The main objectives of the study were (1) to examine the regional pattern of growth and disparities in manufacturing in India over the period 1960-61 to 87-88, (2) to analyse the factors responsible for the high rate of growth of industrial output at all-India level over the period 1976-77 to 87-88, (3) to analyse the regional pattern of growth of aggregate organized manufacturing industries in India over the period 1976-77 to 87-88, (4) to examine the regional pattern of growth of agro-based industries, petrochemical and mineral-based industries and metal-based industries in India over the period 1976-77 to 87-88, (5) to examine the factors responsible for the observed differential rates of growth of organized manufacturing at aggregate and disaggregate levels in various states.

The study is based on the data available from the secondary sources of informations. The study is based on time series data. Both the time series and the cross section analyses were carried out at appropriate contexts.

In the analysis of regional pattern of growth and disparities, the time series data covers the period 1960-61 to 87-88. The analysis of the factors responsible for the improved growth performance of manufacturing at all-India level is confined to the time series data for the period 1976-77 to 87-88. The analysis of nature and pattern of
growth of organized manufacturing, agro-based, petro-chemical and mineral-based and metal-based industries are confined to the period 1976-77 to 87-88. This is done depending on the availability of data. The industrial sector includes three sub-sectors, namely, (a) manufacturing, (b) mining and quarrying and (c) electricity, gas and water supply. The manufacturing sector is composed of (a) the factory sector and (b) the non-factory sector.

The main source of data for the study is the Annual Survey of Industries. The study has confined to an analysis of organized manufacturing industries. This is also called the registered manufacturing or the factory sector. The factory sector is composed of (a) census sector and (b) sample sector. The census sector covers all registered firms employing 50 or more workers with the aid of power or 100 or more workers without the aid of power. The sample sector cover all units employing 10 to 49 workers if using power or 20 to 99 workers, if not using power. It has not been possible to undertake an analysis of the unorganized manufacturing or unregistered sector or all the manufacturing enterprises which are not registered under the Indian Factories Act of 1948. The non-factory sector covers all the units employing less than 10 workers if using power or less than 20 workers if not using power. It includes household enterprises and small-scale non-household enterprises.

The present study has not included the unorganized manufacturing because there is no detailed informations
available on the unorganized manufacturing. The only information available on the unorganized manufacturing sector in aggregate is the net value added estimated by CSO in Estimates of State Domestic Product. On the other hand, the Annual Survey of Industries published by CSO gives detailed industry-wise informations.

The exclusion of unorganized manufacturing sector from the analysis constitutes an important, but inevitable limitation of this study. Some of the important findings as elaborated earlier are briefly summarised below.

In terms of practically all conceivable economic indices, India has performed remarkably better in the period before independence, including the entire period of British rule from the 18th century.

India was one of the pioneers of third world industrialization. The rate of growth of Indian industry, 10.4 per cent per annum, during the latter part of the 19th century (1868-1900) has not been bettered since.

There are three distinct periods in the history of industrial growth in India since independence. During 1954-55 to 65-66, the industrial production increased at an average annual rate of 7.1 per cent. The growth rate fell sharply to 3.9 per cent per annum during 1964-65 to 74-75. During the period 1976-77 to 87-88, the industrial output grew at 6.5 per cent per annum.

The impressive performance of industrial output in the
period 1950-65 can be explained because of the operation of the following factors:

