CHAPTER I

INTRODUCTION
INTRODUCTION

1.1 Before large commercial banks were nationalized they played the role of financial intermediaries with deposit collection and lending were their main activities. Bank credit reached urban people, industry, trade and commerce. The need for credit of rural people and small scale industries was mostly ignored. Profit making was the chief objective. Largest commercial banks 14 in number were nationalized in the year 1969. Social objectives such as welfare of the people, uniform distribution of credit to all sections of the society were added to the already existed list of objectives. Six more banks were nationalized in the year 1980. During 1969-1990 public and private sector banks co-existed under highly regulated environment. Their freedom was intervened by the government through its fiscal policies and Reserve Bank of India (RBI) through its monetary policies. Rates of interest were controlled, rule of licensing was imposed, huge sums of money were channeled as credit to government at less than market rate of interest. Banks were directed to advance credit to the priority sectors favored by the government at less than market rate of interest.

In 1991 Indian commercial banks were found to face financial repression. The policies, laws, regulations and informal controls which prevent the proper functioning of the banking sector lead to financial repression for which government intervention is mainly responsible. The government can interfere in a number of ways to cause financial repression by pursuing intervention policies involving statutory preemptions, interest regulation and directing credit to the priority sectors. (Joshi and Little, 1997).

In India in 1992, 40% of the total credit had to go to priority sectors such as agriculture, small scale industries, small transport operators or the export sector. These funds were channeled at regulated interest rates which fell below the market rates of interests. During the 1960s and 1970s the Cash Reserve Ratio (CRR) was about 5% and in 1991 it reached to a level of 15%. 3% and 15% were legal minimal and maximum levels of CRR respectively. In Feb. 1992 Statutory Liquidity Ratio (SLR) was 38.5%, while the upper limit existed at 40%. The Indian commercial banks were left with 14.5% of bank credit at their disposal to perform their own business (Roland, 2006). For countries which suffer from financial repression the policy
recommendations are that the real interest rates shall be allowed market determined. Reduction of CRR and SLR to the levels that leave enough funds with the banks to perform not only their banking activities but to move towards stable financial system. Another anti-repression policy is to reduce directed credit to the priority sector (Wachtel, 2001). Nevertheless all forms of the government intervention do not constitute repression policies. If market failures occur the intervention of the government may strengthen the position of banks in financial marketing (Roland, 2006).

1.2 NON-PERFORMING ASSETS:

Prior to the implementation of first stage reforms in 1991 the Indian commercial banks in particular the public sector banks suffered from the presence of Non-Performing assets (NPA). NPA means an asset or account of borrower, which is classified by a bank as substandard, doubtful or loss asset according to the norms suggested by the country’s Central Bank. NPA does not yield any income to the lender bank in the form of principal and interest payments. NPAs reflect the health of a commercial bank and the presence of credit defaults.

NPA requires provisions which reduce the overall profits and shareholders value. RBI imposed provision norms against asset classification. It ranges from 0.25% to 100% from standard to loss assets respectively (Joshi and Joshi, 2002). Risk is inherent in the bank business. The risk faced by a bank is a combination of environmental and volitional risks. The former is viewed to occur due to exogenous factors such as changes in macro-economic variables. The later risk arises due to endogenous factors inherent in the decision made by a bank (Joshi and Joshi, 2002). It is hypothesized that NPAs serve as a proxy for the ill effects of risk caused by exogenous and endogenous non-discretionary factors.

A raise in NPA and their provisions leads to shortage of lonable funds, insufficient funds for investments, and fall in the value of equity share and failure to attract deposits. The monitory constraints additionally imposed by NPAs fail to usher new technology and to use human resource to their potential. Thus, NPAs and the associated provisions lead to deterioration of the productivity of inputs such as labor.
and fixed capital. Thus, an increase in NPA deteriorates input technical efficiency. A fall in input technical efficiency implies greater input losses.

There were time series studies to examine the impact of deregulation on Indian Commercial Banks. Certain studies supported that deregulation resulted in increase in efficiency and productivity (Bhattacharya et al., 1997; Ram Mohan and Ray, 2004; Shanmugam and Das, 2004; Chatterjee 2006; Jaffry 2007; Kumar and Gulati, 2009). Some studies concluded that liberalization and deregulation resulted in either insignificant impact or a decline in productivity, and efficiency (Kumbhakar and Sarkar, 2003; Sensarma 2005; Galagedera and Edirisuriya, 2005; Das and Ghosh, 2006). But most of the studies did not include NPAs explicitly in their attempt to evaluate productivity and efficiency.

