RESEARCH METHODOLOGY

Commercial banks are supposed to play a crucial role in achieving the economic growth and development. They are required to provide effective institutional credit to the various sectors of the economy to give spiral effect to income and employment activities.

3.1 Need of the Study

Prior to nationalization, the commercial banks in India were privately owned and functioning on the basic principle of profit maximization. The branches of commercial banks were confined more or less to urban areas and more than 80 percent of branches were concentrating in urban areas and credit was largely available to traders, commerce and industry. But after nationalization the basic objective of profit maximization has been completely changed.

The focus has been shifted from profit maximization to social banking. This has caused falling profit of commercial banks. The newly introduced norms in the form of certain statutory obligations eroded their profitability considerably. Narasimham, M. (1994) the substantial percentage of banks resources being locked up in the form of statutory obligations, their income earned in the form of interest has remained very low.

Further the poor recovery of loans particularly of agricultural loans and locking up of their funds in sick small-scale industries, the profitability continued to remain low. Other than this target oriented branch expansion policy of serving the unbanked areas has also been responsible for coming up of non-viable branches and consequently poor profits.

According to branch licensing policy 1969-70 the banks were given licenses for opening one office in urban areas for every three offices opened in rural and semi-urban areas. This has also caused low profitability. But with the introduction of banking sector reforms in 1991 branch licensing policy was abolished and banks were made free to open or close branches except the rural branches. Patel. K.V. and D.P. Khankkhoje (1991) the financial sector reforms committee made it clear that the
progress made in rural branch expansion should not be reversed and closure of rural branch shall require prior approval.

The government policy since nationalization has also been to extend and expand credit not only to those sectors which were of utmost importance in terms of their contribution to national income and employment but also to those sectors which were neglected. The sectors identified for easy access to credit were agriculture, Small-Scale Industry (SSI) and self employment. These sectors were accorded priority status for credit allocation. In the recent years, the government policy of credit access has also focused on credit to consumer durables, credit to corporate elite and credit to capital market-related activities. Since priority sectors are critical to high and sustained growth of GDP. The business of the banks had been to focus priority sectors irrespective of whether there are credit targets or not. This has also called the attention to assess the changes those have taken place in the form of flow of credit to priority sectors.

In the banking space, liberalization has also resulted in to the entry of new private sector banks in the last one and half decade. Presently, the RBI has for the first time brought the norms regarding the entry of new banks or issuing of licenses to the corporate houses or industrialists. This is expected to affect the profitability of public sector banks. It is apprehended that accounts of many corporate houses are likely to be transferred from public sector banks to their own private sector banks. It has also been debated that the chances are there to have more and more flow of credit to the associated company from their own bank.

One another impact of the banking sector reforms that has caught the attention is the substantial expansion of foreign banks in the country. In the year 1987 there were 42 foreign banks operating in India with a branch network of 132, which has risen to 138 branches in the year 1990-91 and has touched 306 branches network at the end March 31, 2010. Concerning total assets, during the year 1987 total assets of foreign banks were ₹ 7247 crore which went up to ₹ 18929 crore at the end March 31, 1991 and to ₹ 433494 crore at the end March 31, 2010. Batcha, Ameer (2002) it is committed under W.T.O.(World Trade Organization) agreement that minimum 12 licenses every year have to be issued to foreign banks or their branches.
These banks are spreading their branches to suburbs of metros and to the commercially significant areas. Such policies are likely to have long term implications on the Indian banking. The entry of foreign banks and more and more domestic private sector banks are expected to erode the profits of public sector banks.

**S. Santhanakrishan (2005)** in India, the globalization process took off after 1991 in the shape of banking sector reforms, which can rightly be called a watershed event in our march towards globalization.

**Bhide, et al. (2001)** globalization is both a challenge and an opportunity for Indian banks to gain strength in the domestic market and increase their presence in the global market.

The Narasimham Committee has attributed the poor performance of Commercial Banks in the post-liberalization period not to public ownership but points mainly to the managerial and policy environment within which banks had operated. The Committee report has sought to improve the efficiency of the banking system by introducing transparency in operations and ensuring that banking sector should operate on a sound financial footing. On this basis, controls on interest rates were removed, regulatory and supervisory standards strengthened. New norms of assets classification, income recognition and capital adequacy requirements were introduced. In a further step saving interest rates have been deregulated.

With the growing competition due to liberalization and globalization customer centric approach has become the order of the day in the banking industry. Therefore, the operational efficiency has become the primary goal of all banking organizations. In a reasonable duration of time, there has been a meaningful evaluation of commercial banks, how they have performed in terms services provided to customers in the changed policy environment.

On this front many questions have been embarked. Has the performance of commercial banks in India improved since the financial deregulation? The question is relevant due to certain reasons. Firstly the entry and expansion of private sector banks including foreign banks. It was expected that Indian Banks would re-organize their operations to improve their efficiency to meet the increased competition. The efficiency of commercial banks to a larger extent is going to affect the stability of the
financial system, therefore it is essential to know that how on the back of financial sector reforms, the performance of commercial banks have been affected.

The number of studies using econometric techniques for evaluating the performance of commercial banks in the reform period has been made. But still certain aspects have been remained untouched. In most of the studies analysis has been based upon limited number of banking parameters, limited time period and lack of operational aspect. These studies have hardly analyzed the impact of the entry of new private sector banks on the public, old private and foreign banks. Therefore, it is required that one such study analyzing the efficiency of the banks on economic and non-economic parameters should be carried out. All the divergent dimensions of the performance of the banks have been taken up for evaluating their performance. In the past no such comprehensive study has been made looking the trends in the banking industry, computing return to scales, applying linear and cobb-douglas production function, tracing multicollinearity, assessing the impact of financial sector reforms using dummy variable and assessing the quality of services.

The performance of bank-groups taken together may not represent the factual position of each bank included in the group. Because some banks on account of their strong financial policies may have performed better. Therefore performances of individual banks have also been analyzed. The bank-groups-wise absolute and relative performance has also been analyzed taking various indicators. The time span for the study has also been kept very long almost all years have been taken for which data information was available in order to find the inter-bank disparities in the performance of a particular indicator. The disparities could be assessed in a better way by keeping the span of study long. Therefore not even a single study seems to cover a sufficiently large span of time so that an objective picture of the bank’s performance could emerge and covering the aspect of operational efficiency. Thus, keeping in view the above mentioned limitations it is important that a comprehensive study evaluating and comparing the performance of different bank groups and quality of services provided by selected banks for the study should have been taken up.

