate long-run investment projects at a low liquidation value. Most of the banking literature follows Diamond and Dybvig in assuming an exogenous liquidation technology i.e. market liquidity is not endogenous. They equally show how a particular equilibrium of the game involves a bank run, where both patient and inpatient depositors withdraw their holdings.

Allen and Gale consider a banking model in which the sell-off of the bank's long-run asset may depress its liquidation value, and analyze the implications for bank-runs (Allen and Gale, 1998), constrained Pareto efficiency (Allen and Gale, 2004) and fragility of equilibria (Allen and Gale, 2005). They identify three important ways in which the possibility of a bank run affects the growth process: (i) agents tend to lower their participation in the banking system, creating a dis-intermediation effect, (ii) banks tend to adjust their portfolio of investments towards more liquid, less productive assets, and (iii) when a bank run occurs, early liquidation of investment reduces capital formation. These three effects make both the occurrence and the mere possibility of bank runs detrimental for economic growth.

Shleifer and Vishny (1992) show, within a corporate finance context, that a funding crisis can lead to "fire sales" of machines since potential buyers of these industry-specific machines also face similar funding problems at the same time.

Kashyap et al (2000) have indicated that banks also provide liquidity to borrowers. If the liquidity demands on both sides of the balance are to some extent negatively correlated, important synergies can be exploited from a single buffer stock of liquid assets. These synergies allow banks to provide liquidity cheaper than any other "single product" operator in the market, and hence economies of scope existing in the production of liquidity constitute an additional explanation for the emergence of banks. They further documented by empirical observations that this may lead to increased bank borrowing going hand in hand with more depositors turning to banks for providing a safe haven to their funds. The reason for firms to borrow
more against their credit lines with banks follows from the higher interest rates paid on their securities placed in the open market in periods of turmoil.

Cifuentes et al (2005) explores liquidity risk in a system of interconnected financial institutions when these institutions are subject to regulatory solvency constraints and mark their assets to market. When the market’s demand for illiquid assets is less than perfectly elastic, sales by distressed institutions depress the market prices of such assets. Marking to market of the asset book can induce a further round of endogenously generated sales of assets, depressing prices further and inducing further sales. Contagious failures can result from small shocks.

Holmström and Tirole's (1998, 2001) research focuses primarily on funding liquidity. They show that corporations with agency problems have a preference for government bonds because they provide a cushion for future funding liquidity problems. Hence, government bonds trade at a premium.

Uyemera G.D., Deventer D.R., (1993) documented that Gap Analysis is also referred to as net liquid asset. A negative liquidity gap means that assets readily convertible into cash may not be sufficient to cover the near term rate sensitive liabilities.

Bangia et al (1999) in their paper point out that the endogenous liquidity risk measurement models, although they are conceptually attractive, may not be objective because of there is no readily available data source that shows the relationship in between trade size and both the quantity discount and execution lag. Moreover, if the market order to buy/sell is smaller than the volume available in the market at the quote, then order transacts at the quota.

According to Hara (2004) liquidity occupies a central importance for many areas of finance. But there are very disparate views of liquidity, and correspondingly many different policy implications attached to these views. He considered many faces of liquidity and their implications for financial market stability. He focus on the traditional economics view of liquidity as destabilising and the more positive microstructure view of liquidity as a positive attribute for both traders and markets and outlined the various policy prescriptions for market stability that arise from
these disparate views, and how they relate to current market developments. Secondly he considered a new view of liquidity deriving from the new research on uncertainty aversion and its implication on market stability. He argued that traditional approaches to liquidity are misguided. The view that liquidity is a negative feature of markets and must therefore be constrained is ill conceived. From a microstructure perspective, policies to enhance liquidity and the free flow of capital will enhance market stability.

Another liquidity concept, funding liquidity, is studied in the corporate finance literature. This literature explains how funding liquidity problems arise because of agency problems combined with contract and market incompleteness (Hart, 1995)

Review of Literature on System & Control

“S” which represents “System & Control” was incorporated in the original CAMEL Model. Substantial literature on this model is still not available. Most of the studies on performance evaluation of the banks consider first five parameter of the model. An attempt has been made in the study to consider the sixth parameter for the performance evaluation of Nationalised Commercial Banks.

Over the last few decades, both developed and developing economies have witnessed a spate of financial crisis spearheaded by failure in the banking system (Debasish S.S, 2004). A typical way to address the issue is to tighten prudential supervision. At least four types of risk exist for banks: interest rate risk, operational risk, credit risk and reputation risk (Estralla et al, 2000). These risks can be mitigated not only by regulatory actions but also by adequate internal system and control measures i.e. efficient Operation Risk Management (ORM). ORM take care of the aforesaid risks through prudential regulations and market discipline as it includes parameters such as vulnerability parameters, profitability and cost efficiency.

As a reflection of present general views of a present framework for regulation and supervision of banks, Mingo (2000) asks, “How should bank “soundness” be .......... quantified.” Flannery (2001) had rightly observed that market discipline might be able to supplement traditional supervisory assessments to distinguish’ good’ banks from ‘bad’ one and therefore, lower overall social cost of banks
supervisions. According to Berger et al. (1991), market discipline may improve the efficiency of banks by pressurising some of the relatively inefficient banks to become more efficient or to exit the industry. Martinez Peria and Schmukler (2001) have reported that even small, insured depositors exert market discipline by withdrawing deposits form weak banks.

Krause et al. (1988) historical summary reports that managerial weaknesses for failed banks include inadequate supervision of loan portfolios and overly aggressive strategies for growth in loans and deposits. Historically, the primary area of risk for bank losses exists in credit losses (Cantor, 2001). Although Estralla et al. (2000) note that “it is difficult to evaluate credit risk,” an argument can be made that the loan default disclosures proxy for credit risk and in addition may also provide an indication of operational risk related to management decision making.

