CHAPTER - I
INTRODUCTION

As countries move through the process of development, the share of agriculture in gross domestic product declines and that of industry and services rises. Unlike agricultural products, industrial goods and services are produced more efficiently in densely populated cities that provide access to a large pool of skilled manpower, a network of complementary firms that supply various inputs to one another, and a large number of consumers. For this reason economic development is always accompanied by the growth of urban population. This close association between economic development and urbanization has evoked extensive research on various aspects of urbanization. A number of themes can be discerned in the studies on urbanization. The pace, pattern and regional variation in urbanization in a country is one important theme that has been extensively analysed. The problems that emerge with the concentration of population in cities have also attracted considerable attention of economists and other social scientists. A third theme on which many studies have appeared in developed counties is the nature of size distribution of cities in a country and changes in it over time. Similarly, the pattern of variation in growth rate of cities in a country and the factors that explain that variation has also been analysed by many economists in developed countries. A large number of studies have appeared on each of these four aspects of urban growth in developed countries.

In developing countries like India most of the studies on urbanisation are confined to the analysis of pace, pattern and regional variations in urbanisation. Some studies have also appeared on various problems created by urbanisation such as urban poverty, slums, pollution, environmental issues and crime etc. In India also studies have been conducted on these two aspects of urbanization by economists and demographers. However, the nature of size distribution of cities has not been analyzed by researchers in developing countries. Similarly, the
pattern of variation in the growth rates of cities and the factors that explain that variation has not been explored by researchers in less developed countries. Not even a single study on these two aspects of urbanization in India has been traced. The present study is an humble attempt to provide some information and analysis on the pattern and determinants of variation in the growth rate of cities in India during the 1991-2001 post-reform period.

I. Size Distribution of Cities

The urban population of a country is always clustered into a large number of cities of different size, type and origin. The cities of a country differ from one another not only in size and functional specialization, but also in terms of income level, unemployment rate, civic facilities, crime rate and many other features. This wide variation in the size distribution of cities of a country provides good material for understanding the process of growth of urban population more deeply. The analysis of nature of size distribution of cities has been done by many economists in developed countries. One of the earliest studies on this theme is by Colin Clark (1945) who analyzed the functional specialization of cities in U.S.A., U.K., Canada and Australia. Since then a large number of studies have appeared on this theme and even in the last one decade two major studies on the size distribution and growth of cities in developed countries have appeared (Jan Eekhout, 2004, and G. Duranton, 2007). A brief review of most of the relevant and important of these studies is given in the second chapter. Here the main findings of these studies are mentioned to provide the necessary backdrop to the present study. The main findings of these studies are:

1. A diverse size distribution of cities exists in every developed country; some very big metropolitan cities coexist with a large number of medium sized and small towns.

2. The size distribution of cities in a country mostly follows the log-normal distribution. However, the sub-set of larger cities follows the rank-size rule.
According to which the product of city size rank and city population is approximately constant and equal to unity.

3. Inspite of the great variation in the growth rates of cities, the size distribution of cities in a country remains more or less stable.

4. In small countries and ex-colonial countries the port city, that is also the capital city in most cases, dominates the size distribution of cities by concentrating most of the urban population of the country in it.

II. Growth Pattern of Cities

Irrespective of the rate of growth of urban population in a country, various cities of the country always grow at very different rates. One always observes, in every country and in every time period, very fast growing cities coexisting with many slow growing cities and some stagnant towns. There are even a few declining cities that are losing population. This diversity in the growth pattern of cities has been noted by economists from the earliest and efforts have been made to analyze the role of several factors in creating this diverse pattern of growth rates of cities in a country. One of the earlier studies that explored the role of different factors in the growth of cities is by J.G. Williamson and J.A. Swanson (1966), and one of the more recent is by R. Bradley and J.S. Gans (1998). Most of the studies on pattern of growth and determinants of variation in the growth pattern of cities are reviewed in second chapter. The important conclusions from these studies are mentioned here to provide the necessary background to the objectives of the present study:

1. A diverse pattern of city growth rates is always observed in every country in every time period. The fast growing cities are found to coexist with slow growing and stagnant cities in the same country.

2. The growth rate of cities is independent of city size. The large and small cities grow at similar rates, on an average.
3. The important factors that are supposed to influence growth rate of a city are: city size, functional specialisation of city, city connectivity, weight of government sector in the city etc. In addition to these economic factors many non-economic factors also impact city growth rate, e.g. favourable geographical location, political and historical factors etc.