3.2 Scope of the Study

The present study aims at analyzing the performance and quality of services of commercial banks in the helm of banking sector reforms. In order to study the actual
impact of banking sector reforms, the performance has been compared in the pre-
reform and post-reform period.

Since Scheduled Commercial Banks (SCBS) represent majority of commercial
banking activity in India. Therefore, the study has been confined to the scheduled
commercial banks only. The Scheduled Commercial Banks are those, which are
included in the second schedule of RBI Act, 1934. However, the Regional Rural
Banks have been excluded in the present study.

The study includes all the twenty-six public sector banks working in India. Out of
these, seven belong to State Bank of India group, and nineteen belong to nationalized
bank group. The State Bank of India and its associate group include: State Bank of
India (SBI), State Bank of Bikaner and Jaipur (SBB&J), State Bank of Hyderabad
(SBOH), State Bank of Indore (SBOI), State Bank of Mysore (SBOM), State Bank of
Patiala (SBOP), and State Bank of Travancore (SBOT). Out of 27 public sector banks
working in India in the year 1980, only 26 banks have been incorporated in the study
leaving State Bank of Saurashtra (SBOS) which merged with State Bank of India in
the year 2008.

The groups of nationalized banks include Allahabad Bank (AB), Andhra Bank
(ANB), Bank of Baroda (BOB), Bank of India (BOI), Bank of Maharashtra (BOM),
Canara Bank (CB), Central Bank of India (CBOI), Corporation Bank (COB), Dena
Bank (DB), Indian Bank (IB), Indian Overseas Bank (IOB), Oriental Bank of
commerce (OBOC), Punjab & Sind Bank (P&SB), Punjab National Bank
(PNB), Syndicate Bank (SB), United Commercial Bank (UCO Bank), Union Bank of
India (UBOI), United Bank of India (UNBOI) and Vijaya Bank (VB).

Similarly as far as old private sector banks, new private sector banks and foreign
banks are concerned all of them have not been included in the study. The banks which
existed during the entire study period have been taken excluding those banks which
merged their operations with other banks. The data of the merged banks have not been
incorporated in the balance sheet of banks with which they merged. The data of the
merged bank has been kept outside till the date of merger.

In the category of old private sector banks, 25 banks were working in the year
1985. Out of this 14 banks have been incorporated in the study. The selected old
private sector banks include City Union Bank Ltd. (CUBL), Tamilnad Mercantile
Bank Ltd. (TMBL), The Bank of Rajasthan Ltd. (BORL), The Catholic Syrian Bank Ltd. (CSBL), The Dhanlakshmi Bank Ltd. (DBL), The Federal Bank Ltd. (FBL), The Jammu and Kashmir Bank Ltd. (JKBL), The Karnataka Bank Ltd. (KBL), The Karur Vysya Bank Ltd. (KVBL), The Lakshimi Vilas Bank Ltd. (LVBL), The Nainital Bank Ltd. (NBL), The Ratnakar Bank Ltd. (RBL), The South Indian Bank Ltd. (SIBL), and ING Vysya Bank Ltd. (ING VBL).

Among the new private sector banks which came into existence in the post reform period, there were 9 banks in the year 1995-96 and 7 at the end of the year March 31, 2010. The selected new private sector banks include The HDFC Bank Ltd. (HDFCL), ICICI Bank Ltd. (ICICIBL), IndusInd Bank Ltd. (IBL), Kotak Mahindra Bank Ltd. (KMBL), Development Credit Bank Ltd. (DCBL), Yes Bank Ltd. (YBL), and Axis Bank Ltd. (ABL). The data for the Kotak Mahindra Bank Ltd. (KMBL) and Yes Bank Ltd. (YBL) have been taken from the date of their inception i.e. for KMBL from 2002-03 onwards and YBL from 2004 onwards.

And in the category of foreign banks there were 42 banks in the year 1987 and 34 in the year 2009-10. Out of this 15 foreign banks have been taken for the purpose of study which include Abu Dhabi Commercial Bank Ltd. (ADCBL), American Express Banking Corporation (AEBC), Bank of America NA (BOA NA), Bank of Bahrain and Kuwait B.S.C. (BOB & K B.S.C.), BNP Paribas (BNPP), Citi Bank N.A. (CB N.A.), Deutsche Bank AG (DB AG), Mashreqbank PSC (Mb PSC), Oman International Bank S.A.O.G. (OIB S.A.O.G.), Societe Generale Bank (SGB), Sonali Bank Ltd. (SBL), Standard Chartered Bank Ltd. (SCBL), The Bank of Nova Scotia (BONS), The Bank of Tokyo-Mitsubishi Ltd. (BOTML) and The Hongkong and Shanghai Banking Corporation Ltd. (HSBCL). All of the selected banks had at least one branch in the year 1987.

The other reason for the selection of above mentioned categories of banks was that, all the relevant information was available for the respective years of the study. However in case of left out banks smooth information was lacking.

As far as the public sector banks are concerned, the analysis covers the time period from the year 1980 to the year ending March 31, 2010. As the year 1980 was last year in which 6 banks were nationalized after the nationalization of 14 major scheduled commercial banks in July, 1969. However in case of old private sector banks the
analysis cover the time period 1985 to the year ending March 31, 2010 and in case of foreign banks the time period is 1987 to the year ending March 31, 2010. Since the required and smooth information was not available for the old private sector and foreign banks prior to the period 1985 and 1987. However in case of new private sector banks which came into existence after post-reform period, all information was available from the year ending March 31, 1996. Therefore the time period for the new private sector banks cover the period 1996 to the year ending March 31, 2010.

The reason for confining the study to the year ending March 31, 2010 is that Reserve Bank of India takes minimum one year to report the latest banking statistics in the required format.

The reason for splitting of study period has been the introduction of financial sector reforms in the year 1991. With the onset of financial sector reforms all the banks are now to abide by some pre-determined international standards. Transparency of information and flexibility of operation is becoming increasingly necessary. Since the overall economic reforms had started taking place in the year 1991 onwards in all important sectors of Indian Economy. Therefore the year 1991-92 seems to ushering of a new era of the financial sector reforms beginning.

For the purpose of determining the impact of reforms on the banking sector, the period has been divided into three parts. The public sector banks cover the time period 1980-1991 (pre-reform period), 1992-2010 (post-reform period) and 1980-2010 the whole study period. For old private sector banks, the study period covers the time period, 1985-1991 (pre-reform period), 1992-2010 (post-reform period) and 1985-2010, the whole study period. And for new private sector banks only one period 1996-2010 has been considered, since they came into existence in the post reform period and started publishing their accounts in the year ending March 31, 1996. In case of foreign banks the study period covers 1987-1991 (pre-reform period), 1992-2010 (post-reform period) and 1987-2010, the whole study period.

