CHAPTER VII

SUMMARY AND CONCLUSIONS

The focus of the present study is on the pattern and determinants of growth of cities in India during the 1991-2001 period. The purpose was to find out the extent and pattern of variation in the growth rate of cities in India and to identify some important factors that are responsible for making different cities grow at different rates. It may be noted that this study is not the usual type of study of growth of urban population in India. A large number of such studies on urbanisation in India already exist. The focus of this study is on the differences in the growth rate of cities in India during 1991-2001 period. Over any period of time cities of a country grow at very different rates, irrespective of the overall rate of growth of urban population. Even when urban population of a country is growing at a fast rate, there are cities in a country that are growing at a slow rate, and there may be some that are stagnant and even declining in terms of population. The people and firms of a country are free to settle in one city or the other depending on their preferences and constraints, and the attractions and distractions of different cities. The cities of a country differ considerably from one another in these attractions and distractions to individuals and firms. On account of that various cities not only attract the new migrants from rural areas at different rates, but also attract people and firms from one another. A considerable shifting of people and firms among cities of a country goes on all the time; that is why all the cities of a country do not grow at the same rate. A considerable variation in the growth rate of cities is always observed in every country. The focus of this study is on this variation in the growth rate of Indian cities during 1991-2001 period. The purpose is to analyse the extent and pattern of variation in the growth of cities in India and to examine the role of some important factors in causing this variation.

In the developed countries, particularly in the United States of America, the analysis of pattern and determinants of growth of cities is quite well
established; the first study on this theme that we could locate in the literature being by Colin Clark (1945). However, in India the issue of pattern and determinants of growth of cities has remained neglected and not even a single study on this theme was found in the literature on urban growth and development. That is what prompted the present study on the pattern of variation and determinants of growth of cities in India during 1991-2001 period.

I. OBJECTIVES OF THE STUDY

The main objectives of the study are the following:

i) To describe and explain the pattern of variation in the growth of cities in India during 1991-2001 period.

ii) To analyse the relationship between city size and city growth rate during 1991-2001 period.

iii) To discern and compare the occupational structure and functional specialisation of cities in India in the early 1990s.

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

v) To analyse the role of some important factors in the growth of cities during 1991-2001 period.

II. DATA AND METHODOLOGY

This study is based on secondary data taken from census of India publications for the years 1991 and 2001. The information on the size of population of each city in 1991 and 2001 is used to compute the growth rate of different cities over this period. The compound growth rate is used for this purpose. The data on classification of city labour force in nine standard industrial categories is used to analyse the functional specialisation of Indian cities in 1991. The 1991-2001 period was selected for empirical investigation because it was the latest decade on which city wise population data were available when the study was started. Moreover, 1990s being the period of liberalised economy the population and firms were almost completely free to decide in which city they
were to settle. The analysis of pattern and determinants of growth of cities is carried out both at the all India level and also state wise for each of the sixteen major states of India. For analysing data tables, growth rates and regression models were used wherever necessary. The results and discussion is organised in chapters II to VI, which are now summarised.

III. CHAPTER WISE SUMMARY

Review of Literature

In chapter II the available literature on the size distribution and growth of cities is reviewed in order to find out the existing evidence and conclusions on the pattern and determinants of growth of cities. Most of the studies explored pertain to the developed countries as not much work on this theme is available for developing countries. Not even a single study on the size distribution and growth of cities in India was found. In most of the reviewed studies the nature of size distribution of cities is analysed; specifically most authors have tried to find out whether the sub-set of larger cities in a country follows the rank-size rule or Zipf's Law. Some studies have also tried to find out the nature of the size of distribution of complete set of cities. Some studies have also tried to directly analyse the role of different factors in the growth of cities. In all forty studies that were available locally in economic journals have been reviewed, the earliest being by Colin Clark (1945) and the latest by Gilles Duranton (2007). A brief summary of each study is presented in the review of literature followed by an overall review of all the studies together to discern the main conclusions that emerge from these studies regarding the size distribution and growth of cities. The review of forty studies on various aspects of economics of city size and growth revealed the following broad conclusions.

i) Majority of the studies indicate that the larger cities of the country, i.e., cities in the upper tail of the city size distribution follow the rank size rule. The rank size rule states that the size distribution of larger cities in a
country is such that the product of city rank and its population size is approximately constant and equal to unity.

ii) The complete distribution of cities in a country, i.e., from the largest to the smallest, follows the lognormal distribution, and not the rank-size rule. The explanation given for this is that city growth rate is independent of city size i.e. bigger and smaller cities grow almost on the same rate, on an average.