III. Role of Agglomeration Economies and Congestion Costs in Growth of Cities.

All cities of a country never grow at the same rate; some grow at a fast rate, some at a slow rate, and some even stagnate. Moreover, even the same city grows at different rates at different period of its existence. The variation in the growth rate of cities is the result of choice of a larger number of people, firms and traders to settle in a particular city. A city preferred by relatively more people grows faster than other cities, and reverse is the case of cities that grow slower. The declining cities are being abandoned even by their existing residents who prefer to settle in some other city. The decision of firms, workers and consumers to settle in a particular city is largely determined by the benefits provided by that city in terms of employment and income earning opportunities, civic and health facilities and many other economic and non-economic attractions. The firms are attracted towards a particular city by the availability of infrastructural facilities, a large pool of trained manpower, lower tax rates and big size of the city market. All such positive factors attract firms and people towards a city, but there are some negative features that repel firms and people from a city. The important negative features that repel people and firms from a city are high crime rate, high unemployment rate, high pollution level, high land rent, high commuting costs, greater congestion on roads and inadequate public facilities. It is the interaction of these positive factors, (that attract), and negative factors, (that repel), that determines the rate of expansion of city population. The cities of a country differ from one another in the weight and strength of these positive and negative factors that attract and repel people and firms.
Almost all the benefits and negative factors mentioned above are at a higher level in bigger cities than the smaller cities. The benefits provided by big city size to firms and people are the result of scale and agglomeration economies. The literature on scale and agglomeration economies is vast. One of the more recent study on the role of agglomeration economies and diseconomies in city growth is by E.D. Glaesar and J.D. Gottlieb (2009). The role of agglomeration economies and diseconomies in city growth is discussed in some detail in fourth chapter. Here a synoptic view of the agglomeration economies and diseconomies is given to provide the necessary backdrop to the present study. The scale economies are both financial and technological. The financial economies arise from discounts when firms purchase inputs on bigger scale and volume. The technological economies arise from bigger size of the plant that lowers average cost of production. The agglomeration economies arise from localisation of a large number of firms producing the same product in the same city, and urbanisation economies arise from clustering of a large number of different types of firms in the same city. The localisation economies to clustered firms producing the same good arise from sharing of a dependable pool of specialised manpower and other inputs, access to shoppers who are attracted to places where there are many sellers, and provision of highly specialized goods and services tailored according to the needs of the buyers. The urbanisation economies arise from a large number of diverse production activities occurring in the same city. Such clustering of firms and specialised manpower results in faster innovation of ideas and processes, lower per unit cost of providing infrastructure and better and faster matching of specialised skills. As a city expands in size benefits from scale and agglomeration economies increase, but at the same time crime rate, pollution level, land rent, commuting time and cost and congestion also increase. The relative weight of these two sets of factors varies from city to city and from time to time for the same city. That is why one always observes cities of a country growing at different rates, and also the same city growing at different rates in different periods. So, as the size of a city expands two opposing forces get
generated. On one hand, various scale and agglomeration economies tend to accelerate the expansion of city population, while on the other hand, various negative externalities and congestion costs act as breaks and tend to slow the expansion of city population. The observed size of a city, therefore, is the result of interaction and balance of the two forces that attract and repel people and firms to and from the city.

IV. The Present Study

Unlike the developed countries the issue of size distribution of cities and growth pattern of cities has not been paid much attention by researches in developing countries like India. Not even one study on the pattern and determinants of variation in the growth rate of cities in India seems to exist. That is what prompted the choice of this theme for doctoral research. The importance given to the study of cities in the World Development Report of 1999 added further to the suitability of this topic for research. It has been emphasized in the World Development Report of 1999 that in modern economies dynamic fast growing cities act as the main engines of growth. The existence of many empirical studies on this theme in developed country helped in formulating the objectives and research design of this study. The availability of secondary data on Indian cities in the Census of India publications confirmed the suitability of this topic for the present study. However, it was not possible to explore all the aspects of size distribution and growth pattern of cities that have been studied by economists in the developed countries. To keep the study manageable it is focused on one important aspect of growth of cities, namely the pattern and determinants of variation in the growth rate of cities in India during 1991-2001 period.

1 Objectives of the Study

The main objectives of the study are:

(i) To describe the pattern of growth of cities in India during 1991-2001 period.
(ii) To assess the extent and analyse the variation in the growth rate of cities in India during this period.

(iii) To describe and analyse the functional specialisation of Indian cities in the early 1990's.

(iv) To analyse the relationship between city size and functional specialisation of cities in India.

(v) To analyse the relationship between city size and city growth rate in India during 1991-2001 period.

(vi) To identify some important factors that explain the variation in growth rate of Indian cities during 1991-2001 period.

(2) Research Hypotheses

To carry out the objectives of the study and to organize the data analysis the following tentative hypotheses were framed. These hypotheses have been derived from the broad conclusions on the growth pattern of cities in developed countries as reported in various studies that have been reviewed in chapter two. The purpose was not to test these hypotheses as such in Indian conditions, but to use these as guides in analysis of data on growth of cities in India.