In order to carry out multivariate analysis and for having better results, the period under study has been reshuffled. The first period covers the years 1980-1995 in case of public sector banks, 1985-1995 for old private sector banks, and 1987-1995 for foreign banks. The second period has been stretched over from the years 1996 to year ending March 31, 2010. The third period covers the whole period from 1980 to the year
ending March 31, 2010 in case of public sector banks, 1985 to the year ending March 31, 2010, for old private sector banks, and 1987 to the year ending March 31, 2010 for foreign banks. And in case of new private sector banks only one period from 1996 to the year ending March 31, 2010 has been considered. Since the new private sector banks started publishing their accounts for the year ending March 31, 1996.

The splitting of the study period in the above mentioned way was because of the certain reasons. The first and foremost reason was the entry of new private sector banks in the post-reform period and publishing of their accounts since the year ending March 31, 1996. The study is intended to compare the performance of public sector, private sector and foreign banks and to find the impact on their performance of the entry of new private sector banks and more and more foreign banks after the year 1996 or in the post-reform period.

The various studies have shown that there has been a significant transformation in the structure of the banking sector. The relative importance of the public sector banks has been declining on account of emergence of new private sector banks and entry of more and more foreign banks. The asset, the deposits and credit share of public sector banks has been declining and share of private sector banks is going up. But the X-efficiency results have shown that there has been no significant change in the level of efficiency of the public sector banks. There has been a marginal decline in the efficiency of the public sector banks in the post-reform period. But taking the post-reform period as a whole, the various studies indicate that the public sector banks are more efficient than the private and foreign banks.

Paroma Sanyal and Rashmi Shankar (2008) the study has shown that Indian private banks dominate the public and foreign banks, both in terms of productivity levels and productivity growth and that competition affects banks differently depending on ownership. Public sector banks productivity shows the growth over the post-reform period and the new private sector banks seemed to have led the change in productivity enhancement. Both old and new private sector banks have much higher productivity than the public sector banks.

The second important reason for splitting of the study period has been the existence of WTO on January 1, 1995 after the conclusions of Uruguay round negotiations on
December 15, 1993 being an initial member of the WTO, India has also commitments to

1. A fair, equitable and more open rule-based system.
2. Progressive liberalization and elimination of tariffs and non-tariff barriers to trade in goods.
3. Progressive liberalization of trade in services.
4. Rejection of all forms of protectionism.
5. Elimination of discriminatory treatment in international trade relations.
6. The maximum possible level of transparency.

India’s entry into the WTO has put the public sector banks in the tougher competition. With entry of new private sector banks and more and more foreign banks, the very set-up of the banking industry has shaken up. Since state owned banks have had lost their monopolies and forced to face stringent competition in their contention with new giants. The government of India has also taken up steps to develop legislation and administration rules complying with the WTO rules. India has to provide greater market access to other countries by eliminating Quantitative Restrictions (QRs), regarding tariff barriers and liberalizing the market for financial services.

The third reason was limited and gradual approach towards liberalization, it would have been considered that the reforms have had taken a time to infiltrate and showing impact on the banking sector. These were the three major reasons for dividing the study period in the above mentioned way.

The entry of new domestic private sector banks and foreign banks has changed the banking industry entirely. The new banks have come with innovative and diversified products, and sophisticated information technology and better customer relationship management practices which are providing edge to the banks over other. In nutshell, assuring service quality to clients seems to have become all the important for existence, growth and differential advantage over their competitors for every bank in India irrespective of their ownership pattern and size.

Bodla, B.S. (2004-05) the study has measured the quality of services provided by commercial banks in India. The study has covered four private sector banks ICICI Bank Ltd. (ICICIBL), The HDFC Bank Ltd. (HDFCL), Citi Bank N.A. (CB N.A.), and ABN AMRO Bank and four public sector banks, State Bank of India (SBI),
Punjab National Bank (PNB), Union Bank of India (UBOI), and Oriental Bank of Commerce (OBOC). The scope has been restricted to Chandigarh, Delhi and Haryana (i.e. Northern India). These banks have been selected by using stratified random sampling but keeping in view the role of these banks in social and economic transformation of the country.

Therefore the study would not have been completed without assessing the quality of services. The quality of services has been assessed by framing a detailed questionnaire. The customer response regarding a particular bank has been obtained on Likerts five point scale from highly satisfied followed by satisfied, average, dissatisfied and highly dissatisfied. For the purpose, four public sector banks, State Bank of India (SBI), Punjab National Bank (PNB), Central Bank of India (CBOI), Bank of India (BOI), four private sector banks, ICICI Bank Ltd. (ICICIBL), The HDFC Bank Ltd. (HDFCL), Axis Bank Ltd. (ABL), The Federal Bank Ltd. (FBL), and four foreign banks, Standard Chartered Bank Ltd. (SCBL), The Hongkong and Shanghai Banking Corporation Ltd. (HSBCL), Citi Bank N.A. (CB N.A.), and Deutsche Bank AG (DBAG). The reasons for picking up of these banks was their branch location in the area selected for the purpose of study, wide presence throughout the country and their business.

The study has been confined to three places of northern India covering Himachal Pradesh, Chandigarh and Delhi. The scope has been restricted to northern India because of constraints, finance and time. The study has been conducted keeping in view the convenience as the respondents were interviewed as and when they had come to their bank for transaction.

The study is based upon primary as well as secondary information. The primary information has been collected by way of customer response for the quality of services provided by the selected banks. The secondary information has been collected from various relevant publications of Reserve Bank of India (RBI) and Indian Banks Association (IBA). In addition to it, information has also been collected from various journals, newspapers, magazines and websites etc.

Sbramani R. Venkata and K.S. Raghavan (2001) the measurement of efficiency is a very peculiar issue in the banking industry. The dictionary meaning of the efficiency is the ratio of output to input. But in every industry where the efficiency is to be
measured, there will be an end product and by-product almost uniform for all organizations. The end product is the one for the production of which the industry or an organization exists. The by-product is the one which is generated when the end product is produced. But the peculiar nature of the banking industry is that while the total business that is the sum of deposits and advances, etc is the end product and profit/income is the by-product for certain years, it is the other way round for certain other players. But here in the present study to resolve this issue both products and by-products are used to measure the efficiency in the banks.

Mithani, D.M. (1998) the growing level of Non-Performing Assets (NPAs) as considered as one of the most important reasons of poor performance of commercial banks in India. In terms of prudential norms, NPAs are defined as a credit facility in respect of which interest remained 'past due’ for a period of four quarters during the year ending March 31,1993,three quarters during the year ending March 31,1994 and two quarters during the year ending march 31,1995 onwards.