Iqbal et al. (1998) reported that effective market discipline also requires an appropriate and standardised accounting framework and disclosure policies with respect to assets, liabilities and income statements of banks. According to Chapra and Khan, 2000 operational risks arising from the breakdown of internal controls and corporate governance can also lead to shortfalls in a bank’s net income or cash flow as compared with that expected or targeted, and thus create problems for management. Most research works identify the failure of risk management and internal control systems as the primary causes of financial crises (BCBS, Framework for Internal Controls in Banking Organizations, BIS, 1998)

Fischer (2002), has rightly observed that “the common objectives of all official supervisors is to maintain a strong and vibrant financial system and to achieve this, it is necessary that banks, banking supervisors and other market participants become more discriminating in their approaches to risk and better equipped to anticipate problems before they turn into crises”. In this backdrop we can see that the “CAMELS Model” takes into account all the variables that are essential for a commercially viable strong bank. Thus, for the performance evolution of Nationalised Commercial Banks the model has been considered for the study.
V. Objectives of the study

As a result of the recommendations of the Committee on the Financial System (1991) the introduction of prudential regulations in India since 1992-93, has ushered sea change in the financial performance and regulatory framework. The regulatory structure has gradually been tightened over the years with avowed objectives of moving towards the best international practices but relatively little attention have been paid towards assessing the overall financial performance. This gap cries out to be supplemented with rigorous empirical research with a view to act as a guiding force for any further modification in the existing mechanism.

The objective of the study is to conduct the performance evaluation of Nationalised Commercial Banks (NCBs) in India in the post liberalisation scenario by using CAMELS Model during the period of the study (1999-2000 to 2004- 2005). For the purpose of conducting performance evaluation of banks, CAMELS based ratio has been used, as these ratios are indicators of overall financial strength of banks. The Model as already mentioned, covers wide range of financial parameters for financially solvent banks. These ratios act as indicators of forth-coming risk and likelihood of a bank’s failure. The objectives of this study are as follows.

i. To evaluate the financial health of the NCBs using CAMELS Model.

ii. To analyse position of capital adequacy in the NCBs

iii. To analyse the status of Assets Quality in the selected banking group.

iv. To analyse the level of earning status of NCBs.

v. To assess the quality of banks’ management in terms of their operational and technical efficiency.

vi. To find out the degree of liquidity in NCBs

vii. To review compliance with prudential norms and supervisory ratios.

viii. To identify different areas of unsatisfactory operational performance.

ix. To suggest measures to improve financial health and productivity of NCBs
VI: Hypotheses

# 1  Capital Adequacy Ratio of NCBs in India is at par with the International standard

# 2  Assets' Quality of NCBs has significantly improved significantly over the year.

# 3  Management of NCBs has been supportive to productivity and growth and efficiency.

# 4  Earning and efficiency of the NCBs has significantly increased over the years.

# 5  NCBs in India have maintained adequate liquidity during the period of study.

# 6  Compliance with prudential norms and supervisory ratios has been satisfactory in the NCBs.

VII: Scope of the study

As mentioned earlier, banks serve as engine of economic growth. They are both the storehouse of the community's savings and the supplier of credit for economic activities. Thus, banks mobilise surplus resources with the people for economic development.

Nationalised Commercial Banks have greatly assisted in national planning through mobilisation of substantial resources and disbursed them according to five years plan priorities and objectives. About four decades since the nationalisation of banks in India, critics of nationalisation policy have raised the issue of poor performance of these banks in terms of low profitability, low productivity, inefficiency and mounting level of NPAs.

Along with liberalisation in the real sector, financial sector is gradually being liberalised in order to complete the process of overall liberalisation in the country. Further, safety of banking is essential to maintain the confidence of the public in the banking system. Banks have to comply with international prudential measures.

Given the significance of banking as a catalyst of economic development, commercially variable banking system is of paramount importance. National
importance of NCBs in India cannot be down played as it covers the major share of total banking business, in terms of geographical outreach and volume of business.

The scope of financial soundness of banks is very wide and broad based. The study based on performance evaluation of Nationalised Commercial Banks, highlights the key financial aspects that an analyst should be interested in viz. capital, asset quality, earnings and liquidity. The CAMEL based parameters specify the standards against which to evaluate the performance of an individual bank, as well as of the industry.

In this backdrop the parameter selected in the Model plays a very significant role because it covers comprehensive approach towards Capital, Asset Quality, Managerial performance, Earnings and Liquidity that are essential for financially strong banks.

VIII. Period of the study
The period of study for this research work is confined to 6 years from the financial year 1999-2000 to 2004-05. The actual banking sector reforms in India took place in two phase viz. (i) First Generation Reforms which initiated in the year 1991 with the appointment of Narshamam Committee I and (ii) Second Generation Reforms in India in 1998 headed by same person to conduct review of the earlier reforms and suggest further reforms. Since the second phase of reforms in banking sector was introduced in 1998, the year 1999-2000 was selected as the base year for the study period. The year 2004-2005 was chosen as the concluding year of the study period owing to non-availability of latest relevant data afterwards.

IX. Research methodology
There are 27 PSBs, which include 19 NCBs and 8 SBI and its associates. Bearing in mind the national importance of Nationalised Commercial Banks in India in terms of geographical outreach, volume of business share and as a medium to accomplish government objectives various points were raised by critics of nationalisation questioning the performance and sustainability of PSBs and particularly nationalised commercial banks. This study is confined to all the 19 Nationalised Commercial Banks in India.
A. Sources of Data

The main source of data used for the study is secondary in character. Basically, data used for the study were collected from the various publications of Reserve Banks of India such as Statistical Tables Relating to Banks in India, Profile of Indian Banks, Reports on Trends and Progress of Banking in India etc. The official websites of Reserve Bank of India (www.rbi.org.in) was also referred for the purpose. Annual reports of banks under study were also collected to draw a clear picture of financial performance. IBA bulletin, books, periodicals, journals etc relating to the subject were also referred. For the purpose of analysis most of data have been collected from statistical tables published by RBI for the period, under review. Some of the ratios already computed and published by the RBI have also been used directly besides researcher’s own computations using MS-Excel Spread Sheets.

B. Tools and techniques of analysis

In order to complete the proposed research, “financial analysis” was carried out using accounting and statistical tools such as trend analysis of computed ratios, tabular analysis, comparative charts and ranking scales.

