CHAPTER II

REVIEW OF LITERATURE, CONCEPTUAL FRAMEWORK AND METHODOLOGY
As we approach the decade of 1990's, it is becoming more and more clear that the productivity of the various organisations and institutions of our economy is of national concern. When the focus is on productivity, productivity of banking industry needs to be paid greater attention as banks in India are being used as instruments of desired social and economic change, especially in the light of European experience that banks play a decisive role in transforming a backward economy into a progressive industrialised economy.

Economists have recognised that the banking system was one of the two agents, the other being entrepreneurship, in the whole process of economic development. Banking industry plays a vital role in shaping the economic destiny of a nation. Banks act like arteries in a human body in supplying credit to the body economic of a country. In underdeveloped and developing economies like India, where propensity to consume is high and, as a result, savings of the people are meagre, banks play a strategic role in attracting more deposits from the people and then in deploying these savings as lubricants for various sectors of economy. The productivity of these arteries of body economic is a major determinant of its sound health.

However, productivity of this vital sector has
emerged as a matter of concern only in the recent past. This is partially due to its service character and partially due to the reason that so far in this sector more emphasis was on 'production' rather than on 'productivity'. The reason being that due to the stage of economic development it was more important to expand and reach maximum number of people and build financial infrastructure essential for economic growth. However, the experience in the recent past has shown that soundness and viability of this vital structure will greatly depend upon productivity. In such a situation it becomes pertinent to examine the levels of, and trends in productivity. Before taking up such an exercise, it is necessary to review the literature on the subject.

Review of Literature

General

The pioneering work in developing the concept of productivity, identification of its sources, its measurement and application particularly to economy and manufacturing industries, has been done in U.S. and others economies of the West by Denison, 1

   - Numerous Occasional papers.
   - Occasional Papers.


   - Occasional Papers.

   - Occasional Papers.

5. Jorgenson, D.W. and Z. Griliches,
Solow\(^1\) etc. Notable contributions also came from Berndt, Nordhans, Norsworthy, etc.

An exchange of views between Jorgenson and Griliches, and Denison\(^2\) helped in clarifying many aspects of productivity and its measurement.

In Federal Reserve Bank of Boston's\(^3\) Conference of June 1980, leading productivity economist's examined the decline in productivity growth in US in the post 1973 period. The discussion primarily centered around the sources of decline in productivity growth.

Neef and Edwin, Dean\(^4\) analysed labour productivity growth in component manufacturing industries in four countries i.e. U.S., U.K., France and Germany and the effect of Industrial composition on total manufacturing growth and the labour productivity slowdown that each country experienced since 1973.

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   - Occassional papers.
Neef measured trends in manufacturing productivity and unit labour costs in the United States, Canada, Japan and 9 European countries during the period 1973-85 and revised them up to 1987.

The Bureau of Labour Statistics, Washington, has been preparing annual measures for many years to keep assess productivity international comparisons of manufacturing productivity and labour costs trends. The latest issue of June 30, 1989, examines the productivity of trend during 1987-88 in USA, UK, Canada, Japan, France, Germany and 6 other Western European countries.

Ostry and Rao examined the productivity trends in Canada during the period 1957-1976 and Stuber examined the possible explanations for the slowdown in productivity growth in Canada during the period 1975-83.

Similarly I.L.O. (Geneva) and O.E.C.D. (Paris) in their studies and reports have been examining various aspects of productivity.

Bright,\(^1\) tested the hypothesis that 'A young and inexperienced labor force - without a prolonged industrial learning process behind it - has been responsible for India's failure during its two initial plans of economic development to achieve an economic breakthrough by means of an industrial revolution' and found that although there is evidence to support his thesis, but it is not strong enough to say that hypothesis is proved.

Economic & Scientific Research Foundation,\(^2\) examined the trends in labour productivity, wages and capital intensity in the organised manufacturing sector as a whole and in ten select Indian Industries over the decade 1953-63.

Brahmananda\(^3\) studied sectoral and aggregate trends of productivity in the Indian economy and his results show that during the period 1950-51 to 1980-81, average annual percentage increase was 1.3 in Capital output ratio, 2.0 in Net Output per worker and only 0.7 per cent in total factor productivity. Labour Bureau, has been compiling productivity indices for selected

\(^1\) Bright, op.cit.