One of the important objectives of the financial reforms has been to revive the financial health of the commercial banks by controlling the levels of NPAS. In the present study an attempt has been made to analyze the position of Gross and Net NPAs to Gross and Net Advances for different bank groups. Statistical Tables Relating to Banks in India (1996-97) the levels of NPAs across different banks for the first time were published in the year 1996-97.

In order to depict the profitability position of banks, the following indicators have been selected

1) **Total Income**: Is defined as the sum of interest earned and other income.
2) **Total Assets**: Is defined as the sum of cash in hand and balances with RBI, balances with banks, money at call and short notice, investments, advances, fixed assets, other assets and balance of loss.
3) **Net Interest Margin**: Is defined as the total interest earned less total interest paid.
4) **Total Expenditure**: Is the sum of interest expended, operating expenses, provisions and contingencies and profit and loss.
5) **Total Business**: Is the sum of deposits and advances.
a) **Deposits:** Are the sum of type-wise deposits and location-wise deposits. Type-wise deposits include demand deposits, saving bank deposits, term deposits and other deposits. The demand and term deposits include deposits from banks and deposits from others. The location-wise deposits are the total of deposits of branches in India and deposits of branches outside India.

b) **Advances:** Are the sum of type-wise advances, security-wise advances and sector-wise advances. The type-wise advances are the sum of bills purchased and discounted, cash credits, overdrafts and loans and term loans. The security-wise advances are the total of advances secured by tangible assets, covered by bank/government guarantees and unsecured advances. The sector-wise advances include advances in India and advances outside India. Advances in India include advances to priority sectors, public sectors, banks and others.

6) **Non Interest Income:** Is the sum of income from government commission, exchange and brokerage, net profit(loss) on the sale of investments, net profit (loss) on the revaluation of investments, net profit (loss) on the sale of land, building and other assets, net profit (loss) on exchange transaction and miscellaneous income.

7) **Establishment Expenses:** Relates to expenditure on salaries and other allowances paid to the staff and provisions for employees.

8) **Number of Employees:** Include officers, clerks and sub-staff in India and at abroad branches. Sub-staff include part time employees.

9) **Number of Branches:** Include branches in India and at abroad. Branches in India include branches in rural, semi-urban, urban and metropolitan areas.

10) **Net Worth:** Is the sum of paid up capital and reserves and surpluses.

11) **Operating Expenses:** Include payments to and provision for employees, rent, taxes and lighting, printing and stationary, advertisement and publicity, depreciation on banks property, directors fees, allowances and expenses, auditors fees and expenses, law charges, postage, telegrams, telephone, etc. repairs and maintenance, insurance and other expenditure.
12) **Net Profit/Loss**: Is the difference between total income and total expenditure.

13) **Gross Non-Performing Assets**: As per RBI circular, gross advances means all outstanding loans and advances including advances for which refinance has been made excluding rediscounted bills and advances written off at head office level (technical write off).

14) **Net Non-Performing Assets**: Are Gross NPAs minus

   a) Balance in interest suspense account,

   b) Any receipts from Deposit Insurance and Credit Guarantee Corporation (DICGC) and Export Credit Guarantee Corporation (ECGC) received and held pending for adjustment.

   c) Part payment received and kept in suspense account.

   d) Total provisions made, excluding technical write off made at the head office.

15) **Capital to Risk-Weighted Assets Ratio (CRAR)**: It is confined to the minimum capital requirements for banks. It requires lenders to calculate a minimum level of capital based on a single risk weight for each of the limited number of asset classes under Basel-I framework. Under Basel-II framework capital requirements are more sensitive. It focuses on capital efficiency rather than capital adequacy which imply that banks adopt a more dynamic use of capital in which capital will flow quickly to its most efficient use.

   *Saidenberg and Strahan (1999)* traditionally banks held capital as a buffer against insolvency and liquid assets-cash and securities to guard against unexpected withdrawals by depositors or drawdown's by borrowers.

   Capital that needs to be maintained should be consistent with the risk profile and operating environment. The Basel-II framework is a step in his direction as these norms aim at aligning minimum capital requirements to banks underlying risk profiles. Banks are required to maintain a minimum capital to risk-Weighted Assets ratio (CRAR) of 9 percent. On an ongoing basis, the RBI takes into account the relevant risk factors and the internal capital adequacy assessment of each bank to ensure that the capital held by a bank is commensurate with the banks overall risk profile. This include
the effectiveness of the banks risk management systems in identifying, assessing, monitoring and managing various risks including interest rate risk in the banking book, liquidity risk, concentration risk and residual risk. Under Basel-II framework banks are required to maintain higher CRAR above the minimum requirement.

CRAR is equal to the ratio of TIER-1 and TIER-11 capital to the Aggregate of Risk Weighted Assets (RWA).

\[
\text{CRAR} = \frac{\text{TIER-1} + \text{TIER-11}}{\text{RWA}}.
\]

However, TIER-11 capital cannot be more than 50 percent of TIER-1 capital.

**TIER-1 Capital**: It refers to the core capital that provides the most permanent and ready support against unexpected losses. Equity investments in subsidiaries, intangible assets, losses in current period and those brought forward from previous years will be deducted from TIER-1 capital. It consists of the following components

a. Paid -up Equity Capital.

b. Statutory Reserves.

c. Other Undisclosed Reserves.

Capital Reserves representing surplus arising out of sale proceeds of assets can also be added to TIER-1 capital.

**TIER-II Capital**: It consists of capital elements that are not permanent and are not readily available to meet unforeseen contingencies. Its components are

1) Undisclosed Reserves and Cumulative Perpetual Preference Shares.

2) **Revaluation Reserves**: are the profits arising from increase in the market value of the assets. These can be relied in absorbing losses only if the market value of the assets they represent is subject to fewer fluctuations.

3) **General Provisions and Loss Reserves**: These are not attributable to the actual diminution in value or identifiable potential loss in
any specific asset and are available to meet unexpected losses. These elements will be admitted up to a minimum of 1.25 percent of Risk Weighted Assets.

4) **Hybrid Debt Capital Instruments**: These are the instruments that possess certain characteristics of debt and equity both. When they have close similarities to equity and are able to support losses continuously without triggering liquidation they can be included in TIER-11 capital.

5) **Subordinated Debt**: For subordinated debt to be eligible for inclusion in TIER-11 capital, it should be fully paid-up, unsecured, subordinated to the claims of the creditors free of restrictive clauses and should not be redeemable at the initiative of the holder or without the consent of the bank's supervisory authorities. These are discounted according to the period of maturity.