Bank specific ratios such as Capital Adequacy, Asset Quality, Management, Earnings, Liquidity and System & Control aligned with the predetermined objectives have been used to analyse performance of NCBs. For more comprehensive analysis under each broad categories mentioned above different sub-ratios have also been used which are mentioned in the following Table Nos. 1.I to 1.VI. These ratios were assigned rating on a scale of “1” through “5” that has been indicated in the following table.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Designation/Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale 1</td>
<td>Strongest performance</td>
</tr>
<tr>
<td>Scale 2</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>Scale 3</td>
<td>Fair</td>
</tr>
<tr>
<td>Scale 4</td>
<td>Marginal</td>
</tr>
<tr>
<td>Scale 5</td>
<td>Unsatisfactory (Weakest Performance)</td>
</tr>
</tbody>
</table>

For the purpose of efficient analysis excel based models were designed for each broad category of ratios and sub ratios using MS-Excel spreadsheet and data were punched accordingly.
After computation of the ratios on the basis of CAMELS Model these ratios were used for ranking on the scale of 1 (Financially Strongest Performer) to 5 (Financially Weakest Performer). Financial analysis for banks performance evaluation has been conducted using pre-set ratio benchmarks for each performance variables. For this purpose benchmark were assigned to each category of ratios except for ratios that are internationally prescribed⁹.

Conditional formatting of the spreadsheet was carried out for the entire ratio within each performance category on the scale of “1” to “5” according to preset benchmark. Thus, scores were derived automatically for six years period under study. Overall ranking for each performance variable was derived by consolidating data for the period of study using rules of simple average. These average ratios were again benchmarked to find out consolidated scores for the six-year period under study on the same scale.

Banks were ranked individually on the basis of each performance variable by using rank sum techniques. Finally all the performance variables scores were aggregated to compute overall CAMELS' rank sum to arrive at the banks composite rating.

Graphs and diagrams are also used to illustrate facts and figures wherever necessary. Different performance variables that have been used for the performance evaluation of NCBs have been discussed in the following pages.

C. CAMELS Model Ratios
All the variables and sub variables used in the Model selected for the purpose of this research work have been discussed in the following Table No1.II to 1.VII

a. Capital Adequacy
Adequacy of capital is essential for safety ad soundness of banks besides ensuring regulatory compliance. Bank supervisors have set minimum capital requirements for banks that act as a cushion against capital erosion. The banks not complying with the supervisory /regulatory capital should be identified and prompt corrective action must be initiated to any casualties of affected banks. Various ratios that can

⁹ Basel norms have set standard for Capital Adequacy Ratios, Return on Assets and Non Performing Assets
be used for analysing adequacy of capital in banks have been discussed in the following Table No. 1.II.

**Table No 1.II: Capital Ratios**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Definition / interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total capital to total weighted assets (CRAR) (CRAR comprise of tier I plus tier II capital, of which tier II should not exceed 100 per cent of Tier I)</td>
<td>These ratios express the primary and regulatory capital as a percentage of the total risk weighted assets. They indicate the margin of protection available to both depositors and creditors against unanticipated losses that may be experienced by the bank. Thus, they reflect the banks resilience to economic difficulties. Presently minimum stipulated limit is 9%.</td>
</tr>
<tr>
<td>2.</td>
<td>Tier I Capital</td>
<td>Comprising equity capital and published reserves from post-tax retained earnings. It is the regulatory capital and is used to set the trigger. It is used to calculate the leverage ratio for the banks. (Tier I Capital to Total Assets.). Minimum stipulated limit is 4.5% of CRAR.</td>
</tr>
<tr>
<td>3.</td>
<td>Tier II Capital</td>
<td>Comprising perpetual preferred stock, loan loss reserves, sub-ordinated debt, etc. It should not be more than 100% of Tier I Capital.</td>
</tr>
<tr>
<td>4.</td>
<td>Ratio of Tier II Capital to Tier I Capital</td>
<td>The ratio is computed by dividing Tier II capital by Tier I Capital. The ratio is used to compute the extent of financial level of regulatory capital.</td>
</tr>
<tr>
<td>5.</td>
<td>NPAs to Net worth NPAs/ (Equity capital + Share premium + Statutory reserves + retained earnings + revaluation reserves + general reserves + P &amp; L)</td>
<td>Measures the severity of non-performing loans in relation to shareholders’ equity. It provides a useful insight to the extent to which shareholders equity is being eroded. Lower the ratio better the situation for bank.</td>
</tr>
<tr>
<td>6.</td>
<td>Net Worth to Assets</td>
<td>The simple capital to assets ratio of banks and this indicates the extent of leverage enjoyed by banking sector. The lower the leverage the more the vulnerable is the bank.</td>
</tr>
<tr>
<td>7.</td>
<td>Debt to shareholders’ equity: (Term Deposit and secured borrowing) / (Net Worth)</td>
<td>Measures the basic net worth of an institution. Also referred to as the leverage ratio. This ratio has to be carefully utilised for the purpose of analysis as it works like a double edge weapon. Though thumb rule is 2:1 but for banking business this may be very high as banks accept deposits to fund its operations. In banks assets are carved out of liabilities.</td>
</tr>
</tbody>
</table>

**b. Assets’ Quality**

Asset Quality is indicative of balanced portfolio with the lowest possible risk and maximum value creation. Good quality assets protect banks against risk of capital erosion. Major portion of bank assets are block in form of loans & advances, which are carved out of liabilities. NPAs block the costly funds of banks in bad debts and provisioning requirement due to classification of these assets as NPAs. NPAs have opportunity cost and at the same time they affects profit-earning opportunities of banks. Bankers must be satisfied that they establish and adhere to adequate policy practices and procedures for evaluating the quality of assets and adequacy of loans loss reserves. The NPAs are required to classified into standard, doubtful and loss
assets depending on the age of irregularity and provisions are required to be made taking into account the potential threat to realisability of the asset. Various ratios used for analysing the asset quality have been discussed in the following Table No 1.III.