iii) In the case of small countries or ex-colonial countries the largest city, which was either a capital town or a port town or both, dominated the size-distribution of cities as it contained a very high proportion of the total urban population of the country.

iv) Many studies have hypothesized that the existence of economies of scale and agglomeration economies lead to fast growth of population of a city. But the diseconomies of scale and negative externalities, such as congestion, crime, pollution etc, slow down the growth of city population. The equilibrium city size is attained where the net benefits from scale economies and agglomeration economies and costs imposed by negative externalities approximate the national average for all the cities.

v) A number of studies have examined the relationship of city size with various economic variables. The empirical evidence indicates that real per capita income, cost of living and crime rate are higher, but unemployment rate is lower in bigger cities than smaller ones. Many researchers have also suggested the existence of economies of scale in the provision of municipal services like water, sanitation, policing, etc, although the optimal level of production is reached at different levels in different services.

vi) Another significant result reported by many authors in their studies is that city growth rate is independent of city size, implying that growth rate of a city is not influenced by the initial size of the city. Even though different cities grow at different rates, but no systematic relation between city size and city growth rate is observed.
Pattern of Growth of Cities in India.

In chapter III, an endeavour is made to describe and analyse the pattern of growth of cities in India during 1991-2001 period. The main features of pattern of growth of cities in developed countries are mentioned briefly to provide the necessary backdrop. The empirical evidence from developed countries suggested the following findings: (i) irrespective of the rate of growth of urban population as a whole, different cities in a country grow at different rates; (ii) the size distribution of cities in a country remains stable over time even though different cities are growing at different rate; and (iii) the growth rate of a city is independent of its size. In India during the 1991-2001 period different cities grew at very different rates; the city growth rate varied from 19.20 percent per year, (being the highest), to (-) 21.80 percent per year, (being the lowest). It was also observed that around one third of the cities grew at about the overall rate of growth of urban population; about one-fifth above that rate; and the remaining about one-half at a rate lower than the overall growth rate of urban population. The results further revealed that on one hand we had 39 cities which grew at a very high rate of 7 percent or above per year, thus doubling or more than doubling their population between 1991-2001; on the other hand population of about 5.71 percent of cities, (i.e. 152 in number), remained stagnant or even declined during these ten years. The 23 metropolitan cities (population 10 lakh or above in 1991) also revealed is diverse pattern of growth rates; ranging from the slowest growing Madurai (1.03 percent per year) to the fastest growing Surat (6.35 percent per year). Thus a great diversity in the growth rate pattern of cities in India in observed during 1991-2001.

The state-wise results, for 16 major states of India, also indicated considerable regional variation in the growth pattern of cities. The state of Assam showed the lowest variation in growth rate distribution of cities (coefficient of variation of city growth rates=35.93 percent), while Kerala displayed the highest variation in the growth rate of cities (coefficient of variation of city growth rates=162.75 percent). Moreover, the four southern states as a group also showed
a higher diversity in growth rate distribution of cities in comparison to the northern states. Even in case of proportion of fast growing cities (growth rate 5 percent or above) significant variation was observed across the states; with Himachal Pradesh having the highest proportion of such cities (12.33 percent) and Tamil Nadu having the lowest proportion of such cities (0.97 percent). Similarly, the proportion of stagnant and declining cities was found to be the highest in Tamil Nadu (15.60 percent) and the lowest in Uttar Pradesh (1.01 percent). Thus, it was concluded that the 16 major states of India differed significantly in terms of pattern of growth rate distribution of cities. No relation between state wise variation in the growth rate distribution of cities and level of development of the state was revealed by regression results. Similarly, no relation between state wise variation in the growth rate distribution of cities and level of urbanization of states was revealed by regression analysis. The pace of urbanisation (i.e. the rate at which overall urban population grew during 1991-2001), however, was found to significantly reduce the variation in the growth rate distribution of cities. The overall conclusion that emerged from analysis of this chapter is that cities in India as a whole, and also in each major state grew at very diverse rates; to be precise the range of variation in city growth rates being from (+) 19.20 percent per year to (-) 21.80 percent per year.