\(^3\) Brahmananda, op.cit.
industries since second five year plan in two series. The indices in respect of both the series and maintained fluctuating trends and the position varied from industry to industry.

**Banking**

Banking Commission (1972) reviewed bank operating methods and procedures and made recommendations for improving and modernising operating methods and procedures, particularly relating to customer services, credit procedures and internal control systems. It also studied cost structure, analysed profitability and suggested measures to improve it. It also examined other important aspects of banking, for example, information systems, management development, training and employee appraisal etc. which will influence the productivity of banks and banking system. It recommended fixing of man-hours for various types of jobs for measuring productivity of the employees. It observed that present methods of working out branch profitability are not appropriate and an integrated costing and financial reporting system is needed. It suggested use of certain ratios for the measurement of operational efficiency of branches.
The productivity, Efficiency and Profitability (PEP) Committee on Banking constituted under the Chairmanship of Sh. J.C. Luther by RBI in April 1976, submitted its report on Oct. 7, 1977. The study period was 1969-75, although certain criteria were applied for shorter period due to non-availability of data.

The Committee admitted that the study is experimental in nature and the results are provisional. According to it indicators (See Appendix I) considered to be appropriate by it may not remain relevant in future. It categorically stated that the set of indicators used by it "does not represent either the first or the last choice".

The Committee used four criteria, namely, productivity, social objectives - spatial, social objectives - sectoral and profitability. Under each criterion, it used a set of indicators. Labour productivity has been assessed in terms of both physical and monetary values. The study used certain broad indicators, for example, the ratio of deposits to cash balances was used as a broad indicator of the efficiency

2. Ibid., para 4.8.
in cash management. It also examined aspects like planning, budgeting, marketings, management information systems (MIS), annual accounts, audit systems, procedures, cash remittance, and currency chests. It analysed banking costs, profitability of operations, pricing of bank services, trends in earnings and expenditures etc. and made number of recommendations.

In its opinion, assessment of operational efficiency i.e. productivity at a more disaggregated and homogeneous level of groups seems more realistic and meaningful than evolving an efficiency measure at the overall level. It found it useful to measure the relative success achieved during a period. It favoured adoption of work measurement techniques and work norms as a means of reduction of costs.

The Committee expressed the view that books of instructions and service manuals being used can be useful in improving the productivity, provided these are updated by a cell on, on going basis. Further, it laid emphasis on proper allocation of work followed up by effective supervision and strict enforcement of discipline as a measure for improving efficiency.

A survey of retail banks of USA, conducted by
American Bankers' Association\(^1\) in 1982, revealed that:

1. Many bankers feel that retail bank office productivity is a critical issue and that productivity, relative to other bank activities, is critical or very important to overall bank objectives.

2. Performance standards and work measurement were the most frequently cited productivity measurement techniques used.

3. Almost half of the top management officials were highly interested in and supported programmes to measure and improve productivity.

4. Teller productivity was identified as the area requiring the greatest productivity improvement efforts.

5. Lack of top management support and employee resistance were identified as main obstacles in implementation of productivity improvement programmes.

6. Only 13 per cent of the responding banks knew about productivity improvement programmes in other banks.

\(^{1}\) American Bankers' Association, op.cit.
Bradford, in his study commented that Canadian banks rank among most efficient in the world. The ratio of non-interest expenses to average total assets for the Canadian banking system as a whole declined steadily from 2.31 per cent in 1977 to 1.84 per cent in 1981. Improvement in Canadian banks' productivity was noticed from other indicators also.

On the contrary Sullivan and Thor observed in their paper that productivity growth in the finance and insurance sector of U.S. economy dominated by banking has been positive since World War II. According to them bank productivity in 1980 was lower than what it was in 1950.

Similar trends in American banks were found by Wright. Ismail, while making comparison of some international banks for 1980, observed that banking

and finance industry in Malaysia has a good foundation for further productivity improvement.