### 3.3 Objectives of the Study

The major objectives of the present thesis are to study that how performance of public sector, private sector and foreign banks have been affected on account of following the financial deregulation in the economy. How their absolute and relative performance has been affected as aftermath of reforms/globalization. The level of quality of services provided by selected banks has also been analyzed and thorough analysis has been made to derive some concrete conclusions. However to be precise the main objectives of the study are:

1. To compare the performance of public, private and foreign banks and to see whether there exist significant difference in their level of performance.
2. To study the impact of globalization on the performance of public, private and foreign commercial banks in India.
3. To carry out a comparative analysis of the quality of services provided by the selected commercial banks in India.

**Hypothesis**

On the basis of the above mentioned objectives, the following Null hypotheses \( (H_0) \) were developed to be tested in the present study.
H₁. There is no significant impact of globalization on the performance of public, private and foreign commercial banks in India.

H₂. The performance of public sector banks has not been as good as private and foreign banks.

H₃. There is no significant difference in the quality of services provided by these banks in India.

3.4 Limitations of the Study

Taking in to consideration the objectives of the study and its coverage in terms of time span and different types of banks the study is prone to many limitations. Some of the important limitations of the study are

1. The study is based on the financial data as reported by various banks. In such a case the limitations of financial accounting are likely to remain inherent in the study. One such limitation is change in price level which is a major problem. If various financial variables such as total business, deposits, credits, etc. are deflated to the base year, the conclusions drawn by the study may change. However, this does not seem to be a major limitation in the present study, as the figures of the particular year of different banks will be deflated by the same index number. Therefore, the relative position of the banks will remain more or less the same. But the growth rates based upon current prices are definitely going to be misleading to some extent.

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

3. Another limitation is concerning the source of data. Different reports and books show different data of the same time.
4. The impact of reforms on the level of Non Performing Assets could not be made in view of no reporting of data relating to Non Performing Assets in the pre-reform period. Therefore, the growth of Non Performing Assets has only been ascertained in the post-reform period. Similarly, the position of different bank groups relating to Capital to Risk Weighted Asset Ratio and Priority Sector Advances to Total Advances have been analyzed in the post-reform period.

5. The quality of services has been assessed only for selected banks and at a particular point of time. The study would have been much better if quality of services would have been assessed for all sampled banks and at different points of time. Because the study would have given better results by comparing the quality of services at two points of time.

6. Since the objectives, policies and practices of the banks were different in the pre and post reform period. Therefore, an objective comparison between two periods cannot be made.

3.5 Methodology

A sound and scientific methodology is a basic foundation of investigation. The accuracy and availability of the findings hinges on the methodology followed to conduct the study. The review of studies already conducted guide in developing better methods and techniques to accomplish objectives of an investigation. This section is therefore, devoted to explain methodological framework adopted to accomplish objectives of the present study.

In order to know the trends existing in banking sector, the exponential trend values have been computed. Trend is the long-term tendency of the time series to move in an upward or downward direction. It does not include short-run oscillations but indicates the steady movements of the variable over a long period. But time series data on a variable includes short-run oscillations. To remove such short-run oscillations, the data has been smoothened by employing the method of least squares. The method of least squares may be used either to fit a linear trend or a non-linear trend. Under this method, a mathematical relationship is established between the time factor ‘t’ and the variable ‘Y’. A straight line of trend has been obtained by using the equation for a straight line, which is
\[ Y_t = a + bX \]

Where

\[ a = \text{Y-intercept or the height of the line, above origin. That is, when } X=0, Y=a \]

The other constant \( b \) represents the slope of the trend line. When \( b \) is positive, the slope is upwards, and when \( b \) is negative, the slope is downward.

However, if the time series is increasing or decreasing by a constant percentage rather than constant absolute amount, the fitting of exponential trend is considered appropriate. Therefore the equation for compound trend has been applied in the following equation form

\[ Y = a \cdot b^t \]

Where

\( a \) is Y-intercept and \( b \) is the slope of the curve at the origin of \( X \).

\( Y = \) dependent variable.

\( t = \) number of years.

\( a, b = \) regression Parameters.

In the logarithmic form, the function has been used as

\[ \log y = \log a + t \log b \]

In order to compute \( a \) and \( b \) constants the two normal equations have been solved

\[ \sum \log y = n \log a + \log b \sum x \]

\[ \sum (x \log y) = \log a \sum x + \log b \sum x^2 \]

\[ \sum \log y = n \log a \quad \text{or} \quad \log a = \frac{\sum \log y}{n} \Rightarrow a = \text{antilog} \left[ \frac{\sum \log y}{n} \right] \] (i)

\[ \sum (x \log y) = \log b \sum x^2 \quad \text{or} \quad \log b = \frac{\sum (x \log y)}{\sum x^2} \Rightarrow b = \text{antilog} \left[ \frac{\sum (x \log y)}{\sum x^2} \right] \] (ii)

The derivations have been taken from the middle year so that \( \sum x = 0 \)

The progress with respect to different banking indicators among different bank groups have been ascertained, with the help of Exponential Growth Rate (EGR). The Exponential Growth Rate has been computed by the production function

\[ Y = a \cdot b^t \]
Exponential Growth Rate = \(( \hat{b} - 1 \) \times 100)

Where

\( Y, a \) and \( b \) have the same meaning explained above.

\( \hat{b} \) = estimated value of regression coefficient.

In the measurement of error in the prediction of 'y' for an individual 'x' the Standard Error has been computed. Standard error measures the dispersion around a regression line. The smaller the Standard Error, the stronger is the evidence that the estimates are statistically significant. As there are chances that the estimated value of 'y' is different from its observed value. The difference is known as Standard Error of Estimate. The main reason for such error is that the variation in 'y' may not be solely due to variations in 'x'. Some other factors may also operate to cause variations in 'y'. Therefore to ascertain the degree of reliability of the estimated variable, the Standard Error has been computed as follow:

\[
S(\hat{b}_0) = \sqrt{\text{var}(\hat{b}_0)}
\]

\[
S(\hat{b}_1) = \sqrt{\text{var}(\hat{b}_1)}
\]

\[
S(\bar{b}_1) = \sqrt{\text{var}(\bar{b}_1)}
\]

Where

\( S(\hat{b}_0) \) = Standard error of \( \hat{b}_0 \) (\( \hat{b}_0 \) is the intercept of the regression line on the y-axis).

\( S(\hat{b}_1) \) = Standard Error of \( \hat{b}_1 \) (\( \hat{b}_1 \) is the slope of regression line).

