CHAPTER - 1
INTRODUCTION

1.1. INTRODUCTION

Transport is a fundamental activity that provides mobility to the society. In keeping pace with the economic development and the consequent surge in demand for transport services, both passenger and freight, the various modes of transport have registered substantial growth over the years.\textsuperscript{1} There is no individual today who is not directly or indirectly served by public transport. In fact, the whole structure of industry and commerce rests on the well-laid foundation of transportation. Thus, an effective transport system is a prerequisite for economic development. Of all the types of transport, road passenger transport has been acclaimed as the most important, both in rural and city areas. Roads today carry 85 per cent of the passengers compared to 20 per cent in the early 1950’s. Places have been brought nearer to one another, breaking their isolation which was the characteristic feature of the olden days when this particular mode of transport was not available. In our country, bus transport is cheap and easily available and it is the common man’s mode of transport.\textsuperscript{2}

In India, cities are the centres of political, educational, administrative, commercial, cultural and other important activities. These activities attract floatation of population in cities. Hence, every city in India is afflicted with transportation problems like low speed, high congestion, frequent stoppage and uneven passenger load. These factors result in an increase in operating cost when compared to mofussil transport service. Of course, city service is ensuring higher amount of revenue per passenger-kilometre, but the excess revenue is not adequate to recover the excess cost incurred in city service. Consequently, there is an increasing amount of loss.
Since sizeable amount of national resources are tied up in the State Road passenger Transport Undertakings (SRPTUs), a need for measuring their performance in terms of productivity becomes very essential. This study is unique in the sense that so far no researcher has undertaken a detailed and separate study on the productivity of city services in India.

1.2. NEED FOR THE STUDY

The State Transport Undertakings (STUs) in India are organised under different forms by the governments at the state level. They are basically commercial public utility organisations. As such, there is an imperative need for them to earn enough surpluses so as to maintain their existing operations and to facilitate future growth. In fact, reasonable profit-making by these undertakings cannot be ignored altogether as they are particularly constituted as State Transport Corporations and are required to act on business principles. It shall be the general principle of a Transport Corporation that in carrying on its undertaking it shall act on business principles. But the STUs are presently passing through a financial crisis. The net losses incurred by them are ever increasing. Out of 45 STUs reported, 39 undertakings have incurred losses during the year 2000/01. Thus, the need for reorienting the working of the STUs with a view to making them financially healthy is becoming increasingly obvious.

In order to overcome the financial crisis, the STUs have to either increase the fare to seek additional revenues or cut down cost. To some extent fare revision is permissible with the approval of state government and the society. The third alternative is cutting down services and passenger amenities. Even as the operational costs go on increasing because of the increase in the incidence of taxation, rise in price of vehicles and spare parts and increase in personnel cost, it is not possible to increase the fares in time and to the extent needed because of
public pressure. But these have had no effect on their performance. This poor financial performance apparently has been the main cause for the poor image of these undertakings. STUs should, therefore, think of improving their productivity. The concept of productivity can solve many of the ills that beset STUs if correctly understood and implanted. However, their productivity has also been far from satisfactory. In this context, the performance of the STUs has been criticised by many especially on their productivity. STUs have been suffering due to low value added, heavy capital investment, excessive staff strength, capital deepening, overage of buses and breakdown and accident, low load factor and increase in cost of materials. These are serious bottlenecks for productivity.

The economic and social objectives of the SRPTUs cannot be achieved unless these limitations are overcome at the right time. Improving productivity of labour, capital and material, as well as generating more value added, and achieving high load factor, reducing cost on personnel and material and reducing overheads are some of the ways in which the financial crisis of STUs can be overcome. It is in recognition of these considerations that the present study has become imperative. Besides, the need for such a study has been apparent for the following reasons:

1. There exist serious productivity differentials among the SRPTUs, despite a number of common features and characteristics in their operations, organisation, management and materials utilisation and these differentials need, therefore, to be investigated and explained.