1.3 Risk Related External and Internal Non-Discretionary Factors in Commercial Banks of India:

Due to better functioning of the commercial banks the Govt., and RBI intervened and introduced anti-repression policies following Narasimham committee report in 1991. Even in intervention of the reforms the commercial banks still faced exogenous risk due to external non-discretionary factors. For example, entry deregulation ushered more competition due to the entry of new private and foreign sector banks. During the financial year 1992-93 the market share in deposits, investments, advances and total assets of public sector banks were 87.9, 85.9, 89.3 and 87.2 respectively. Owing to the entry of more private and foreign sector banks the market shares in deposits, investments, advances and total assets of public sector banks have reduced to 74.9, 73.1, 72.9 and 72.3 percent respectively, (Kumar and Gulati, 2009). Before dismantling the rules of licensing the central bank directed commercial banks that if a commercial bank opened a branch where already one or more of its branches existed, then it should open four branches where its branches did not exist. Branch licensing was introduced in the year 1977 and withdrawn in 1990 (Kumar and Gulati, 2009). Consequent to this wherever considerable business existed to capture more of it, driven by competition different commercial banks opened their branches. Thus, de-licensing invited more competition.
Increased competition induces banks to face risky environment in financial market. For survival and to increase share in deposits, loans and advances and investments innovative financial products are introduced by the commercial banks. In the event that these banks fail in promoting the financial products and wherever promoted if they fail to get returns as much the management anticipated non-performing assets would tend to increase. Deregulation of interest leads to interest rate determined more by market forces such as demand for and supply of funds. However, the prime lending rate is determined by the RBI. The interest risk leads to non-performing assets. In India, a 2 percent rise in lending rates can cause a 4 percent increase in the share of NPA. Rate of interest and the consequent NPAs are determined both by external and internal non-discretionary factors. Prior to deregulation of interest rates, these rates were setup by the Central Bank and most of the rate risk was due to external non-discretionary factors. CRR and SLR are statutory preemptions whose changes are exogenous to a commercial bank. Both CRR and SLR reached all time high and down trend was noticed in supply of credit by Indian commercial banks prior to first stage reforms were implemented. If demand for credit is the same but supply of credit is less due to high statutory preemptions the supply curve shifts downwards and the market determined rate of interest is found to increase. Since variations in CRR and SLR influence market determined rate of interest, they also induce exogenous risk which contributes to NPAs. During financial repression priority sector lending was 40 percent in total credit distribution. Most of these loans were target oriented, given against inadequate collateral securities leading to credit risk. It is generally accepted that the priority sector lending produced more NPAs than non-priority sector. This was observed in a study of NPAs of 33 banks by the RBI. But, in recent years the relative contribution of non-priority sector to NPAs of banks has been found increasing (Mukherjee, 2000).

While the first stage reforms were in progress the second stage reforms were introduced in the year 1998 by the policy makers. These reforms were based on Narasimham Committee Report (II). The objectives of these reforms were to increase the capital adequacy ratio from its minimal level, recognition of market risks and their
effective management. The reforms also required introduction of Asset Liability management system, transparency and disclosure practices.

The Reserve Bank of India issued guidelines for management of credit, market and operational risks. A risk management system should continuously measure, monitor and control all risks, such as credit, market and operational risks. Credit risk mostly refer to loans and advances. The amount at risk in future due to default is not known exactly, but if the underlying probability distribution is known from past experience the mean value of amounts under default may be estimated.

The commercial banks nowadays heavily focused their attention on identification and effective control of credit, market, interest and operational risks. Uncertainties in future earnings owing to the changes in market conditions induce market risk. Market conditions are exogenous to a commercial bank’s performance, and if these conditions are unfavorable the market risk induces NPAs.

A bank may function ignoring all the issues concerned with risk even if they are endogenous. Such negligence results in asset value deterioration leading to greater NPAs. Whenever losses are envisaged the bank management reacts to these losses and takes necessary steps for damage control. Interactive risk management to deal with face to face interaction with such risk that cannot be predicted in advance should be a component of the overall risk control mechanism that a commercial bank institutes. As a part of relative risk management, in 2002 securitization and reconstruction of financial assets and enforcement of Security Interest Ordinance Act was introduced. The act enabled to attach and sell pledged assets in case of default and helped to improve their NPA situation in recent years.