\( \text{var}(\hat{b}_0) \) = estimated variance of the intercept of the regression line.

\( \text{var}(\hat{b}_1) \) = estimated variance of the regression coefficient \( b_1 \).

\( \hat{b}_1 \) = estimated regression coefficients.

Since sampling errors are inevitable in all estimates, it is necessary to apply tests of significance in order to measure the size of the error and determine the degree of confidence in the validity of the estimates. In order to test the estimates \( \hat{b}_1 \)'s whether they are significantly different from Zero i.e. the sample from which they have been
estimated might have come from a population whose true parameters are Zero (b₀ and/or b₁=0). And the null hypothesis has been tested

\( H_0 : b_i = 0 \)

Against the alternative hypothesis

\( H_1 : b_i \neq 0 \)

For checking out the level of significance for various regression estimates t-value has been computed as follow

\[ t = \frac{\hat{b}_i}{s(\hat{b})} \]

\( \hat{b}_i \) = Estimated regression coefficient.

\( s(\hat{b}) \) = Standard Error of estimated \( \hat{b} \).

**Coefficient of Simple Determination (r²)**

It is applied to represents the proportion of the total variability around 'y' that is explained by the linear relationship y and x. It has been computed as

\[ r^2 = \frac{\sum (\hat{y} - \bar{y})^2}{\sum (y - \bar{y})^2} \]

\( \hat{y} \) = Estimated values of y given the value of x

\( (y - \bar{y})^2 \) = Deviations of the given observations from mean.

Total variation = Explained variation + Unexplained variation.

Explained Variation is the variation due to variable x is denoted by \( \sum (\hat{y} - \bar{y})^2 \).

Unexplained variation is denoted by \( \sum (y - \bar{y})^2 \).

To derive the estimates of different parameters from different statistical observations the Linear Production Function has been fitted. A production function is said to be linear if the amount of change in one variable tends to bear a constant ratio to the amount of change in other variable. The model of following form has been employed

\[ Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + \cdots + b_nx_n + \epsilon \]

But in order to examine the impact of banking sector reforms on the performance of individual banks, the undertaken explanatory variables were regressed at two different stages using the same production function. The reason for taking of variables into
parts was because it was not possible to regress all variables together as the number of observations in the pre and post reform period were not enough to adjust all explanatory variables together with explained variable. Further, the ratio between number of observations and number of input and output variables need to be specified. Cooper et.al. (2000) stated that number of observations should be at least three times the sum of input and output variables. Therefore the Production function has been employed in the following form

At first stage

\[ Y = a + b_1x_1 + b_2x_2 + b_3x_3 + b_4x_4 + e^u \]

At second stage

\[ Y = a + b_5x_5 + b_6x_6 + b_7x_7 + b_8x_8 + e^u \]

Where

\( a = \text{Intercept, } b_i = \text{regression coefficients and } X_i = \text{dependent variables, } N = \text{Number of input variables, } e^u = \text{error term or disturbance in the relationship representing factors other than } x \text{ that affects } y. \) \( e^u \) also stands for unobserved factors. It does not matter how many explanatory variables are included in each stage. There shall always be factors which cannot be included and are collectively contained in \( u \).

The undertaken variables have been regressed under growth and efficiency criteria. Growth criteria was assessed on the basis of total assets, net interest margins, total expenditure and total business as input variables and total income as output variables. Efficiency has been measured on the basis of non interest income, establishment expenses, number of employees and number of branches as input variables and total income as output variables.

The terminology for simple and multiple regression analysis have been used in the in the one or other way as

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>y</th>
<th>( x_1 + x_2 + x_3 + x_4 \ldots )</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dependent variable</td>
<td>Independent Variables</td>
</tr>
<tr>
<td>2.</td>
<td>Explained Variable</td>
<td>Explanatory Variables</td>
</tr>
<tr>
<td>3.</td>
<td>Response Variable</td>
<td>Control Variables</td>
</tr>
<tr>
<td>4.</td>
<td>Predicted Variable</td>
<td>Predictor Variables</td>
</tr>
<tr>
<td>5.</td>
<td>Regressand</td>
<td>Regressors</td>
</tr>
</tbody>
</table>
**Coefficient of Multiple Determination (R^2)**

It is applied to know the extent to which all the explanatory variables affect the dependent variable. \( R^2 \) is interpreted as the fraction of the sample variation in \( Y \) that is explained by \( X \). **Roscoe (1975)** \( R^2 \) is the simple square of multiple \( R \) and provides an index of the amount of variability in the dependent variable accounted for by the predictor variables.

\[
R^2 = \frac{\text{Regression Sum of Squares (RSS)}}{\text{Total Sum of Squares (TSS)}}
\]

\[
\text{RSS} = b \left[ \sum XY - \frac{(\sum X)(\sum Y)}{N} \right]
\]

\[
\text{TSS} = \sum Y^2 - \frac{(\sum Y)^2}{N}
\]

Where

- \( b \) = Regression parameter.
- \( \sum X \) = Sum of variable \( X \), \( \sum Y \) = Sum of variable \( Y \), \( \sum Y^2 \) = Sum of squares of values of variable \( Y \), \( N \) = Number of observations.

**Adjusted \( R^2 (\bar{R}^2) \)**

The inclusion of additional explanatory variables in the function can never reduce the Coefficient of Multiple Determination and usually tend to raise the value of \( R^2 \) which is increased as the number of explanatory variables are increased in the function. To overcome this lacuna the adjusted Coefficient of Multiple Determination is applied which rightly decreases as new regressors are introduced in the function.

**Tabachnick & Fidell (2001)** \( R^2 \) tends to overestimate the variance accounted for especially with small samples. By introducing new regressor the value of numerator is increased, while the denominator remains the same.

\[
\bar{R}^2 = 1 - (1 - R^2) \frac{n-1}{n-k-1}
\]

Where

- \( \bar{R}^2 \) = Adjusted Coefficient of Multiple Determination.
- \( R^2 \) = Coefficient of Multiple Determination.
- \( n \) = Number of observations.
K = Number of parameters to be estimated excluding constant term.

**F-test**

The F-test is applied to find out whether the explanatory variables \((x_1 + x_2 + x_3 + x_4 - \cdots - x_n)\) do actually have any significant influence on the dependent variable. It tests the significance of \(R^2\). The high values of 'F' suggest significant relationship between Y and X's. It has been computed as follow

\[
F = \frac{R^2 (k-1)}{1 - R^2 (n-k)} \frac{v_1}{v_2} \text{ d.f.}
\]

\(v_1 = K-1\) and \(v_2 = N-K\)

Where

\(R^2\) = Coefficient of Multiple Determination.