2. That the studies carried on so far in this area have attempted to measure and analyse the productivity of the vehicle, manpower, fuel and material by taking vehicle kilometres as output and a few studies carried on by taking passenger kilometres as output paying little attention to comparing and contrasting
productivity differentials of the STUs operating either in mofussil regions or city regions.

3. That these studies throw little or no light on analysing productivity through factor inputs of labour and capital and net output measure.

Finally, it is felt that the observations made and conclusion drawn in this work would be generally applicable to similar STUs where the object is to improve their productivity. In this sense, this work will make a useful contribution to the existing body of knowledge on the subject of productivity, viz. partial productivity and total factor productivity of STUs operating city services in India. In this study State Transport Undertakings (STUs), State Road Transport Undertakings (SRTUs) and State Road Passenger Transport Undertakings (SRPTUs) are interchangeable.

1.3. STATEMENT OF THE PROBLEM

The financial as well as physical performance of all the SRPTUs is far from satisfactory and majority of them are heading for a total breakdown. The general impression that is gaining ground is that the SRPTUs are in financial doldrums and are a drain on the limited resources of the state. The present state of affairs of SRPTUs in India is the cumulative effect of many adverse factors. A mofussil service on good trunk routes with favourable fare structure may show considerable profits, whereas city services may incur losses because of poor co-ordination between the supply and demand at peak hours, traffic congestion along routes, low operating speed, high operating costs, variations in travel demand, improper scheduling and operation of uneconomic routes. Several studies have pointed out that the major reasons for the losses are: dead kilometres, low productivity of human resources, delays in revision of fares, increase in the prices of inputs, civil disturbances, low fleet utilisation, low vehicle utilization, high bus - man ratio, occasional disturbances of political procession, general increase in automobile population, age of vehicle, traffic
diversion either permanent or temporary, poor physical performance, variations in the travel demand, improper scheduling and routing, lopsided operational policies, management's interest in acquiring new fleet than giving attention to maintenance of existing vehicles, concession or free pass given by State Government (from time to time to various sections of commuters such as students, physically handicapped persons, journalists, freedom fighters, etc.), high level of taxation, interest burden, operation of uneconomic routes, political interference, social obligation, lack of commitment among workers and lack of professionalism among top management. Hence, the financial viability of SRPTUs is seriously impaired in these circumstances. Recently, because of the continuing financial crunch of the Central and State Governments, budgetary support for the SRPTUs was also curtailed forcing them to become financially unviable. All these imposed constraints on their capacity to generate profits after paying taxes. Even in this working environment, some SRPTU’s managed to harness profits. This amply demonstrates that within the existing framework also there prevails scope for improvement.

Based on the earlier studies on the productivity performance of SRPTUs and the report of the planning commission, the following constraints hampering the performance of the SRPTUs are identified for the present study:

The problems such as the persistent low rate of labour, capital and material productivities as well as total factor productivity, low generation of value added, high personnel cost, heavy capital investment in fixed assets, low load factor, high capital-labour ratio and deteriorating labour-management relations are mostly responsible for low productivity faced by the management of SRPTUs. This led to the following research question to be resolved in the present study.
Whether the partial productivity and total factor productivity increases with variables such as size, capital intensity, load factor, quality of service and labour management relations?

1.4. OBJECTIVES OF THE STUDY

Generally, the objective of the study is to analyse partial productivity and total factor productivity of the selected SRPTUs in India which operate city services only. More specifically, the objectives of the study are:

i) To review the conceptual and measurement issues in productivity.

ii) To present the profile of selected SRPTUs operating city services in India.

iii) To analyse the trends in productivity measurement variables and determinant variables of SRPTUs in India.

iv) To examine the trends in productivity of selected SRPTUs in India.

v) To identify the determinants of productivity of selected SRPTUs in India.

1.5. HYPOTHESES

Based on the questions cited earlier, the following hypotheses are framed:

1) Productivity is an increasing function of size.

2) Labour productivity and material productivity increases with capital intensity.

3) Capital productivity as well as total factor productivity declines with capital intensity.

4) Productivity is an increasing function of load factor.

5) Productivity is directly related to the quality of service.