**Table No 1.III: Asset Quality Ratios**

<table>
<thead>
<tr>
<th>S.N</th>
<th>Ratios</th>
<th>Definition/Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Gross NPAs Ratio</strong>&lt;br&gt;(Gross NPAs to Gross advances)</td>
<td>Loans and advances usually represent the single largest asset of most banks. Thus monitoring the quality of the bank’s loan portfolio is of the utmost importance. The greater the ratio, the higher the credit risk the bank is exposed to.</td>
</tr>
<tr>
<td>2.</td>
<td><strong>Net NPAs Ratio</strong>&lt;br&gt;(Net NPAs to Net Advances)</td>
<td>This ratio also indicates the quality of loan banks maintain in their portfolio. The sum of substandard, doubtful and loss on loan and not of provisions made for such loans, expressed as a percentage of net advances. The greater the ratio the higher the credit risks the banks are exposed to.</td>
</tr>
<tr>
<td>3</td>
<td>Non performing loans to Total Assets</td>
<td>Indicates the percentage of total assets that have deteriorated and have been classified as a percentage of the banks total assets portfolio. Where loans are a significant portion of total earning assets an increase in this percentage can seriously hinder the earning capacity of the bank</td>
</tr>
<tr>
<td>4.</td>
<td>Earning Assets to Total Assets</td>
<td>Earning assets include sum of Balances with banks abroad, net loans, approved securities, bills of exchange etc. The ratio is indicative of the proportion of the banks’ assets that can be relied upon to generate income for the banks. A high level of earning assets indicates good quality.</td>
</tr>
<tr>
<td>5</td>
<td>Loan Cover Ratio&lt;br&gt;(Provisions for NPAs to Net NPAs)</td>
<td>A test of the adequacy of the allowance for loan losses. It reflects the extent to which the bank recognises how badly its total loan portfolio has been impaired.</td>
</tr>
</tbody>
</table>

c. **Management Appraisal**

The Rating on Management (M) takes into account the effectiveness of the management in ensuring productivity and operational efficiency. It is also indicative of control exercised by the head /controlling offices. Two parameters of ratios have been fixed to evaluate managerial control ability and are (A) productivity ratios, and (B) operational efficiency ratios. However, other ratios used in the CAMELs Model are also indicative of managerial control ability. Different ratios that have been considered to evaluate the productivity and operational efficiency of management are discussed in the following Table No. 1.IV
Table No 1.IV: Management Appraisal Ratios

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Definition /Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Business Per Branch</td>
<td>Advances plus deposits at the end of the year / Number of Branches. Higher level of ratio is indicative of good managerial efforts to increase the business volume per branch. Increase in the ratio is also indicative of revenue efficiency.</td>
</tr>
<tr>
<td>2.</td>
<td>Business Per Employees</td>
<td>Advances plus deposits at the end of year divided by the total number of employees. Higher ratio is also indicative of managers’ success in managing manpower to increase the business per branch. Increase in the ratio is also indicative of labour efficiency.</td>
</tr>
<tr>
<td>3.</td>
<td>Operating Profits Per Branch</td>
<td>Operating Profits at the end of the year / the number of branches. Higher ratio is also indicative of good operation management in bank. Increase in the ratio is also indicative of profit efficiency.</td>
</tr>
<tr>
<td>4.</td>
<td>Operating Profits per Employees</td>
<td>Operating profits at the end of the year / total number of employees. Increase in the ratio is also indicative of operational productivity of banks.</td>
</tr>
</tbody>
</table>

B: Operational Efficiency

<table>
<thead>
<tr>
<th>1</th>
<th>Non-Interest Income to AWF</th>
<th>Non Interest Income expressed as a percentage of the Average Working Funds (AWF). A higher level of ratio is indicative of managerial dynamism in raising income through fee-based services and explore new sources of revenue generation.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Interest income to AWF</td>
<td>Interest Income divided by the Average Working Funds (AWF). This ratio is indicative of manager’s ability in generating income from regular business activities.</td>
</tr>
<tr>
<td>3.</td>
<td>Cost Income Ratio (CIR)</td>
<td>CIR is calculated as ratio of operating expenses to net total income (total income less interest expenses. The ratio is commonly used as an indicator of a bank’s efficiency. A low ratio is indicative of a more efficiently managed bank. Increase in the ratio is also indicative of operational efficiency. Normally a ratio of 0.6 is an indicative benchmark.</td>
</tr>
</tbody>
</table>

d. Earnings

"E" in the model represents earning and profitability banks. The rating of banks on the Earnings parameter is significant because sustained high level of profitability enable a bank to boost its capital and improve its economic performance. There is negative relationship between profitability and the probability of failure. Different kinds of ratios that are used for the purpose of analysis have been discussed in the in the following Table No: 1.V
Table No. 1.V: Earnings Ratios

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Definition / Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Return on Assets (RoA)</strong> (Income before tax/ Total Assets)</td>
<td>RoA is one of the widely employed measures of profitability. It is indicative of net income generated from the employment of the total assets of the banks. A bank with a higher return on assets is inherently sounder than one with a lower ratio. A bank operating on sound commercial line is expected to exhibit a healthy RoA.</td>
</tr>
<tr>
<td>2</td>
<td><strong>Return on Equity (RoE)</strong> (Income after tax/shareholders equity)</td>
<td>Measures the rate of return on the shareholders equity investment. Higher ratio is indicative of banks' ability to use shareholders funds in generating return.</td>
</tr>
<tr>
<td>3</td>
<td><strong>Spread to Total Interest</strong> (Total interest income minus total interest paid/total interest income)</td>
<td>Identifies and evaluates the core earning capacity of bank. Optimising this ratio is one of the objectives of ALM. A declining ratio is an important indicator of treasury management problems that require attention. Higher ratio is indicative of bank's ability to generate profit from interest income.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Net Interest Margin (NIM)</strong> (Total interest income minus total interest paid/total Assets)</td>
<td>NIM is useful for industry-wise comparison of different bank’s performance owing to varying size of banks. The greater the gap the more profitable a bank will be, with the reverse also being true.</td>
</tr>
<tr>
<td>5</td>
<td><strong>Loans Yield Rate (LYR)</strong> (Interest income from loans)/(Gross loans - non performing loans)</td>
<td>This is the effective return on the banks' investment in loans. Higher LYR is good for bank and indicates bank's earning capacity.</td>
</tr>
<tr>
<td>6</td>
<td><strong>Interest Income to Total Assets</strong></td>
<td>Measures the interest income generated from the employment of the total assets of the bank. A bank with a higher interest income on assets is inherently sounder than one with a lower ratio.</td>
</tr>
<tr>
<td>7</td>
<td><strong>Ratio of non interest income to total assets</strong></td>
<td>Indicates banks' earning from fee-based services. Fee-based activities include income from other sources such as bank guarantee, LC, Bill discounting etc.</td>
</tr>
</tbody>
</table>