Fanning\(^1\) while examining bank productivity of British Banks observed that although the productivity of the UK clearing bank is improving, they are still heavily overmanned as compared with similar banks elsewhere. He recommended determined effort to reduce labour intensiveness in U.K. banks.

Divatia and Venkatachalam\(^2\) in their study of operational efficiency and profitability of banks proposed to create a composite index, which would explore certain indicators that would suitably represent varied aspects of banks' performance. They recognised the problems in creating such a composite index, some of which will be due to understanding of the term - operational efficiency. The indicators chosen were divided into (a) operational efficiency in terms of productivity (b) operational efficiency in terms of social objectives and (c) profitability. The approach was akin to the approach of PEP Committee.

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Varde and Singh in a study of profitability of commercial banks over 15 years gave consideration to two types of the factors that affect interest rate levels i.e. external factors like monetary policy, fiscal policy and interest rate policy etc. and internal factors, including operational and managerial efficiency of individual banks.

Varde in another paper distinguished between effectiveness, efficiency and productivity and recommended that efficiency of a bank could be classified into four categories i.e. (i) manpower efficiency; (ii) operational efficiency; (iii) commercial efficiency; and (iv) efficiency of ancilliary business. Efficiency according to each category can be measured separately, and measure of efficiency is productivity.

Subrahmanyam, in his papers discussed conceptual issues in productivity measurement and

approach to interbank and intertemporal productivity comparisons. He highlighted some of the conceptual issues that are faced in the total factor productivity (TFP) measurement associated with neutral technical progress. Out of a non-parametric index number approach and a parametric production function approach, he confined to economic implications of non-parametric approach. He examined particularly, the mechanics of Las payres and Divisia index number procedures; their affinity to linear and homogeneous translog production function and preferred Divisia index over Las payres index. Limitations of Divisia index as well as index number approach were also pointed out. He felt that production function approach may be more advantageous as it can handle problems arising due to non-separability of inputs and outputs, non-constant return to scales etc. In his paper concentrating on methodological issues involved in the measurement and comparison of productivity levels in commercial banks at the aggregate level he discussed the use of Kendrick, Solow, Domar and Tinbergen measure for the purpose but settled for the theoretical framework first introduced by Jorgenson and Nishimizu for international economic growth comparisons and developed in detail by Denny and Fuss.
Recognising the difficulties created for measurement by portfolio management approach to evaluation of banking operations, output being financial in nature instead of tangible goods and package of services offered by each being different he attempted to suggest a way out on the basis of certain assumptions. But he himself recognised the difficulty posed due to 'social lending' and other factors.

He established a theoretical link between growth in output per employee and the conventional academic measure of productivity growth i.e. total factor productivity growth. He admitted that the easy way to comprehend productivity differences is to compute the difference in the levels of output employee ratios. He expressed opinion that factor intensity differentials and total factor productivity differentials contribute substantially to differentials in interbank employee productivity.

Desai, 1 conducted a study entitled "measuring staff productivity in bank - A New Approach" in 1981, covering a regional office of a premier bank having 155 branches in the region. Primary objective of the study

was to detect and correct staffing imbalances.

The study emphasised on providing for the management a productivity related staff deployment technique.

He followed it up with another study of Patna Circle of the bank having 607 branches, in 1982. The main objective again was to provide management with a productivity based technique for rational manpower deployment. It identified 'Labour intensive and less labour intensive' banking sectors and identified packets of staffing imbalances. He felt that in a service industry like banking with wide variations in work mix, a universally applicable and fully scientific formula is difficult to evolve in any area of management.

Srivastava in his paper on profitability and work measurement advocated use of work measurement principle in banking to test the efficiency by using these concepts in a simple manner. He identified other uses of work measurement as adjusting current staffing levels, projecting future staffing levels, justifying overtime, determining unit cost and pricing

of services, budgeting staff expenses, comparing employee or branch performance etc. However, practical utility of the application of work measurement concept in banking is questionable.