6) Productivity is directly related to the labour -management relations.
1.6. METHODOLOGY OF THE STUDY

This study is confined only to State Road Passenger Transport Undertakings in the public sector which operate city services in India. In other words, SRPTUs operating mofussil and hill services are excluded from the present study. Out of 10 SRPTUs operating city services, 7 have been operating for more than 20 years and 3 for less than 20 years. As the study covers a period of 20 years, the undertakings which have been operating for more than 20 years are considered here. Due to non-availability of data for a few years of the study-period, one city transport corporation has been excluded from the study.

This study is confined to the productivity of six SRPTUs which provide mainly city services in India. They are Bombay Electric Supply and Transport (BEST), Metro Transport Corporation Limited (MTC), Ahmedabad Motor Transport Services (AMTS), Pune Municipal Transport (PMT), Kolhapur Municipal Transport Undertaking (KMTU) and Pimpri Chinchwad Municipal Transport (PCMT). In this study, productivity refers to the relationship between output and inputs. More specifically, the concepts of productivity used in this study are: labour productivity (LP), capital productivity (CP), total factor productivity (TFP), material productivity (MP), fuel productivity (FP) and tyre productivity (TP). The output used to measure productivity is gross as well as net concept of output. The gross output is denoted as sales (i.e. traffic revenue in case of passenger transport undertakings) in real term, whereas net output is termed as value added (sales minus intermediate inputs) in real term. The intermediate inputs used here are bought-in materials (oil, diesel, spare parts etc.) and services (miscellaneous expenses including telephone, repairs etc.) necessary for the operation of passenger transport services. The output and inputs are used in financial term and not in physical term. The personnel cost in real term is used as labour input, whereas the gross fixed assets in real term are used as capital input. On the other hand, the cost of fuel, tyre and other materials
in real term is used as material input. The ratio of net output to labour input is termed as labour productivity, whereas the ratio of net output to capital input is called capital productivity. Further, the ratio of net output to the sum of labour and capital inputs is denoted as total factor productivity.

On the contrary gross output is used to measure material productivity. The ratio of gross output to material input is termed as material productivity. Similarly the ratio of gross output to fuel input is termed as fuel productivity, whereas the ratio of gross output to tyre input is called tyre productivity. The total factor productivity is calculated by using Kendrick and Solow measures.* The Kendrick measure of TFP is calculated as:

\[ TFP = \frac{V_t}{W_tL_t + r_tK_t} \]

On the other hand, the Solow measure is obtained by:

\[ TFP = \frac{\Delta P_t}{\Delta L_t} = \frac{\Delta Y_t}{\Delta L_t} \left( W_t \frac{\Delta L_t}{L_t} + r_t \frac{\Delta K_t}{K_t} \right) \]

The factors such as size of firm, technology, capacity utilisation, capital intensity, quality of service and labour-management relations are used as determinants of productivity. The gross output as well as net output is used as a proxy for size of firm. Capital intensity (capital – labour ratio) is used as technology factor, whereas load factor is used as capacity utilisation. Load factor is the percentage share of passenger kilometres obtained to the passenger kilometres offered. Further, the quality of service is measured in terms of breakdown and accident and labour management relation in terms of time period.

* The detailed methodology have been given in p. 50
1.7. DATA SOURCES

This study is mainly based on secondary data. The data relating to the productivity of the selected SRPTUs have been collected from the “Performance Statistics of State Transport Undertakings” published by the Central Institute of Road Transport, Pune, India, for the Association of State Road Transport Undertakings for the period from 1981/82 to 2000/01. Besides, information has been gathered through personal discussions with the experts, executives and with the Officials of the Central Institute of Road Transport, Pune, India.

The data on Consumer Price Index (CPI) and Wholesale Price Index (WPI) have been obtained from the Reserve Bank of India Bulletin, jointly issued by its Economic and Statistical Department using 1981/82 as the base year. The data on Product Price Index (PPI) for respective sample undertakings have been calculated by dividing the total traffic revenue by the total passenger kilometres of the respective sample units concerned.