e. Liquidity

Liquidity risks arise when there is an unexpected decline in a bank's net cash flow and the bank is unable to raise resources at a reasonable cost by either selling its assets or borrowing through the issuance of new financial instruments. This may make the bank unable to meet its obligations as they become due, or to fund new business opportunities. Sound liquidity management is, therefore, crucial for banks to avoid serious liquidity problems. In Table No 1.VI various parameter considered for liquidity measurement in banks have been discussed.
Table No. 1.VI: Liquidity Ratios

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Definition / interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Liquid assets ratio</td>
<td>A rather crude yet useful measure of a bank's liquidity. It reflects the bank's ability to meet its short-term liabilities with its short-term assets. A bank that does not have to rely on the repayment of its loans in order to meet its obligations is “insulated” against its non-performing portfolio. This is calculated as (Short term assets: Cash due from banks, balances with banks abroad, Treasury Bills and Government securities, Interest receivable, bills of Exchange, balances with Reserve Bank of India)/(Short term liabilities: total deposits, liabilities to RBI, liabilities to other banks, Interest payable, Bills Payable and other liabilities).</td>
</tr>
<tr>
<td>2.</td>
<td>Total deposits to Total Assets</td>
<td>Measures the extent to which the bank’s assets are financed by the deposits of their customers. The greater the ratio the greater a bank’s vulnerability to liquidity problems in the event of a run on the bank and vice versa. This is calculated as (Core deposits: Demand, savings, and Time/ Total assets).</td>
</tr>
<tr>
<td>3.</td>
<td>Gross Loans to Total Deposits</td>
<td>Measures the extent to which a bank is able to mobilise deposits from the public to support its operations and the extent to which it is able to lend these deposits. A ratio of around 50% and above is considered adequate. This is calculated as (Loans before deducting allowance for loan loss/ total deposits).</td>
</tr>
<tr>
<td>4.</td>
<td>Funding Volatility Ratio (FVR)</td>
<td>FVR measures the extent to which banks rely on volatile liabilities to finance their assets. The smaller the ratio, the better the bank’s liquidity profiles. It is preferable to have FVR ( \leq 0 ) (indicates volatile liabilities are either exactly or more than fully covered by liquid assets. FVR is calculated as ([\text{VL-LA}/(\text{TA-LA})]). Volatile Liabilities (VL) savings and demand deposit. Liquid Assets (LA) = cash in hand and balances with central bank plus balances with banks and money at call and short notice plus investment in government and other approved securities. TA = on balance sheet total assets.</td>
</tr>
</tbody>
</table>

f. Systems and Control

In recent years, size of operation of banks has increased manifold. Besides, banks are entering into non-traditional activities in the financial services sector. Due to increased exposure of banks to various activities, the risks associated with them have also increased. Thus, the importance of managing operational risks that arises out of deficiencies in internal systems and controls, systems failures and non-adherence to prescribed procedures cannot be ignored. Operational risk covers a broad range of risks that are internal to the bank. There is increased focus on managing operation risk because of the scale of losses that banks have suffered as a result of breakdown in internal control. Banks have not been able to evolve any scientific method for quantifying operational risk. However, according to RBI’s guidelines on “Risk Management Systems in banks”, simple benchmark based on
business activity such as gross revenue, fee income, operating costs etc. could be used in the absence of any sophisticated models. Internal control is the primary means to mitigate operational risk. Thus, Systems and Control in banks could be quantified and analysed based on following broad categories of ratio such as:

(A) Vulnerability/Prudential Parameters  (B) Cost Parameters

If banks are not to be allowed to fail, it is essential to take corrective action in time. These ratios could be aligned with PCA framework to recognise the problems in advance or for continuously monitoring the troubled banks. These ratio could also be used as a “speed breaker” or “trip wires” to prevent or slow down deterioration of weak banks. The banks not complying with the PCA’s prudential framework may trigger supervisory / regulatory intervention. The “Trigger Ratio” should be considered sacrosanct. Banks must meet their trigger ratio at all times and a breach of this should be considered a serious violation, which has the effect of putting the banks’ customers at unacceptable risk. In order to avoid such a situation a “Target Ratio” is set which is normally 0.5 percent to 1 percent above the trigger ratio. This could act as regulatory buffer. The following ratios that has been mentioned in the Table No 1.VII can be used to design “Operational Risk Management” Model for the banks that would facilitate in evaluating level of System and Control in the banks under the study.
### Introduction