A commercial bank may be proactive in its risk management so that future risks are forecasted and possible damages can be avoided though not fully but atleast partially. A stronger internal risk control system can prevent NPAs from occurring. Thus, NPAs occur not only due to exogenous and endogenous non-discretionary risk factors.
1.4 MODELING COMMERCIAL BANKS – CHOICE OF TECHNOLOGY:

Performance of banks and bank branches were studied by a number of analysts, but unfortunately there is no general consensus not only in choice of technology but also inputs and outputs (Humphrey 1985; Berg, et.al., 1991; Parsons et.al, 1993; Tulkens, 1993; Humphrey, 1993; Berg et.al., 1993; English et.al., 1993; Chaffai, 1997; Brockett et.al., 1997; DeYoung. R., 1997; Mester Loreta 1997; Kumbakar et.al., 1998; Mlima & Hjalmersson 2000; Casu and Giradone 2002; Sathye 2003).

The commercial banks can be modeled in either production or intermediation perspective. The production approach (Benston, 1965) views a commercial bank as a financial institution that combines its inputs to produce services to the customers. Bank’s output in this case is number of transactions which is a flow variable. In the absence of information on the above variable deposits and loan amounts are chosen as outputs. The collection of deposits consumes bank’s resources as such it is viewed as an output variable. In production approach stock variables such as labor and fixed assets are chosen as inputs. ‘The production approach focuses only on operating cost, but completely ignores interest expense (Kumar and Gulati, 2009)’.

Under the intermediation approach financial institutions are viewed to intermediate funds between depositors and borrowers (Sealey and Lindley, 1977; Piyu, 1992). This approach views that banks produce intermediation services using deposits and other liabilities such as loans, securities, and other investments as inputs (Kumar and Gulati, 2009). While the production approach views deposits as output, the intermediation approach treats the same as input.

In this study we have followed production approach to model a commercial bank. The inputs that it employs are number of employees and fixed assets outputs that it produces are Loans and Advances, Investments and Non-interest income.

In production approach ‘number of transactions’ is the appropriate variable to measure output. However, if information is unavailable on this variable a close match is number of accounts. As we deal with secondary data (Bulletins of RBI) information on neither of the variables is available. The present study recognizes that the employees armed with technology contribute to the non-interest income that serves as
a DEA output. In addition to deposits and Loans and advances, investment and non-interest income are included in DEA outputs. In Indian context Sensarma (2005) used investment as an output.

1.5 OBJECTIVES:

All the commercial banks operating on Indian soil can be segregated into Public, Private and Foreign sector banks. The three sectors of banks function under different environments exogenous and endogenous. Credit risk experienced by a commercial bank is believed to occur due to exogenous and endogenous discretionary and non-discretionary factors.

The objectives of the present study are:

1. To examine if Exogenous Credit Risk environment is the same for Public, Private and Foreign sector banks.
2. To examine if Endogenous Credit Risk environment is the same for Public, Private and Foreign sector banks.
3. Multiplicative decomposition of overall productive efficiency into its sources.
4. Theoretical Methodology to assess the Credit Risk Management Efficiency and its decomposition.

1.6 CREDIT RISK:

Risk in commercial banks exists due to uncertainty which leads losses to occur. Credit Risk, Interest Risk, Liquidity Risk, Insolvency Risk, Operational Risk and Market Risk are risks that a commercial bank experiences. Of all these risks the most important one is the credit risk. The ill effects of credit risk occurs due to a number of internal and external discretionary and non-discretionary factors. The exogenous non-discretionary factors are government’s intervention through the fiscal policies, the central bank’s intervention through its monitory policies, external competition from the financial institutions, economic recession, and insufficient volume of funds in money market, are some important sources which contribute to
exogenous credit risk. All factors which lead to poor credit risk management constitute endogenous credit risk.

In this study non-performing assets (NPAs) are chosen to proxy loan losses or provisions for loan losses.