(i) Cities in India grew at very diverse rates during 1991-2001 period.
(ii) Many cities in India have become functionally specialised.
(iii) The bigger cities are more functionally specialised than smaller cities.
(iv) The growth rate of Indian cities during 1991-2001 period was independent of city size.
(v) The pattern of growth of cities in India differs considerably across the states.
(vi) The functionally specialised cities grew at a faster rate than the diversified cities.
(vii) The better connected cities (connected by road and rail etc.) grew at a faster rate than the poorly connected cities.
(viii) Cities with higher proportion of government employees, (such as district head quarters and state capitals), grew at a higher rate than other cities.

(3) Data and Methodology

This study is based entirely on secondary data that were taken from Census of India publications for the years 1991 and 2001. The 1991-2001, post-reform period, was chosen for analysis because of the following reasons; (i) this was the latest decade for which city wise population and other data were available at the time the study was started; (ii) as a result of liberalisation of the economy in early 1990s most of the restrictions on free mobility of capital, firms and labour across the cities were removed and consequently economic factors that attract people and firms to particular cities came in full motion; (iii) to keep the study manageable only one decade could be taken up for analysis.

The bench mark of the present study is the set of cities that existed in 1991, and out of the 2001 set of cities only those were included that also existed in 1991. This was necessary because to calculate the growth rate of a city during 1991-2001 period information on city population both in 1991 and 2001 was required. The Census definition of city was used, i.e., all those population clusters that were defined as cities/towns in census of 1991 and 2001 were included in our data set. Since state wise analysis of pattern and determinants of growth of cities is also taken up, so the study is confined to the following 16 major states of India as these existed in 1991:

Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

The smaller North-eastern states were excluded because only a few cities in each of these states did not make them suitable for state level analysis of pattern and determinants of growth of cities. The state of Jammu and Kashmir was excluded because no data for that state for 1991 was available. So the all
India analysis is based on the set of cities that existed in these 16 states in the years 1991 and 2001, plus Delhi and Chandigarh. The latter two cities were included because these exist within the all India cluster of 16 major states. In 1991 the total number of cities in 16 major states of India was 3544; but complete data on all the relevant variables was available for 2671 cities only. So our analysis is based on 2673 cities, (2671 plus Delhi and Chandigarh), i.e., about 75 percent of all cities that existed in these 16 states of India in 1991. However, these 2673 cities contained 92.46 percent of total urban population of India in 1991. Therefore, the results of this study are likely to represent the general trend of growth of cities in India much better than a study based on a small sample of cities. In addition to the information collected from 1991 and 2001 census publications, information was also collected from road maps of states, (for city road connectivity), and political maps of states for location of district head quarters and state capital cities.

The methods and techniques of research used in the study consist of simple tables, growth rates and regression analysis.

For calculating the growth rate of city population during 1991-2001 period the standard compound growth rate formula, given below, was used.

\[ X_1 = X_0 (1+g)^t \]  \hspace{1cm} (1)

Where \( X_1 \) = population of city in 2001

\( X_0 \) = population of city in 1991

\( t \) = time period between 1991-2001

\( g \) = percent per year growth rate of city population between 1991-2001

For calculating the growth rate of population of each city over 1991-2001 period the above formula was converted into log form given below:

\[ g = \frac{\text{Antilog (log } X_1 - \text{log } X_0 t)}{t} -1 \] \times 100
Both univariate and multiple regression models have been used to analyze the relationship between size of city and functional specialization of labour force of city and also to study the impact of size of city and some other factors on city growth rate. In the regression analysis both quantitative variables as well as qualitative variables are used. The quantitative variables used are growth rate of city, population size of the city in 1991, percent of city labour force in Primary, Industry, Trade and Commerce, Transport and Communication and Other Services. The impact of qualitative variables like road connectivity of the city, weight of government sectors in the city and location of the city in southern India was analyzed by creating suitable dummy variables that take value ‘1’ if particular qualitative attribute is present in a city, e.g. it is situated on a national highway, and value ‘0’ if a city does not have that qualitative attribute. The standard t-distribution was used to test the statistical significance of estimated coefficients of the regression models. Since analysis is carried out both at the all India level and at the level of each of the 16 states, the overall conclusions are based on the composite view of regression results at both the levels. However in arriving at the conclusion greater weight was given to the all India regression results.

(4) Chapter Scheme

The study on the pattern of growth of cities in India and the factors that influence the growth rate of cities is organized into the following seven chapters.

Chapter I: Introduction (present chapter)

Chapter II: Economics of City Size and Growth: Review of Literature

In this chapter almost all the relevant studies are reviewed.


In this chapter the pattern of growth of cities in India and 16 major states of India is described and discussed.
Chapter IV: Impact of City Size on City Growth

In this chapter the relationship between city size and city growth in India is analysed.

Chapter V: Functional Specialisation of Cities and its Relationship with City Size and City Growth

In this chapter relationship between size of city and functional specialization of city is analyzed. The impact of functional specialization of city on city growth rate is also discussed.

Chapter VI: Factors Influencing Growth Rates of Cities of India

In this chapter the role of some important factors in growth of city is analysed with the help of multiple regression analysis.

Chapter VII: Summary and Conclusions.