Table No.1.VII: System and Control

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Ratios</th>
<th>Definition/Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A: Vulnerability Prudential Ratios</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Capital Adequacy Ratio</td>
<td>CAR indicates banks’ ability to absorb shock and counter forthcoming risk. Regulatory authorities prescribe this ratio because they feel it is their duty to maintain strong and viable banking for the economy.</td>
</tr>
<tr>
<td>2.</td>
<td>Priority Sector Lending Ratio</td>
<td>Though banking is a profit making business, social obligations towards inclusive-growth cannot be ignored. Banking should facilitate in achieving equitable socio-economics objectives of the government for which banks in India were nationalised. In line with this objective, regulatory authority has defined priority sector scheme for agriculture, SSI, Cottage Industries etc. Minimum priority sector lending is 40% of total advances as per RBI’s guidelines.</td>
</tr>
<tr>
<td>3.</td>
<td>NPAs</td>
<td>The issue of NPA management is the biggest challenge before the banking sector. Tendency to accumulate poor quality assets affects competitive efficiency of banks. Quantum of NPA in relation to the total portfolio is an indicator of quality of assets and the forthcoming operational risk. A poor quality asset is due to poor administration i.e. substandard credit appraisal, follow-up and recovery of loan assets and weakness in credit risk management.</td>
</tr>
<tr>
<td>4.</td>
<td>Lending to sensitivity sector</td>
<td>The RBI also governs lending to sensitive sector i.e. capital market, real estate and commodity sector. There is a cap of 5% prescribed by RBI. Higher level of this ratio has negative impact on performance of banks, as this is an indicator of higher degree of risk exposure. It should not be more than 5% of lending.</td>
</tr>
<tr>
<td>5.</td>
<td>Contingent Liabilities Ratio</td>
<td>Contingent Liabilities arise due to off-balance sheet activities like forward contract, guarantees, letters of credit, acceptances and endorsements etc. The off-balance sheet items are in the nature of contingent liabilities. Proportion of contingent liabilities to total liabilities reflects the vulnerability to credit risk and liquidity risk. Higher the proportion of contingent liabilities to total liabilities higher would be the vulnerability and thus higher degree of operational risk.</td>
</tr>
<tr>
<td></td>
<td>B: Cost Function Ratios</td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Cost of Funds</td>
<td>The ratio is computed as interest paid on deposit and borrowing from RBI to total deposits and borrowing of the group. Low ratio is an indicator of managerial ability to arrange economical source of funds. Lower the ratio better would be the ranking of banks.</td>
</tr>
<tr>
<td>2.</td>
<td>Cost of Borrowing</td>
<td>The ratio is computed as interest paid on deposit to total deposits. Deposits being one of the major sources of funds for commercial banks, the ratio would indicate banks’ operational efficiency. Lower the borrowing better would be the performance of banks.</td>
</tr>
<tr>
<td>3.</td>
<td>Ratio of burden to interest income.</td>
<td>Burden is defined as total non-interest expenses minus total non-interest income divided by interest income. Lower the ratio lesser would be the pressure on the bottom line.</td>
</tr>
<tr>
<td>4.</td>
<td>Operating Expenses Ratios</td>
<td>Operating Expenses expressed as percentage of the Average Working Funds (AWF). The ratio is reflective of mangers’ ability in overall operational cost management.</td>
</tr>
<tr>
<td>5.</td>
<td>Cost of Deposit</td>
<td>Interest Paid on the deposit. Higher cost of deposit means excess pressure on margin thus higher PLR.</td>
</tr>
</tbody>
</table>
### Table No.1.VIII: Benchmarking for Capital Analysis

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Capital Adequacy Ratio (CAR) > 12%  
                  b. Tier I Capital > 6%  
                  c. Tier II Capital > 4.5%  
                  d. Tier II to Tier I Capital >=100%  
                  e. Net NPL to Net Worth < 5%  
                  f. Net Worth to Total Assets > 14%  
                  g. Debt to New Worth < 4 times |
| 2              | a. Capital Adequacy Ratio (CAR) < 12% but > 9%  
                  b. Tier I Capital < 6% but > 5%  
                  c. Tier II Capital < 4.5% but > 3.5%  
                  d. Tier II to Tier I Capital <100% > 80%  
                  e. Net NPL to Net Worth <10% but > 5%  
                  f. Net Worth to Total Assets < 14% but > 11%  
                  g. Debt to New Worth < 8 times but >4 times |
| 3              | a. Capital Adequacy Ratio (CAR) < 9% but > 6%  
                  b. Tier I Capital < 5% but > 4%  
                  c. Tier II Capital < 3.5% but > 2.5%  
                  d. Tier II to Tier I Capital <80% > 60%  
                  e. Net NPL to Net Worth <15% but > 10%  
                  f. Net Worth to total assets <11% but > 8%  
                  g. Debt to New Worth < 12 times but > 8 times |
| 4              | a. Capital Adequacy Ratio (CAR) < 6% but > 3%  
                  b. Tier I Capital < 4 % but > 3%  
                  c. Tier II Capital < 2.5% but >1.5%  
                  d. Tier II to Tier I Capital <60% > 40%  
                  e. Net NPL to Net Worth < 20% but >15%  
                  f. Net Worth to Total Assets < 8% but > 5%  
                  g. Debt to New Worth < 16 times but > 12 times |
| 5              | a. Capital Adequacy Ratio (CAR) < 3%  
                  b. Tier I Capital < 3%  
                  c. Tier II Capital < 1.5%  
                  d. Tier II to Tier I Capital <40%  
                  e. Net NPL to Net Worth > 20%  
                  f. Net Worth to Total Assets < 5%  
                  g. Debt to New Worth > 16 times |
### Table No. 1.IX: Benchmarking for Asset Quality Analysis

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Gross NPAs to Gross Advances < 5%  
b. Net NPAs to Net Advances < 1%  
c. NPAs to Total Assets < 2%  
d. Earning Assets to Total Assets > 90%  
e. Loss Loan Cover Ratio > 100% |
| 2              | a. Gross NPAs to Gross Advances > 5% but < 10%  
b. Net NPAs to Net Advances > 1% but < 4%  
c. NPAs to Total Assets > 2% but < 4%  
d. Earning Assets to Total Assets < 90% but > 85%  
e. Loss Loan Cover Ratio < 100% but > 80% |
| 3              | a. Gross NPAs to Gross Advances > 10% but < 15%  
b. Net NPAs to Net Advances > 4% but < 7%  
c. NPAs to Total Assets > 4% but < 6%  
d. Earning Assets to Total Assets < 85% but > 80%  
e. Loss Loan Cover Ratio < 80% but > 60% |
| 4              | a. Gross NPAs to Gross Advances > 15% but < 20%  
b. Net NPAs to Net Advances > 7% but < 10%  
c. NPAs to Total Assets > 6% but < 8%  
d. Earning Assets to Total Assets < 80% but > 75%  
e. Loss Loan Cover Ratio < 60% but > 40% |
| 5              | a. Gross NPAs to Gross Advances > 20%  
b. Net NPAs to Net Advances > 10%  
c. NPAs to Total Assets > 8%  
d. Earning Assets to Total Assets < 75%  
e. Loss Loan Cover Ratio < 40%. |
### Table No.1.X: Benchmarking for Management Analysis