1.8. PERIOD OF STUDY

The present study covers a period of 20 years from 1981/82 to 2000/01 in order to draw the trends in productivity taking 1981/82 as base year. Mrs. Indira Gandhi, the late prime minister of India, was an ardent supporter of productivity improvement in all walks of life. During her prime ministership, the country observed twice, first in 1966 and again in 1982, as, “year of productivity”, while addressing the gathering to mark the occasion for handing over the offshore platforms by the Mazgaon Docks Ltd to the Oil and Natural Gas Commission, Mrs. Gandhi observed that productivity and innovation are necessary for the economic growth of public enterprises. Hence 1981/82 has been selected as base year for the study.
1.9. STATISTICAL TOOLS

The statistical tools like index number, mean, co-efficient of variation and growth rate are used to analyse the trends in productivity variables, whereas the regression and ‘Durbin-Watson Test’ are used to examine the factors that determine productivity.

Index number is used to measure the level of a certain phenomenon as compared to the level of the same phenomenon at some standard time. In order to know the behaviour of each identified variable, simple arithmetic mean has been carried out. Co-efficient of variation is used to compare the variability of two or more series of data. The ‘t’ tests are employed to test significance of growth rate, correlation and regression co-efficient. Regression is used to estimate the degree and extent of inter-relationship between the dependent variables and independent variables. Durbin Watson Test has been used to find the presence of auto correlation among variables used in regression function. The Kendrick and Solow measures have been used for analysing the trends in total factor productivity. Kendrick’s measure is based on linear production function and Solow measure is based on the rate of productivity change between labour and capital.

1.10. LIMITATIONS OF THE STUDY

1. The study does not consider vehicle kilometre or passenger kilometre as output.
2. It does not consider either employment (number of employees) or man-hour or man-days worked as labour input.
3. The capital input does not include investments as well as working capital. Only gross fixed capital is considered.
4. The study does not consider spare parts productivity individually.
5. The quality of service does not include casualty and punctuality in service.
6. Though the researcher tried to regress productivity with many variables such as size of operation, capital intensity, load factor, labour-management relations, quality of service, fleet strength, fleet in operation, passenger kilometre, labour cost index, material cost index, fuel cost index, tyre cost index, and gross fixed cost index, only the best regression obtained has been presented. The regressions with variables such as age of the fleet, road condition, speed, population, route-kilometre are not considered in this study.

1.11. CHAPTER SCHEME

Keeping the objective in view, the study is organised into eight chapters, including introduction and conclusion.

The first chapter, ‘Introduction’, is introductory in nature. It covers the need and importance of study and statement of the problem. It also explains the objectives, hypotheses, methodology followed, limitations of the study and chapterisation.

The second chapter, ‘Review of Literature’, is devoted exclusively to present the review of literature on productivity in transport sector as well as productivity in other sectors.

The third chapter, ‘Measurement of variables’, examines the concept and measurement of output and inputs, viz. labour, capital and material as well as the concept and measurement issues in productivity.

The fourth chapter, ‘Profile of Selected SRPTUs’, presents the origin as well as the general performance in terms of fleet strength, fleet in operation, number of employees, passenger-kilometre, fixed assets, total revenue, personnel cost, material cost, profit and value added.
The fifth chapter, 'Trends in variables', examines the trends in variables used in productivity measurement, viz. labour input, capital input and material input, as well as the trends in variables influencing productivity, viz. size, capital intensity, load factor, capital-labour relations, quality of service and labour-management relations.

The sixth chapter, 'Trends in Productivity', highlights the trends in labour productivity, trends in capital productivity, trends in total factor productivity under Kendrick and Solow measures. Further, trends in material productivity, fuel productivity and tyre productivity are also analysed.

The seventh chapter, 'Determinants of Productivity', examines the factors influencing the productivity using production function of labour, capital, total factor and various material productivities.

Chapter eight 'Conclusion and Suggestions' dovetails the summary of findings and conclusion arrived at in the previous chapters. Based on the findings a few suggestions are also made for the improvement of productivity in the selected State Road Passenger Transport Undertakings.
REFERENCE

1. Industrial Herald Business and Industrial Monthly P 46, September 1999.