1.7 DATA ENVELOPMENT ANALYSIS (DEA) - VARIABLE SELECTION:

The first step in Data Envelopment Analysis is variable selection. In Indian context there are several studies of commercial banks performance. The studies consisted of assessing technical efficiency, scale efficiency, cost efficiency, Revenue efficiency and so on. The input and output variables are, Deposits, Staff, Spread, Commission, Exchange and Brokerage, Capital, Loanable funds, Interest Income, Space, Number of transactions, Customer response, Number of Branches, Number of Accounts, Floor space, Computer Terminals, Rent, Number of ATMs, Interest income, Non-interest income, Investments. Some of these variables were chosen as DEA inputs the other as DEA outputs. But, hardly any attempts are found to measure credit risk efficiency.

This study assumes Non-Performing Assets (NPAs) is a proxy to represent Credit Risk. Larger NPAs per unit of loans and advances is chosen as environmental variable which is determined by exogenous, endogenous discretionary and non-discretionary factors.

The data of this study are drawn from Reserve Bank of India Bulletins covering the financial year 2008-09. Therefore, the data are secondary and out of the variables available DEA inputs and outputs are selected by a ‘Stepwise Method’.

1.8 NEW DEA METHODOLOGY:

The study proposes new DEA models to measure Exogenous Risk, Endogenous Risk and Endogenous Risk Management efficiency. The quantitative measurement of efficiency in the presence of multiple inputs and multiple outputs scenario was due to Charnes, Cooper and Rhodes (CCR, 1978). They introduced an envelopment problem that measures overall input (output) technical efficiency. The CCR (1978) problem was extended by Banker, Charnes and Cooper (BCC, 1984)
which identifies input (output) scale differences. Both the studies assume that inputs and outputs are discretionary. While modeling an institution in terms of Data Envelopment Analysis (DEA) models, many situations include qualitative variables and also non-discretionary continuous variables.

In the case of continuous non-discretionary variables, Banker and Morey (BM, 1986) modeled a non-discretionary input variable 'z' as follows:

$$\sum_{p}^{n} \lambda_{p} z_{j} \leq z_{0}$$

This variable 'z' is exogenously determined. If this is endogenously determined its constraint may be expressed as,

$$\sum_{p}^{n} \lambda_{p} z_{j} \leq \sum_{p}^{n} \lambda_{p} z_{0}$$

Golany and Role (GR, 1993) introduced a DEA model that takes into account simultaneously exogenous and endogenous inputs and outputs.


T. Subramanyam and C.S. Reddy (2008) constructed DEA methodology to measure risk of commercial banks. Sixty three commercial banks comprising public, private and foreign sectors exposed to common production frontier are considered for credit risk efficiency measurement. Inputs of the study are, Number of Employees and Fixed Assets. Desirable outputs are (1) Deposits, (2) Loans and Advances, (3) Investments and undesirable output is Non-Performing Assets. Their study decomposes multiplicatively input technical efficiency measured in risk free scale efficient environment into risk, scale and pure technical efficiency. The study infers that the in built risk control system is equally strong for public and foreign sector banks. Irrational loan advances, investments are prominent more in private sector than public sector banks. The foreign sector banks are found well ahead in their performance in all respects than public and private sector banks.
The proposed study is an extension of the work done by Mr.T.Subramanyam and Prof. C.S.Reddy (2008). Instead of input orientation we have chosen output orientation. The approach computes efficiency measures:

\( \theta (CCR) \): Output overall technical efficiency

\( \theta (BCC) \): Output efficiency from which output scale differences are delineated

\( \theta (BCC, JR) \): The efficiency measure purged of the influence of exogenous non-discretionary factors.

\( \theta (BCC, JR, BM, WD) \): The efficiency measure from which the influence of endogenous non-discretionary factors is eliminated under the assumption that the ill effects of credit risk are measured by non-performing assets that are not disposed off costlessly. This assumption refers weak disposability of undesirable output (NPA).

The overall output technical efficiency measure is decomposed into the product of output scale, exogenous credit risk, endogenous credit risk and pure technical efficiency.

The empirical results are interesting showing new directions to commercial banks.

1.9 CHAPTER SCHEME

This thesis is divided into five chapters:

- **Chapter -I**: Introduction
- **Chapter -II**: Review of Literature
- **Chapter -III**: Theory and Methodology
- **Chapter -IV**: Empirical Investigation
- **Chapter -V**: Summary and Conclusions