#### A. Productivity Ratios

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Business Per Branch $>$ Rs. 50 crores.  
                b. Business Per Employees $>$ Rs. 4 crores.  
                c. Operating Profit Per Branch $>$ Rs. 1 Crores.  
                d. Operating Profit Per Employees $>$ Rs. 0.11 Crores. |
| 2              | a. Business Per Branch $<$ Rs. 50 crore but $>$ 40 crores  
                b. Business Per Employees $<$ Rs. 4 crore but $>$ Rs. 3 crores  
                c. Operating Profit Per Branch $<$ Rs. 1 crore but $>$ 0.75 crore  
                d. Operating Profit Per Employees $<$ Rs.0.11 crore but $>$ Rs 0.08 crore |
| 3              | a. Business Per Branch $<$ Rs. 40 crore but $>$ 30 crores  
                b. Business Per employees $<$ Rs. 3 crore but $>$ Rs. 2 crores  
                c. Operating profit Per Branch $<$ Rs. 0.75 crore but $>$ Rs.0.50 crore  
                d. Operating Profit Per Employees $<$ Rs. 0.08 crore but $>$ Rs.0.05 crore |
| 4              | a. Business Per Branch $<$ Rs. 30 crore but $>$ Rs. 20 crores  
                b. Business Per Employees $<$ Rs. 2 crore but $>$ Rs. 1 crore  
                c. Operating Profit Per Branch $<$ Rs. 0.50 crore but $>$ Rs.0.25 crore  
                d. Operating Profit Per Employees $<$ Rs. 0.05 crore but $>$ Rs.0.03 crore |
| 5              | a. Business Per Branch $<$ Rs. 20 crores.  
                b. Business Per Employees $<$ Rs. 1 crore  
                c. Operating Profit Per Branch $<$ Rs. 0.25 crore  
                d. Operating Profit Per Employees $<$ Rs. 0.03 crore |

#### B. Operational Efficiency

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Non Interest Income to NWF $>$ 2.5%  
                b. Interest Income to AWF $>$ 10%  
                c. Cost Income Ratio (CIR) $>$ 0.25% |
| 2              | a. Non Interest Income to NWF $<$ 2.5% but $>$ 2%  
                b. Interest Income to AWF $<$ 10% but $>$ 8%  
                c. Cost Income Ratio (CIR) $>$ 0.25% $<$ 0.50% |
| 3              | a. Non Interest Income to NWF $<$ 2 but $>$ 1.5%  
                b. Interest Income to AWF $<$ 8% but $>$ 6 %  
                c. Cost Income Ratio (CIR) $>$ 0.50% $<$ 0.75% |
| 4              | a. Non Interest Income to NWF $<$ 1.5% but $>$ 1%  
                b. Interest Income to AWF $<$ 6% but $>$ 4%  
                c. Cost Income Ratio (CIR) $>$ 0.75% $<$ 1% |
| 5              | a. Non Interest Income to NWF $<$ 1%.  
                b. Interest Income to AWF $<$ 4%  
                c. Cost Income Ratio (CIR) $>$ 1% |
Table No. 1.XI: Benchmarking for Earnings Analysis

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. ROA > 1.5%  
b. ROE > 35%  
c. Spread to Total Interest > 50%  
d. NIM to Total Assets > 3.5%  
e. LRY > 30%  
f. Interest Income to Total Assets > 10%  
g. Non Interest Income to Total Assets > 2.5%  
h. Burden to Total Interest Income < 1% |
| 2              | a. ROA < 1.5% but > 1%  
b. ROE < 35% but > 25%  
c. Spread to Total Interest < 50% but > 40%  
d. NIM to Total Assets < 3.5% but > 3%  
e. LRY < 30% but > 25%  
f. Interest Income to Total Assets < 10% but > 8%  
g. Non Interest Income to Total Assets < 2.5% but > 2%  
h. Burden to Total Interest Income > 1% but < 5% |
| 3              | a. ROA < 1% to but > 0.5%  
b. ROE < 25% but > 15%  
c. Spread to Total Interest < 40 % but > 30%  
d. NIM to Total Assets < 3% but > 2.5%  
e. LRY < 25% but > 20%  
f. Interest Income to Total Assets < 8% but > 6%  
g. Non Interest Income to Total Assets < 2% but > 1.5%  
h. Burden to Total Interest Income > 5% but < 10% |
| 4              | a. ROA < 0.50 % to but > 0.25%  
b. ROE < 15% but > 5%  
c. Spread to Total Interest < 30 % but > 20%  
d. NIM to Total Assets < 2.5% but > 2%  
e. LRY < 20% but > 15%  
f. Interest Income to Total Assets < 6% but > 4%  
g. Non Interest Income to Total Assets < 1.5% but > 1%  
h. Burden to Total Interest Income > 10% but < 15% |
| 5              | a. ROA < 0.25%  
b. ROE < 5%  
c. Spread to Total Interest < 20%  
d. NIM to Total Assets < 2%  
e. LRY < 15%  
f. Interest Income to Total Assets < 4%  
g. Non Interest Income to Total Assets < 1%  
h. Burden to Total Interest Income > 15% |
Table No. 1.XII: Benchmarking for Liquidity Analysis

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Liquid Assets Ratio > 60%  
b. Total Deposit to Total Assets < 70%  
c. Gross Loan to Total Deposit < 50%  
d. FVR < -0.71 % |
| 2              | a. Liquid Assets Ratio < 60% but > 50%  
b. Total Deposit to Total Assets > 70% but < 80%  
c. Gross Loan to Total Deposit > 50% but < 55%  
d. FVR > -0.71 % but < -0.41 % |
| 3              | a. Liquid Assets Ratio < 50% but > 40%  
b. Total Deposit to Total Assets > 80% but < 70%  
c. Gross Loan to Total Deposit > 55% but < 60%  
d. FVR > -0.41 % but < -0.11 % |
| 4              | a. Liquid Assets Ratio < 40% but > 30%  
b. Total Deposit to Total Assets > 90% but < 100%  
c. Gross Loan to Total Deposit > 60% but < 65%  
d. FVR > -0.11 % but < +0.19 % |
| 5              | a. Liquid Assets Ratio < 30%  
b. Total Deposit to Total Assets >100%  
c. Gross Loan to Total Deposit but >65%  
d. FVR > +0.19 % |