**Impact of city size on city growth**

After exploring the pattern of growth of cities in India, we analysed and assessed the impact of city size on city growth rate in India during 1991-2001 period. Chapter IV, of the study is devoted to this analysis of impact of city size on city growth rate. The most important factor influencing growth rate of city population is supposed to be size of the city; since all other determinants of city growth are correlated with it. The size of the city is expected to impact city growth rate through the association of economies and diseconomies of agglomeration and scale with size of the city. As size of the city increases and becomes bigger numerous agglomeration economies come into motion. The important agglomeration economies are generated by the larger scale of
production and consumption; and through the sharing of inputs by firms and goods by consumers. The bigger size of city also reduces transaction costs in production and consumption and results in reduction in the per unit cost of using lumpy infrastructural assets. Moreover, the bigger size of the city also leads to speeding up the process of innovation through knowledge spillovers and cross fertilisation of ideas among a large and diverse pool of individuals. As a result of these agglomeration and scale economies bigger cities grow faster than smaller cities. However, along with these benefits of agglomeration large size of the city also results in diseconomies and negative externalities. The major negative effects imposed by bigger city size are in terms of rising congestion and pollution costs, greater costs (in terms of money and time) of commuting, higher cost of living, high rent and higher crime rate. A positive relationship between these negative externalities and city size has been indicated by most of the empirical evidence. So, as the size of the city becomes bigger two opposing forces come into action; various agglomeration and scale economies tend to accelerate the expansion of city population, while congesting forces act as barriers on the growth of city population. Therefore, the existing size of a city is the outcome of a complex interaction and balance of these two forces that attract and distract firms, individuals and consumers to a city.

Most of the empirical studies included in the review of literature (Chapter II) suggest that size of the city does not exert any significant influence on growth rate of the city; that is, on an average big and small cities grow at similar rates. Thus implying that size of the city has no significant impact on city growth rate. Even in the case of Indian cities, the analysis of data for 1991-2001 did not suggest any clear significant impact of city size on city growth rate at all India level. The tabular comparison of growth rates of cities of various size groups did not reveal any clear relationship between city size and growth rate of city population. The analysis further revealed that for cities in the population range of 5000 to 10 lakh the growth rate did not differ markedly. However, cities at the two tail ends of city size distribution, that is, small cities with population of less
than 5000 and mega cities with population 10 lakh and above, displayed significantly higher growth rate as compared to cities in the middle of city size distribution. Furthermore, the regression analysis also did not indicate any significant impact of city size on city growth rate at the all India level. The regression coefficient of city size variable, (with city growth rate as the dependent variable) was not significant even at 10 percent level. However, mixed results were observed on city size and city growth rate relationship in the case of 16 major states of India. The regression results revealed a positive impact of city size on city growth rate for only 5 states. So our analysis of 1991-2001 data on Indian cities did not produce very clear and conclusive results on impact of city size on city growth rate. The regression results suggested no relationship between the two, but at the same time there was clear evidence of small and mega cities having grown at a significantly higher rate. The regression analysis in this chapter being univariate it was expected that when we consider city size along with many other determinants of city growth rate, the impact of city size on city growth rate will become more clear.

**Functional Specialization of Indian Cities**

Having examined the impact of city size on city growth rate through regression analysis an attempt has been made in Chapter V to explore and assess the functional specialisation of Indian cities and its relation with city size and city growth during 1991-2001 period. The importance of functional specialisation of cities has been recognised by economists beginning with Colin Clark's study (1945). Two broad categories of cities have been identified, namely, diversified cities and specialised cities. A city that is using its labour force to produce goods and services mainly to cater to the demand of city population itself is known as a diversified city. On the other hand, if a large proportion of particular goods and services produced by city labour force are sold to residents of other cities and even exported to other countries, then it can be called a specialised city. A city may specialise in one, two or more than two economic activities at one and the same time. On the basis of above definition of city specialisation, the functional
specialisation of Indian cities was probed on the basis of 1991 census data that gives the division of labour force of cities into nine industrial categories. The 1991 data were used because the impact of functional specialization of city on city growth rate during 1991-2001 period was to be analyzed. These nine industrial categories were grouped into following five broad economic sectors: (i) Primary; (ii) Industry; (iii) Trade and Commerce; (iv) Transport and Communication; (v) Other Services.