Shah, in his various papers discussed bank profitability and productivity. He expressed concern about increased expenses and overheads, slow growth in productivity and efficiency, wasteful work practices and doubtful and overdue debts. He disapproved the attitude of banks that higher profitability can result from increased spread and that innovations have a limited role. He favoured written job descriptions for improvement of staff productivity. He also emphasised on reduction of costs, creation of a team spirit improvement in the management for improving bank profitability and productivity.

Godse in his essay 'Looking Afresh At Banking Productivity' observes that productivity aspect is only

   - 'Productivity Movement in Banks Dropped Before it Began'. The Banker (India), Nov. 1977, pp.9-12.

at the conceptualisation stage in the banking industry. He suggests improvement in Productivity through manpower aspects, systems & procedures, costing of operations, capital expenditures/premises etc. Looking into the future, he observed that continued thrust on branch expansion in rural and semi-urban areas, at unbanked centres and backward districts could result in a change in the concept of profit as a corporate objective and as the indicator of productivity. All branches may not reach breakeven and a reduction operational deficit can be a measure of productivity.

Godse,¹ in his conference papers the concept and measurement of productivity in banks. He suggested indicators of productivity which may be used at various levels of management in a bank. He further made certain suggestions regarding improvement of productivity. He expressed the view that for preparing banking industry to face the environmental changes, including changes in work technology in a systematic manner, an integrated multi-disciplinary and total planning effort is necessary.

Kulkarni in his study on developmental responsibility and profitability of banks stated that while considering banks' costs and profits - social benefits arising out of bank operations can not be ignored. He claimed that profit maximisation approach is out of place while referring to profitability of banks. He recognised that while fulfilling the social responsibility, banks should try to make the developmental business as successful as possible, reduce costs, improve banking system and increase the overall productivity.

Angadi in his attempt to measure productivity puts forth a proposition that operational efficiency of a bank is inversely related to the responsiveness of operating costs to the changes in output. The ratio of proportionate change in operating cost due to proportionate change is output treated as a measure of responsiveness of operating costs. Recognising the external and internal factors that affect productivity he expressed the view that operating cost measures most of them. In his opinion efficiency is an important


yardstick for measuring bank performance. In their study for the period 1970-80 Angadi and Devraj found that foreign banks' productivity and profitability was the highest followed by State Bank of India and nationalised banks. Attempt was also made to recognise the factors responsible for declining bank profitability and productivity.

Sadare in his paper examined the issues in the measurement of productivity in commercial banks and stated that there is no positive co-relationship between manpower deployment and deposit, credit and business. He suggested that, if \( P \) represents labour productivity, \( X \) the total income of a bank in a given period and \( Y \) the manpower expenditure then

\[
P = \frac{X}{Y}
\]

and if \( S_1, \ldots, S_n \) be the income from 1, 2, ..., \( n \) services provided by bank during the given period then

\[
X = \sum_{i=1}^{n} S_i
\]

The approach was followed by the Bank Administration Institute, USA.

Satyamurty in his papers discussed the imperative need for improving efficiency, productivity and customer service in banks to help them in accelerating their consolidation process. He suggested the action points which may be paid attention. In another paper he suggested certain performance indicators which can be used for evaluation of the performance of the banks. Bankers' Training College in their paper made an attempt to bring out the factors generally affecting efficiency and productivity. It recognised that business per employee and ratio of average business to establishment expenses are the most popular indicators of productivity. However, it favoured a 'Disaggregated Approach' for measuring the efficiency and productivity of banks. It was favoured that, the performance of a bank could be assessed in the different areas of business development at a disaggregated level in terms of profitability, income generated, costs involved and customer services, the level of disaggregation may be decided in the light of guidelines of RBI and Government of India from time to time.

Department of Banking Operations and Development, RBI, Bombay\(^1\) in their paper observed that, the rapid expansion of bank's activities since 1970 called for a phase of consolidation to improve the quality of banks' operational efficiency, productivity and customer service. It has to be recognised that banks have to go a long way to really improve the overall efficiency, productivity and profitability of banks.

It noted that poor quality of bank assets continues to be a cause for concern in view of large scale industrial sickness and wide-spread defaults in repayment of bank dues. There is an urgent need to develop a healthy work culture which would manifest itself in more motivated work force, greater co-operation between officers and personnel of other categories, a viable concern for rendering prompt and efficient services to bank clients, punctuality and greater orderliness in the conduct of business. It emphasised the need for sustained efforts to improve bank productivity and profitability.