\(N=\) Number of observations in the sample.

\(K=\) Number of \(b_i\)'s (including the intercept a)

\(K-1 = \) The degrees of freedom for the estimate based on the 'within' (the means) difference, \(\tilde{\sigma}^2\).

\(N-K = \) The degrees of freedom for the estimate based on the 'within' (the groups) variation, \(\tilde{\sigma}^2\).

\((N - 1) = (N - K) + (K - 1)\)

Total \(=\) Within + Between.

**Bivariate Correlation Analysis**

Bivariate Correlation analysis is applied for measuring the relationships between different parameters. It provides an index of the direction and degree of relationship between different parameters. The Correlation Coefficient is a measure of the degree of the variability of the variables X and Y. When 'r' is positive, X or Y increase or decrease together. When 'r' is negative X and Y move in opposite directions. When 'r' is Zero, both variables are uncorrelated. It was computed as follow

\[
r = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{N \sum X^2 - (\sum X)^2} \sqrt{N \sum Y^2 - (\sum Y)^2}}
\]
\( r = \) Correlation Coefficient, \( \sum XY = \) Sum of product of \( X \) and \( Y \) values, \( \sum X, \sum Y, \sum X^2, \sum Y^2 \) are the sum and sum of squares of \( X \) and \( Y \) variables = number of observations.

**Return to Scale**

For examining the nature of physical and economic returns when all resources are varying, Return to Scale were computed. The nature of Return to Scale is necessary to estimate the scale of profits and hence is crucial for the management. The Return to Scale could be of three types i.e. Constant Return to Scale (CRS), Decreasing Return to Scale (DRS) and Increasing Return to Scale (IRS).

When all inputs are increased by 1 percent the output will change as follow

- = 1 percent, the CRS.
- = < 1 percent, the DRS.
- = > 1 percent, the IRS.

The Return to Scale relationships are accurately affected only if all factors including management are increased in equal proportions. The increased input of management can be increased by two ways, first, management can be increased by adding individuals who also contribute decision making or co-ordinating services and second by fully utilizing the capacities of a single individual. The Return to Scale exhibit IRS when industry is enjoying economies of scale, DRS at the time when facing diseconomies of scale.

For computing Return to Scale the Cobb-Douglas Production Function was estimated. The function is after the name of the distinguished American economists, namely Paul H. Douglas and C.W. Cobbs. In mathematical form it is expressed as

\[
Y = a L^n C^{(1-n)}
\]

Where

\( Y = \) Output, \( L = \) Labour, \( C = \) Capital, \( a \) and \( n \) are positive constants and \( n < 1 \).

In order to measure the relationships between changes in inputs and outputs, the function was estimated as follow

\[
Y = a X_1^{b_1} X_2^{b_2} X_3^{b_3} X_4^{b_4} \cdots \cdots X_n^{b_n} e^u
\]
Where

Y = dependent variable, a = Intercept, i’s are regression coefficients and X_i’s are independent variables = Number of input variables, e^u = error term.

The function has the ingredients of essential non-elasticities. But it can be converted into a linear function in logarithms which give the elasticities of production of each input factor separately and independently. In the logarithmic form, the function can be written as

\[ \log Y = \log a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + \ldots + b_n \log x_n + e^u \]

For this function, the parameters are elasticities and the elasticities of the individual factors are their exponents in the production function. The sum of the exponents shows the degree of 'Return to scale' in production i.e. indicating the percentage by which output shall increase if all inputs are increased by 1 percent. For examining the nature of Return to Scale the following algorithm was used

If \((b_1 + b_2 + b_3 + b_4 + \ldots + b_n) < 1\), Decreasing Return to Scale.

If \((b_1 + b_2 + b_3 + b_4 + \ldots + b_n) = 1\), Constant Return to Scale.

If \((b_1 + b_2 + b_3 + b_4 + \ldots + b_n) > 1\), Increasing Return to Scale.

The algorithm exhibit that if each input is increased by 1 percent, then output is increased by less than 1 percent, by 1 percent and by more than 1 percent and there are decreasing, constant or increasing return to scale respectively.

However, for certain banks, it was not possible to compute Return to Scale using Cobb-Douglas Production Function because of having negative values in the variables. Therefore the elasticities were estimated using the linear Production Function.

The estimated Linear Production Function is

\[ \hat{Y}_i = \hat{b}_0 + \hat{b}_1 X_i \]

is the equation of a line whose intercept is \( \hat{b}_0 \) and its slope \( \hat{b}_1 \). The coefficient \( \hat{b}_1 \) is the derivative of \( \hat{Y} \) with respect to \( X \)

\[ \hat{b}_1 = \frac{d \hat{Y}}{dX} \]
It shows the rate of change in $\hat{Y}$ as $X$ changes by a very small amount. It should be clear that if the estimated function is linear demand or supply function, the coefficient $\hat{b}_1$ is not the price elasticity, but a component of the elasticity, which has been defined

$$n_p = \frac{dY/Y}{dX/X} = \frac{dY/X}{dX/Y}$$

Where

$n_p = \text{Price elasticity}$

$Y = \text{quantity (demanded or supplied)}$

$X = \text{Price}$

Clearly $\hat{b}_1$ is the component of $\frac{dY}{dX}$. From the estimated function the elasticity has been obtained in the following way

$$n_p = \frac{\hat{b}_1}{\bar{Y}/\bar{X}}$$

Where

$\bar{X}$ = the average price of the sample.

$\bar{Y}$ = average regressed value of the quantity i.e. the mean value of the estimated regression coefficients $\bar{Y}_i$'s.

$\bar{Y}$ = average value of the quantity in the sample.

$\bar{Y}$ = is the mean of the estimated values of $Y$ is equal to the mean of the actual (sample) values of $Y$ because

$\hat{Y} = \hat{b}_0 + \hat{b}_1 X$

$\bar{Y} = \hat{b}_0 + \hat{b}_1 \bar{X}$

**Multicollinearity**

To examine the linear relationship among explanatory variables, multicollinearity was examined by computing the correlation coefficients for these variables. If the explanatory variables are perfectly linear correlated the parameters become indeterminate. In most cases there is some degree of intercorrelation among the explanatory variables. The simple bi-variate correlation coefficients for each pair of
explanatory variables were computed and found between zero and unity and the values were tested for the multicollinearity. **Koutsoyiannis (2003)** If the intercorrelation between the explanatory variables is perfect $r_{x_i x_j} = 1$ then the estimates of the coefficients are indeterminate and the standard errors of these estimates become infinitely large. These are known as the consequences of multicollinearity. If the $X$‘s are not perfectly collinear, but are to a certain degree correlated $0 < r_{x_i x_j} < 1$, the effects of collinearity are uncertain.