In order to establish the functional specialisation of a city, following two criteria were used: Firstly, if the proportion of workers of a city engaged in an economic activity (out of the above mentioned five) is 40 percent or more then it is deemed to be specialised in that particular economic activity Secondly, if the proportion of workers of a city engaged in each of any two or more than two economic activities is between 30 to 39 percent then it is supposed to be specialised in those two or more economic activities. The application of these two criteria to 1991 data on proportion of labour force of cities in the above mentioned five economic activities revealed that 44.93 percent of Indian cities were specialised in one economic activity by virtue of having 40 percent or more of their labour force engaged in one particular economic activity. The division of city specialisation in accordance with the five economic activities analysed in our study was as follows: 28.10 percent cities specialised in Primary Activities, 8.72 percent cities specialised in Industry, 5.99 percent cities specialised in Other Services, 1.87 percent cities specialised in Trade and Commerce and 0.22 percent cities specialised in Transport and Communication. The results further revealed that 6.51 percent of cities were having dual specialisation with more than 30 percent of their labour force being employed in two economic activities. The remaining 48.56 percent of Indian cities were diversified cities implying that these did not have even 30 percent of their labour force in any one or more than one activity.

In this chapter the relation between functional specialisation of cities and city size was also probed with the help of tabular analysis and regression
technique. The results revealed that city size is positively correlated with proportion of labour force in the following four economic activities: Industry, Trade and Commerce, Transport and Communication and Other Services. The regression coefficient of city size variable for each of these four economic activities was positive and significant at different levels of significance. The results also exhibited a decline in functional specialisation in Primary Activities as city size expands. The regression coefficient of city size variable, (with percent of city labour in Primary Activities, as the dependent variable), was negative and significant at 1 percent level.

Extending the analysis further, an endeavour was made to analyse the impact of functional specialisation of a city on its growth rate with the help of regression analysis in which growth rate of city was the dependent variable and percent of city labour force in an economic activity (out of the five mentioned earlier) as the independent variable. The all India results revealed that as the proportion of city labour in Primary Activities increases the city growth rate declines. On the other hand, regression analysis indicated a significant positive impact of increasing proportion of city labour force in trade and commerce on city growth rate. Even in the case of increasing specialisation in Other Services a similar positive impact was revealed. However, the positive impact of specialisation in Transport and Communication activity did not emerge as clearly as in the earlier mentioned two economic activities. Further, the analysis also revealed the absence of any significant impact of specialisation in Industry on city growth rate. However, results for the 16 major states of India were not as clear as the all India results reported above. Except for the Primary Activities, the state wise results were mixed in the case of each of the other four economic activities. A significant positive impact on city growth was observed in some states, a significant negative impact in other states and no significant impact in many others. For Primary activities a negative significant impact on city growth was observed in 9 states out of 16. Thus, on the basis of combined assessment of all India and state wise results the following conclusions emerged:
(i) The negative impact of specialisation in Primary Activities on city growth is quite clearly revealed by results;

(ii) A positive significant impact of specialisation in Trade and Commerce on city growth is also indicated;

(iii) A positive impact of specialisation in Other Services is also observed, but this result is not as strong as the other two reported economic activities;

(iv) The influence of specialisation in Industry and Transport and Communication on city growth did not emerge clearly in our analysis.

Factors Influencing City Growth

In Chapter VI the analysis is extended further by an attempt to identify some important factors that explain the variation in the growth rate of cities in India during 1991-2001 period. Multiple regression technique was employed for this purpose and the analysis was carried out both at the all India level and also separately for each of the sixteen major states of India. The factors used to explain the variation in growth rate of cities in India were selected on the basis of clues from existing literature and availability of relevant data on Indian cities. The role of following factors in city growth was analysed: initial city size, functional specialisation in Trade and Commerce, functional specialisation in Industry, functional specialisation in Transport and Communication, functional specialisation in Other services, weight of Government Sector in city labour force, road connectivity of the city, and location of the city in Southern India. Due to the complexity in the city size-city growth rate relationship, discovered in Chapter IV, two variables were employed to capture the impact of city size on city growth; namely, population size of city in 1991 and small and mega cities dummy variable that takes value one for small (population less than 5000) and mega (population 10 lakh and above) cities and value zero for all others. The weight of government sector was proxied by a dummy variable that takes value one for district headquarters and state capitals and value zero for other cities; because number of government employees in each city was not easily available in secondary sources.
The road connectivity of a city was indicated by its location on a national highway and that was represented by a dummy variable that takes value one for all cities located on national highways and value zero for all others. Similarly, location of city in southern India was indicated by a dummy variable that takes value one for cities located in four southern states and value zero for all other cities. The southern India dummy variable was used because during 1991-2001 period urban population has grown at a lower than all India rate in three out of the four southern states.