Ojha\(^2\), in his paper made an international comparison of productivity and profitability of public

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sector banks of India making comparison on the basis of per employee indicators and taking the example of State Bank Group and Punjab National Bank noted that Indian banks are the lowest in all accounts. However, such an international comparison will not be fair for number of reasons. He also made an inter-bank/inter-country comparison by relating per capita assets in terms of per capita income of the country concerned. However, he was not satisfied with the results. Analysing the productivity of public sector banks he observed that there has been substantial growth in productivity per employee since 1969 calculated at current prices. Analysis indicated unsatisfactory position in the case of Regional Rural Banks and relatively lower productivity in the private sector banks.

Chopra¹ in her study devoted a chapter to productivity. She analysed productivity of five select national banks. However, the results were highly unreliable as the same were based on figures at current prices.

¹ Chopra, Kiran; Managing Profits, Profitability and Productivity in Public Sector Banking, ABS Publications (Jalandhar), 1987.
Sayeed in his Ph.D. thesis examined correlates of organisational health, productivity and effectiveness in the State Bank of India. It related to some organisational and managerial personality variables related to productivity and effectiveness. The focus was on psychological aspects.

To conclude it can be said that productivity of the banks has attracted attention of bankers and academicians especially during the last fifteen years for numerous reasons. Number of seminars focussed on this aspect of banking. Concept of productivity in banking especially in the light of changed objectives after nationalisation, difficulties in its measurement, the indicators which may be used as measures of productivity and its other aspects have been discussed. While there have been attempts in various papers to analyse trends in productivity, no systematic effort has been made to analyse productivity trends in various banks as well as groups. Generally per employee and branch indicators have been used as measures of productivity.

Existing literature shows that with an exception of a few, most of the papers have analysed the labour or

branch productivity at current prices. Measuring productivity at current prices, especially when measure of input is number of employees or number of branches, is extremely misleading. Various measures of output like deposits, credit, business, spread, total assets, total earnings go up due to rising prices. Therefore, when per employee or per branch ratios are computed, an increasing trend will be indicated. The result will be - 'higher the inflation better will be the productivity'. Relying on such results will amount to patting ones' back because there is inflation.

In fact, internationally, all the famous researchers have measured productivity in terms of real value. In India, also the Labour Bureau, develops productivity indices at constant prices. Therefore, the results obtained so far can not be relied upon. Really speaking, it will be suicidal to measure bank productivity at current prices.

In view of the importance of banking for the economy, and productivity for the economic welfare, an effort to assess the productivity of various banks and the banking industry is necessary. The need is further accentuated due to stress on bank profitability and the role which improved productivity can play in improving profitability. Systematic research of this aspect of
banking is almost absent. There is an urgent need to study the performance of banks and banking industry in terms of productivity.

The need of the Study

Banks play a vital role in shaping the economic destiny of a nation. In supplying credit to the body economic of a country, they serve like arteries in human body. They are the service institutions which supply lubricants in the form of loans and advances to industry, trade and commerce for their smooth working. They deal with the most sensitive, defraudable and pilferable commodity i.e. money. In the vast and complicated economies of the contemporary world, money lubricates the entire economic machinery. Therefore, it is one of the key factors in productivity of other factors.

In a planned economy like ours, the part played by banks is still more valuable and significant as they have to supply credit to the promotional and developmental activities of the society, at the same time restricting credit for socially undesirable and economically less beneficial purposes. Banks are now called upon to shed their tendency to beat the trodden path, and venture in the field of term finance to industry and agriculture. The banks can cope with the challenging functions which
they are increasingly expected to perform in modern economic world, only if they take prompt steps to develop their management on scientific lines, instead of allowing forces of evolution to take care of it.