1. Large doses of public investment in infrastructure and intermediate and heavy industries.

2. An ever increasing level of public expenditure.

3. The policy of import substitution implemented through the protection gave stimulus to the industrial development.

During 1950-51 to 1964-65, the industrial output grew at 7.00 per cent per annum. However, the rate of growth decelerated to 3.6 per cent per annum during 1964-65 to 74-75. The factors responsible for the industrial deceleration are: 1) the wars of 1962, 1965 and 1971 which diverted potential public investment into unproductive uses, 2) the successive droughts of 1965-66 to 66-67 and later 1971-72 to 72-73 which restricted the supply of raw materials and the demand for industrial growth from the agricultural sector, 3) deceleration in the rate of growth of agriculture, 4) ever worsening income distribution. 5) fall in the rate of growth of total factor productivity, 6) decline in the public investment, 7) exhaustion of domestic market consequent upon the import substitution, 8) the complex bureaucratic system of licensing, restrictions and controls. The cumulative effect of all the policies became an obstacle to growth.
The rate of growth of industrial output in India improved since 1975-76. During the period 1976-77 to 87-88, India secured 6.5 per cent annual compound rate of growth in the industrial output. The study has shown that the following factors were operated in the achievement of high growth rate of industrial output at the national level over the period 1976-77 to 87-88.

The satisfactory growth performance of foodgrains production. The production of foodgrains grew at a compound rate of 2.44 per cent per annum over the period 1976-77 to 87-88 at the national level.

- Marketed surplus of foodgrains also increased.
- Net per capita availability of foodgrains also have gone up. The foodgrains terms of trade moved in favour of industry.
- Increase in the rate of growth of agricultural production gave rise to an increasing rural non-food consumption expenditure.
- Fall in the foodgrains terms of trade also gave fillip to urban non-food consumption expenditure.
- Increase in the income originating in the non-agricultural sector caused rise in the urban non-food consumption expenditure.
- Increase in the national income caused the increase in the savings of the public sector.
- Decline in the foodgrains terms of trade also stimulated the savings of the public sector.
The savings of the household sector went up with the rise in the national income.

The gross capital formation in the private corporate sector has also moved up with the rise in the national income.

The fall in the terms of trade also caused the rise in the gross capital formation in the private corporate sector.

The study has also observed that the national income growth is more responsive to the growth of industrial production. The growth of basic and capital goods industrial output was mainly responsible for the observed high rate of growth of industrial output. It has also found that high rate of growth of industrial production as well as the agricultural production lagged by one year influenced the consumer goods industrial output positively. Similarly, the movement of the foodgrains terms of trade in favour manufacturing also gave fillip to the consumer goods industrial output.

Increase in the net availability of foodgrains production has caused the movement of foodgrains terms of trade downward. Increase in the growth of consumer goods industrial output affected the foodgrains terms of trade positively. But this influence was not very important because the sign of the influence the index of industrial production lagged by one year on the foodgrains terms of trade is
negative. This indicates that the rise in the index of industrial output lagged by one year has not inflated the foodgrains terms of trade.

The index of non-foodgrains terms of trade in the year \( t \) is negatively influenced by the production of non-foodgrains as well as the importation of crude materials. As the production of non-foodgrains and the importation of crude materials increased, the index of non-foodgrains terms of trade declined. But the influence of the rise in the index of consumer goods industrial output on the index of non-food grains terms of trade was positive.

The gross capital formation in the household sector went up with the rise in the national income of the previous year. The gross capital formation in the private corporate sector was highly influenced by the rise in the national income. The fall in the terms of trade had a positive effect on the gross capital formation in the corporate sector.

Another explanation for the improved growth performance of the industrial sector in India is the improvement in the rate of growth of total factor productivity. At all India level the translog index of total factor productivity grew at 1 per cent per annum over the period 1976-77 to 87-88 in the organized manufacturing. Most of the organized manufacturing industries recorded high rate of growth in the total factor productivity during the period. The improvement in the performance of industry during the period 1976-77 to 87-88 is
mainly because of the effect of bringing about the measure of deregulation and debureaucratization in Indian industry. The main elements of change are confined to delicensing of certain industries, reducing the degree of deregulation for many others, greater scope to larger private industrial houses to participate in the process of industrialization.