The regression exercise at the all India level, (when all the cities in India were included in the data set) revealed quite clear results. It was found that initial city size has a complex non-linear impact on city growth rate. The small and mega cities grew at a significantly higher rate than others, and an inverse relationship between city size and city growth rate existed among the cities in the middle of the city size distribution. It is worth mentioning that in most of the studies on developed countries, city growth rate was found to be independent of city size, but our analysis revealed a more complex relationship between the two. In case of functional specialization variables, only the impact of specialisation in Trade and Commerce emerged clearly in our results. It was found that increasing specialisation of cities in Trade and Commerce impacts their growth rate positively and significantly. The regression exercise also displayed positive significant impact on city growth rate of two more variables, namely weight of government sector in city and city location on national highway. It was also found that cities located in four southern states grew at a significantly lower rate as compared to cities in northern states. However, the nine explanatory variables included in the multiple regression model generated a very low R-square, thus implying that the growth of cities is influenced by a large number of factors many of which were not included in our model. But still, our regression results can be taken as satisfactory because the influence of a number of factors like city size, city specialization in Trade and Commerce, road connectivity of the city, weight
of government sector in city labour force and location of city in Southern India was very clearly established.

In contrast to the all India results, the state wise regression analysis on determinants of growth of cities did not yield clear results. None of the eight explanatory variables included in the regression model emerged clearly significant in all the states; not even in majority of the states. Rather, the impact of a factor on city growth was positive in some, negative in some other and not significant in most of the states. Thus implying, that at the individual state level none of the determinants of city growth investigated (initial city size, functional specialization of city, weight of government sector and road connectivity) made any significant impact on growth rate of cities. The main reason for this difference between all India and state wise results may be the fact that growth rate of cities in a state also depends on factors operating in other states which attract or distract individuals and firms to cities of that state. As the urban population of different states is much more integrated with each other, (than their rural population), the growth rate of cities in a particular state will depend not only on factors existing within that state, but also on growth rate of cities in other, particularly neighbouring states. This suggests that analysis of determinants of city growth rate is more fruitful and valid at the all India level as compared to individual state level.

Thus, on the basis of analysis of all India data on growth of cities during 1991-2001 period, it may be concluded that the five important factors that impacted city growth rate significantly are: initial size of the city in a non-linear complex way, specialization in Trade and Commerce positively, weight of government sector in city labour force positively, road connectivity of a city positively and location of city in Southern India negatively.

IV. CONCLUSIONS

After the chapter wise summary the main conclusions that emerge from the analysis of pattern of growth and determinants of variations in the growth rate of cities during the 1991-2001 period are given in brief:
(1) The cities of a country always grow at diverse rates; some growing fast, some slow, some stagnating, and some even declining.

(2) In spite of great variation in the growth rate of cities, the overall size distribution of cities in a country remains stable and follows the log-normal distribution for the complete set of cities, and rank-size rule for the sub-set of larger cities.

(3) The complex interaction of agglomeration and scale economies and congestion costs and negative externalities produced by expansion of city population determines the rate of growth of city population during any period.

(4) In the developed countries, most evidence indicates that growth rate of cities is independent of city size, i.e., the bigger and smaller cities grow at similar rates, on an average.

(5) During 1991-2001 period cities in India grew at diverse rates; the range of variation in city growth rates being from (+) 19.20 percent per year to (-) 21.80 percent per year. The very fast growing cities that doubled or more than doubled in population in these 10 years coexisted with completely stagnant or even declining cities.

(6) During 1991-2001 period, 44.93 percent of Indian cities were functionally specialized in one economic activity with 40 percent or more of their labour force engaged in one economic activity. Another 6.51 percent of Indian cities were specialised in two economic activities with 30 or more of their labour force engaged in each of the two economic activities. The remaining 48.56 percent of Indian cities were diversified cities.

(7) The functional specialisation of cities in India was positively related with city size in the case of the following four broad economic activities; (i) Trade and Commerce; (ii) Industry; (iii) Transport and
communication; and (iv) Other Services. The relationship between city size and functional specialisation in Primary economic activity was negative.

(8) The impact of city size on city growth rate in India during 1991-2001 period was significant, but complex. The small and mega cities grew at a significantly higher rate than cities in the middle of the city size distribution; and in the middle of city size distribution city growth rate-city size relationship was negative significant, i.e. bigger, cities grew at lower rate than smaller cities.

(9) In addition to city size the following other factors significantly impacted city growth rate in India during the 1991-2001 period.

(i) Functional specialization of city in Trade and commerce impacted city growth rate positively.

(ii) Higher weight of Government sector in city labour force impacted city growth rate positively.

(iii) Connectivity of city with a national highway impacted city growth rate positively.

(iv) The location of city in the four southern states impacted city growth rate negatively.