The banking industry in India has recorded a phenomenal growth in business operations, especially, since nationalisation of 14 commercial banks in 1969. The deposits and credit of the banking industry which stood at Rs.4646 crores and Rs.3599 crores respectively at the time of nationalisation, increased to Rs.125234 crores and Rs.72226 crores in June 1988. Total number of branches increased from 8045 in 1969 to 55015 in March 1988. Since nationalisation, banks have assumed greater significance in the role of an agent for economic renaissance and social transformation because of their vital role in mobilising resources as well as deploying them for meeting the set objectives.

The objective of public intervention through takeover of Imperial Bank in 1955 and Banks of princely states in 1960 to form State Bank of India and its subsidiaries; nationalisation of 14 banks in 1969 and 6 banks in 1980, has been to accelerate the process of economic development in the hitherto unbanked areas,
gradual and planned diversification of credit allocation in favour of neglected sectors and weaker sections of the society. The emphasis has been on social banking.

Growth brings new opportunities as well as problems. The far reaching changes in banking have been achieved at a price. Profits have been, and are under tremendous pressure. Declining profitability forced banks to lay emphasis on reduction of operational costs and improvement in productivity and efficiency.

Furthermore, banks have started facing ever increasing competition in fund raising and its deployment, from corporate sector, financial institutions, mutual funds and postal savings. In a growing capital market more and more companies and public sector corporations are raising funds directly from the public.

Therefore, both external and internal environment necessitates higher level of productivity in banks. Infact, the mammoth increase in volume of business, massive branch network, ever declining profitability of banks, growing indiscipline among employees, falling standards of customer service, competing demand for bank funds and the urgent requirements
of effective social banking make it imperative for banks to be more productive.

In view of its key role, banking industry has to play a dual role of increasing productivity in banks themselves and also attune their operations in a manner that would promote productivity in other sectors of the economy. The need is that banks should make every effort on a continuing basis to bring down costs and improve productivity. However, no serious, systematic and conscious effort is being made by banks to improve productivity and operational efficiency.

A systematic and scientific effort to improve productivity in banks would require an intensive research into its various aspects. A beginning has to be made by determining what is the level of productivity, and what has been happening to it, especially, since the nationalisation of 1969. The review of literature has shown that no serious effort has been made so far to examine the trends in productivity of banks and banking industry.

The findings of individual papers, examining productivity at current prices, are not of any relevance in assessing the productivity and its growth. Measuring productivity at current prices tantamounts to pattering
one's back because there was inflation. Higher the inflation or failure to check price rise better would be the productivity measured at current prices. To initiate research into bank productivity, and to help bank managements and policy makers to develop productivity improvement programmes there is an urgent need to examine the productivity of major banks and the trends in it since 1969. There is a serious gap in our understanding of the inter-bank differentials in productivity over time. There is need to fill in this gap. The need to study productivity, the central element of the problem of prosperity of economy, in banking industry which is the blood-vascular system of body economic hardly needs any further emphasis.

The Scope of the Study

The study examines the trends in productivity in 22 major public sector banks since 1969, the year of nationalisation of 14 major commercial banks. The 6 banks nationalised in 1980 have been left out, as for the greater part of the study period they were in the private sector and were not under the rigorous control of RBI and Government of India. These banks have been
categorised into following two groups:


The basis of this categorisation obviously is, the historical development of these banks.

The productivity trends are examined firstly for each individual bank, group and thereafter for industry as represented by aggregate of these banks.

The period of study is 1969-85. A total of 17 indicators have been used to analyse productivity trends. Banking being service industry, greater attention will be paid to labour or employee productivity.

The present dissertation is concerned with trends and changes in productivity, with particular emphasis on employee and branch productivity, in the Indian banking industry. The dissertation deals with trends, changes and differentials in productivity in different banks and bank groups. The study is not concerned with specifically what factors might have caused these trends and changes. External environment is
almost same for all these banks. Therefore, causes for inter bank and inter group differentials, probably, have to be traced in internal factors. In this context, study of factors responsible for changes in productivity in each bank and group, may be worthy topic of separate dissertations.