Table No. 1.XIII: System and Control Analysis

A. Vulnerability/ Prudential Ratio

<table>
<thead>
<tr>
<th>Assigned Score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Capital Adequacy Ratio (CAR) > 12%  
b. Priority Sector Lending Ratio > 40%  
c. Net NPA Ratio < 0.01%  
d. Lending to Sensitivity Sector <2%  
e. Contingent Liabilities < 4% |
| 2              | a. Capital Adequacy Ratio (CAR) < 12% but > 9%  
b. Priority Sector Lending Ratio < 40% but > 35%  
c. Net NPA Ratio> 0.01 % but < 0.12%  
d. Lending to Sensitivity Sector <4% but >2%  
e. Contingent Liabilities >4% < 6% |
| 3              | a. Capital Adequacy Ratio (CAR) < 9% but > 6%  
b. Priority Sector Lending Ratio < 35% but > 30%  
c. Net NPA Ratio> 0.12% but < 0.50%.  
d. Lending to Sensitivity Sector < 6% but > 4%  
e. Contingent Liabilities > 6% < 8% |
| 4              | a. Capital Adequacy Ratio (CAR) < 6% but >3%  
b. Priority Sector Lending Ratio <30% but > 25%  
c. Net NPA Ratio>0.50% but < 1%  
d. Lending to Sensitivity Sector < 8% but > 6%  
e. Contingent Liabilities > 8% < 10% |
| 5              | a. Capital Adequacy Ratio (CAR) < 3%  
b. Priority Sector Lending Ratio < 25%  
c. Net NPA Ratio> 1%  
d. Lending to Sensitivity Sector > 8%  
e. Contingent Liabilities > 10% |
### B. Cost Function Ratio

<table>
<thead>
<tr>
<th>Assigned score</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1              | a. Cost of Funds < 4%.  
                b. Cost of Borrowings < 2%.  
                c. Ratio of burden to interest income < 4%.  
                d. Ratio of Intermediation cost < 2%.  
                e. Cost of Deposit < 4%. |
| 2              | a. Cost of Funds < 5% but > 4%  
                b. Cost of Borrowings < 4% but > 2%  
                c. Ratio of burden to interest income < 8% but > 4%  
                d. Ratio of Intermediation cost < 2.5% but > 2%  
                e. Cost of Deposit < 5% but > 4% |
| 3              | a. Cost of Funds < 6% but > 5%  
                b. Cost of Borrowings < 6% but > 4%  
                c. Ratio of burden to interest income < 12% but > 8%  
                d. Ratio of Intermediation cost < 3% but > 2.5%  
                e. Cost of Deposit < 6% but > 5% |
| 4              | a. Cost of Funds < 7% but > 6%  
                b. Cost of Borrowings < 8% but > 6%  
                c. Ratio of burden to interest income < 16% but > 12%  
                d. Ratio of Intermediation cost < 3.5% but > 3%  
                e. Cost of Deposit < 7% but > 6% |
| 5              | a. Cost of Funds > 7%.  
                b. Cost of Borrowings > 8%  
                c. Ratio of burden to interest income > 16%  
                d. Ratio of Intermediation cost > 3.5%  
                e. Cost of Deposit > 7%. |

### X. Limitations of the study

Limitations and constraints are inevitable in every research work. So is the case with present study. Some of its limitations are as under.

The relevant data and information for the study have been collected from the secondary sources. Hence, the study carries all the limitations inherent in the secondary data and information. I came across many problems in collecting the data. After data collection compilation and arranging the data in a user friendly way and punching in the spreadsheet was really challenging and tedious. During the course of the compilation some approximations and estimates were also made. Though the non-financial management (qualitative) aspect of banks’ performance has its own importance, it has been ignored in the present study. Only the financial (quantitative) data have been taken into consideration for analytical purposes.

Statistical devices used for the analysis have their own limitations. So, the findings of the present study should be rationally and carefully utilised keeping in view of such limitations.
At the outset, it needs to be mentioned that the purpose of this study has been to conduct the performance appraisal of nationalised banks using CAMELS Model's based ratio and not to provide universal ratings. Supervisory rating conducted by supervisor using the model may vary from this research, as most of the data used by the supervisors for evaluation is kept secret. The findings in this study are based on author's own calculations. However, the results need to be interpreted with caution.

**XI: Outline of the Study**

This research work is divided into seven chapters and all relevant knowledge that are essential to understand the research concepts are incorporated in the study. The first chapter deals with the "Introduction", which covers significance of the study, review of literature on the subject, a brief summary of the CAMELS Model and research methodology.

The second chapter, which is, entitled as "Banking Sector in India: An Overview" deals with genesis and structure of banking in India. Vivid discussions on evolution of modern banking in India in the pre-independence period, pre-liberalisation period and post liberalisation period have been made.

In the third chapter, "CAMELS Model and its Implementations in Banks", a detailed discussion on the model has been covered along with the significance of the various parameters incorporated in the model for conducting performance evaluation of NCBs. A detailed discussion on the parameters of the model viz. Capital, Assets Quality, Management, Earnings, Liquidity and Systems and Control along with various ratios has also been covered in research methodology section of Chapter 1.

The fourth chapter is entitled as "BASEL Norms and Status of Supervisory Environment in India" covers a brief review on BASEL I and II in general and India's perspective. Supervisory structure in India and PCA Norms has also been mentioned in this chapter.

The fifth chapter on "Financial Sector Reforms in India and Their Impact on Banks" covers a discussion on scenario that led to reforms in India, areas of
banking sector reforms & their impact and trend and finally progress of banking sector in the post reforms period.

The sixth chapter on “Analysis and Interpretation” discusses in the detail the performance evaluation of NCBs for the period of study. Finally, the seventh chapter of the work gives “conclusion and suggestions”. I hope the suggestions recommended in the study will help in identifying potentially weak banks and avoid probability of a bank failure.
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Introduction


Chapter 1


Introduction


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