The issue of multicollinearity arises when there is a strong linear relationship among two or more independent variables. The bi-variate correlations between independent variables having values 0.80 and above also indicate multicollinearity. But the problems with these criteria are:

1. One independent variable may be a linear combination of several independent variables and yet not be highly correlated with any one of them.
2. It is hard to decide on a cut-off point, the smaller the sample the lower the cutoff point should probably be.

**L.R. Klein (1953)** suggests that collinearity is harmful, if

$$r^2_{x_i x_j} \geq R^2_{Y. x_1 x_2 \cdots x_k}$$

Where

$r^2_{x_i x_j}$ is the simple correlation between any two explanatory variables ($X_i$ and $X_j$) and $R^2$ is the overall (multiple) correlation of the relationship.

For testing the multicollinearity, the degree of intercorrelation ($r_{x_i x_j}$‘s) and the overall correlation coefficients ($R_{Y,X_1,X_2\cdots X_k}$) were computed and examined.

To overcome the problem of multicollinearity, dependent variable was regressed on each one of the explanatory variables independently. And thus elementary regressions were chosen who appeared to give the most plausible results on both priori and statistical criteria. Gradually, the additional variables were inserted and their effects on the individual coefficients, on their standard errors and on the overall $R^2$ were examined. A new variable was classified as useful, superflous or detrimental using the following criteria.
1. If the new variable improves $R^2$ without rendering the individual coefficients unacceptable (wrong) on a priori considerations, the variable is considered useful and is retained as an explanatory variable.

2. If the new variable does not improve $R^2$ and does not affect to any considerable extent the values of individual coefficients, it is considered as superfluous and is rejected (i.e. it is not included among the explanatory variables).

3. If the new variable affects considerably the signs or the values of the coefficients, it is considered as detrimental.

**Glauber and Farrar (1967)** has suggested the following criteria for computing the multicollinearity among the explanatory variables by comparing the observed value of $F^*$ with the theoretical value of $F$ with $V_1 = (K-1)$ and $V_2 = (N-K)$ degrees of freedom (at the chosen level of significance).

1. If $F^* > F$, the variable $X_i$ is multicollinear i.e. null hypothesis is rejected.

2. If $F^* < F$, the variable $X_i$ is not multicollinear i.e. null hypothesis is accepted.

\[
F^* = \frac{(R^2 - x_1, x_1, x_2, \ldots, x_k) / (k-1)}{(1 - R^2 - x_1, x_1, x_2, \ldots, x_k) / (n-k)}
\]

$N$ = Size of sample.

$k$ = Number of explanatory variables.

Hypothesis being tested at this stage was

$H_0: R^2 x_1, x_1, x_2 - - - - - - r_k = 0$

And the alternative hypothesis is

$H_1: R^2 x_1, x_1, x_2 - - - - - - r_k \neq 0$

**Dummy Variable**

The impact of banking sector reforms in post liberalized period was examined through employing dummy variable. It is known that over long period of time not only do the function shift (their constant intercept changes) but also their slopes may well be expected to change: elasticities and propensities change over time. The changes in the parameters of a function have been captured by introducing appropriate dummy variable in the function. To capture this shift, the dummy variable 'Z' was introduced.

The Zero value was assigned if observations pertain to pre-reform period and value 1
was assigned to observations of post-reform period. The coefficients of dummy variables were examined and tested for their significance. The Production Function was used in the following form

\[ Y = b_0 + b_1 x_1 + b_2 x_2 + \ldots + b_n x_n + b_n Z + u \]

\( b_n > 0 \)

Where

- \( Y \) = Dependent variable.
- \( b_0 \) = Intercept.
- \( b_1, b_2, \ldots, b_n \) = Regression coefficients.
- \( Z \) = Dummy variable for the shift in the function.

In the pre-reform period, function would be

\[ Y = \hat{b}_0 + \hat{b}_1 x_1 + \hat{b}_2 x_2 \quad \text{(i)} \]

In the post-reform period, function would be

\[ Y = \hat{b}_0 + \hat{b}_1 x_1 + \hat{b}_2 x_2 + \hat{b}_n Z \quad \text{(ii)} \]

\[ = (\hat{b}_0 + \hat{b}_n Z) + \hat{b}_1 x_1 + \hat{b}_2 x_2 \quad \text{(iii)} \]

The shift in function could be shown as

The slope of the production function (the MPC) is assumed to be same in pre and post-reform periods, hence two regression lines are parallel.

The primary data has been analysed by applying various validated tools and procedures. The difference between the three bank groups with respect to service quality was assessed using ANOVA, Discriminant function and service quality indices.
Discriminant Analysis

Discriminant analysis is applied primarily to predict membership in two or more mutually exclusive groups. Darren and Paul (2009) discriminant analysis comes compete with Wilks Lambdas, Chi-Squares, Eigenvalues, group centroids and F’s significance level.

Eigenvalue

It has been calculated by dividing sum of squares between-groups by sum of squares with-in groups. The large eigenvalue value is associated with a strong function.

% age of Variance and Cumulative % age

It always account for 100 percent of variance.

Canonical Correlation

It is applied to more how well function discriminates. A high correlation indicates a function that discriminates well.

Wilks Lambda

It is the ratio of within-groups sum of squares to total sum of squares.

Chi-Square ($\chi^2$)

It has been applied to measure whether the two levels of the function significantly differ from each other based on the discriminant function. A high chi-square value indicates that the function discriminates well.

3.6 Scheme of the Study

The whole study has been divided into three sections. In the first section, first chapter deals with role and genesis of commercial banks in India. The inherent limitations of the system and resultant reforms have been discussed in this chapter. The second chapter brings the review of literature based on library research. The third chapter brings the need, scope, objectives, limitations and research methodology used in the study.

The second section comprises of four chapters. In the fourth chapter, comparative performance of public, private and foreign banks has been evaluated. In the fifth chapter, assessment of public sector banks performance has been made. In the sixth
and seventh chapter the assessment of performance of private sector and foreign banks has been made. In the eighth chapter, the overall performance of public, private and foreign banks has been made using dummy variable to assess the impact of reforms on banking sector in India. And in the ninth chapter, quality of services provided by selected banks has been assessed.

The third section comprises tenth chapter which summarizes the findings and conclusions of the present research and finds their policy implications and offer suggestions for improving the same.
REFERENCES