Objectives of the Study

The main objective of the present study is to focus the attention of bankers, economists, planners and Government on the bank productivity, which is crucial for improving their low profitability, which is continuously under pressure due to commitments of social banking. Banks can play the role of catalysts of economic development in the long run only by remaining economically viable themselves. The focus on bank productivity shall lead to further research into its various aspects and development of productivity improvement programmes. This main objective is sought to be achieved by pursuing the following objectives in the present study:

1. To study the time trends in productivity in 22 public sector banks since the 1969 nationalisation of 14 commercial banks.

2. To examine the intra group and inter bank
differentials of productivity by classifying banks into two groups i.e. SBI Group, and 14 major commercial banks (nationalised in 1969).

3. To compute the productivity trends in bank groups and study the inter group differentials.

4. To study productivity performance of the industry as represented by aggregate of the 22 public sector banks.

Sources of Data

The possible sources of data were banks, their annual reports, Statistical Tables relating to Banks in India, combined by RBI and Financial analysis of Banks complied by IBA. The use of data from Statistical Tables relating to Banks in India was ruled out as crucial information for the study i.e. number of employees of each banks is not given in this publication. Therefore, primarily the data source is IBA's 'Financial Analysis of Banks'. It was firstly brought out in 1976 containing data relating to 1973-1975. For the sake of consistency most of the data for the year 1969 has been obtained from IBA circulars for that period. The data source is quite reliable as compilation is done on the basis of annual reports and information sought from member banks. However,
some information particularly relating to number of employees for certain banks for certain years was not available. In certain cases the data was available in annual reports for the respective years, but in the earlier periods many banks were not disclosing the figure of number of employees. In such cases gaps were filled from the tables presented in some subsequent annual reports or other published reports of the banks. All the figures, unless otherwise mentioned, are in lakhs of rupees.

**Methodology**

The study attempts to accomplish its objectives by making cross-sectional and inter-temporal analysis on the basis of 17 indicators. These indicators have been divided into three categories. One set of indicators measure output in terms of input of number of employees i.e. labour productivity. Another set of indicators measure branch productivity. The last set of indicators depict productivity on the basis of certain financial ratios. These set of indicators are as follows:-

**Per Employee Indicators (Labour Productivity)**

1. Deposit per employee.
2. Credit per employee.
3. Business per employee.
4. Total expenditure per employee.
5. Total earnings per employee.
6. Establishment expenses per employee.
7. Spread per employee.

**Per Branch Indicators (Branch Productivity)**

1. Deposits per branch.
2. Credit per branch.
3. Business per branch.
4. Total earnings per branch.
5. Total expenditure per branch.

**Financial Ratios measuring Productivity**

1. Total Earnings as percentage of total Credit.
2. Establishment Expenses as percentage of Total Expenditure.
3. Volume of Business per Rs.100 of establishment expenses.
4. Volume of Business per Rs.100 of total expenditure.

Per employee and per branch ratios have been computed at constant prices of 1969. For this purpose financial
figures given at current prices have been deflated by developing deflation index based on average consumer price index during the year. Average of the price index has been computed on the basis of price index at the beginning and end of the year. Consumer price index has been used as the capacity of the people to save is influenced by consumer prices. It is absolutely necessary to measure productivity in terms of real or constant prices. Increase in output measured in monetary terms at current prices during this period of ever increasing prices, will considerably inflate productivity, when input is expressed in terms of non-monetary units. This will mean - 'greater the inflation higher will be the productivity'.

For measuring growth and growth rates, study period has been divided into four equal subperiods of 4 years i.e. 1969-73, 1973-77, 1977-81 and 1981-85. This division has been done by considering the fact that recruitment of employees and opening of branches are not even in different years. Generally, after determining the requirement of employees, the filling up of the vacancies takes period of 6 months to 1 year. Therefore, there is possibility that there may be sudden jump in the number of employees in a particular
year because the recruitment process was completed during that year. Similarly, the opening of new branches is uneven due to various reasons. The distortions created by such factors are evened out to a greater extent when the period taken is longer than one year. Growth rates are compound rates; calculated by taking the figures of beginning and ending year. However, it suffers from the limitation that the rate of growth will be affected by high or low figures of opening or ending year.

As discussed earlier the 22 public sector banks have been divided into two broad categories of SBI Group and nationalised banks.

Inter bank differentials have been analysed within each group i.e. intra group and intra industry.

More than 98 per cent of the total volume of banking activities are handled by public sector banks. In fact, nearly 85 to 90 per cent business is handled by 22 banks included in this study. Therefore industry position has been analysed on the basis of these 22 banks.

T-Scores and Ranking

The combining of scores from separate tests has often posed a difficult problem in transforming raw
scores into some form of standard scores. There are number of scales that can be used. One such scale i.e. T-Scale is based on T-Scores.

T-Scores are normalised standard scores converted into a distribution with a mean of 50 and $\sigma$ of 10. In the scaling of individual items, the mean, as we know, is at zero and $\sigma$ is 1.00. The point of reference, therefore, is zero and the unit of measurement is 1. If the point of reference is moved from the mean of the normal curve to a point $5\sigma$ below the mean, this new reference point becomes zero in the scale and the mean is 5.1

In the present study following formula for determining T-scores has been used.

$$T\text{-Score} = 50 + \frac{10}{\sigma} (X - \bar{X})$$

Where $\sigma$ is the standard deviation of the raw scores, $X$ is the specific score in question and $\bar{X}$ is the mean of the group of scores.

Four types of average scores have been worked out. These are:

**Average T-Scores of Employee Productivity:**

These scores are based on per employee indicators

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of productivity. Out of the seven indicators used, ESTB/E has been excluded for the purpose of computation of average T-scores. The reason for its exclusion is that, of its own it cannot be taken as a measure of improvement or deterioration in productivity. If the per capita income is going up the ratio should also increase, if the ratio remains static, it means that employees were not given benefit for improved economic conditions. Denial of such benefits may adversely affect their productivity. On the contrary, if the ratio is increasing relatively at a higher rate, it has to be examined that whether it contributed in improving employee productivity or not? In computing T-scores of TEXP/E, the sign of net figure in parenthesis was changed. Because if the increase in TER/E is favourable then decrease in TEXP/E would be favourable. On the basis of T-scores of these per employee indicators, average T-scores are calculated and ranking is done accordingly.

**Average T-Scores of Branch Productivity:**

Average T-scores of Branch Productivity are based on five per branch indicators used in this study. Like TEXP/E, the sign of net figure within parenthesis in the case of TEXP/BR is changed for similar reasons. The average of these T-scores has been calculated. Equivalent average scores indicate the same level of
performance. Ranks have been given on the basis of average T-scores.

**Average T-Scores of Financial Indicators of Productivity:**

In computing the average T-scores based on financial indicators of productivity, ESTB % TEXP has been ignored on the ground that, independently it may not be desirable to draw inferences regarding productivity on the basis of this ratio. Therefore, the average T-scores are based on the remaining four indicators. The 'sign' of net figure within parenthesis has to be changed in the case of ESTB % TER, because a decrease in this ratio would indicate growth in productivity.

**Average T-Scores for Total Productivity:**

Average T-Scores on the basis of T-Scores computed for the above mentioned three categories has been calculated as a measure of total productivity. The limitation of this measure is that all the indicators have been given equal weights. This ensures the simplicity, as it will not be easy to determine commonly acceptable individual weights. However, greater importance should be attached to employee productivity.

**Limitations of the Study**

Limitations of the measurement of productivity
have been discussed in the previous chapter.

Due to the nature, subject, objectives, time span, number of banks taken, number of criterions applied and the wide scope of the study, it is prone to certain limitations. Some of these limitations are discussed below:

1. The productivity of a service industry is measured by quality of service provided by it. The present study analyses only quantitative data to determine the trends in productivity in different banks, banking groups and industry.

2. As the most of the data used is financial in nature, the limitations of financial accounting are likely to influence the results. However, attempt has been made to overcome the limitations of ever-increasing price level by converting the financial data into figures constant prices.

3. The window dressing of annual financial statements indulged in by banks to show the achievement of targetted levels of performance in terms of deposits and credit etc., at the time of closing of accounts distorts the actual picture. However,
as the study does not use profit figures in analysis it will not suffer from the common limitation of most of the studies relating to profitability and performance of the banks due to unreliability of figures of profit because of provision of secret reserves.