The ability to maintain a high growth of real public investment in infrastructure seems to be essential as a growth promoting force. About 8 per cent annual rate of growth of industrial output during 1950-51 to 64-65 was partly on account of large investments in infrastructure. The investment in infrastructure grew at 15 per cent per annum during 1960-61 to 65-66. But this rate of growth drastically declined to 2.1 per cent per annum during 1965-66 to 75-77. The industrial output grew at 6.5 per cent per annum during 1976-77 to 87-88 though the rate further went up after 1987-88. This achievement was partly because of the increase in infrastructural investment. The gross investment in infrastructure increased at 10.60 per cent per annum during 1976-77 to 87-88. The share of the public sector investment in infrastructure rose from 28.98 per cent in 1960-61 to 40.39 per cent in 1970-71 which declined to 31.93 per cent in 1975-76 which further went up to 53.70 per cent in 1987-88.

The study has examined the nature of regional disparities in India over the period 1960-61 to 87-88. In 1960-61, the state Punjab, Maharashtra, West Bengal, Gujarat, and Haryana occupied the place of pride in real per capita
state domestic product and continued the top ranks in later years. Similarly, the states of Bihar, Orissa, Madhya Pradesh, Uttar Pradesh, Assam and Kerala remained at the bottom layer in terms of real per capita state domestic product. These states continued to hold the bottom ranks in the later years. The state of West Bengal and Rajasthan seem to lose their relative status over time with reverse happening to Haryana, Karnataka and Uttar Pradesh. But, barring these exceptions, there appears to be a remarkable stability in the relative position over time.

The state relatives of per capita net domestic product for 1960-61 and 1987-88 give a clear indication of divergence of inter-state-disparities. The proportion of income generated in the primary sector had a negative impact on the per capita income growth. Similarly, one finds that the proportion of income generated in the secondary sector has a positive impact on the per capita income across the states.

The state product inequalities have risen throughout the period 1960-61 to 87-88. This rising trend in the per capita state product inequality has been on account of the primary as well as the tertiary sectors. Inequality in the per capita originating in the secondary sector has been on the decline. This is mainly because of the increasing dispersal of organized manufacturing industries.

The state relatives of per capita originating in the registered manufacturing show the convergence of the inter-state disparities over the period 1960-61 to 87-88. The
declining inter-state disparities in per capita originating in the organized manufacturing has also been confirmed by the time trends in coefficient of variation.

The value added and the output originating in the organized manufacturing grew at 6.41 and 6.00 per cent per annum respectively over the period 1976-77 to 87-88 at all-India level. The rates of growth of value added as well as the output of organized manufacturing exceeded the national average in the states of Madhya Pradesh, Andhra Pradesh, Punjab, Haryana, Rajasthan, Tamil Nadu, Gujarat and Karnataka. The rates of growth of both the value added and the output of aggregate organized manufacturing fell short of the all-India average in the states of Kerala, Bihar, Assam, Orissa, and West Bengal. It was little below the national average in the state of Maharashtra during the same period.

The states of Assam, Bihar, Kerala, Orissa and Rajasthan remained industrially backward. Among the industrially backward, only the state of Rajasthan could achieve high rate of growth in value added in aggregate organized manufacturing. The industrially developing states of Andhra Pradesh, Uttar Pradesh and Madhya Pradesh also could achieve high rates of growth in the Value added in aggregate organized manufacturing. Similarly, most of the industrially advanced states were also able to achieve high rates of growth.
A study of disaggregative growth performance enable one to comprehend which industrial groups are emerging by which some states could achieve very high growth rates and one can ask why other states could not compete with the states which acquired high growth rates over the period 1976-77 to 87-88.

It is notable that all the three groups of industries, agro-based, petro-chemical and mineral-based and metal-based, recorded high rates of growth in value added in the states of Andhra Pradesh, Karnataka, Tamil Nadu, Haryana, Rajasthan and Uttar Pradesh. In the state of Punjab, though the metal-based group of industries recorded a low rate of growth, other two groups of industries acquired very high growth rates. In the states of Gujarat, Madhya Pradesh and Maharashtra, the petro-chemical and mineral-based and metal-based groups of industries recorded very high growth rates. All the groups of industries generally recorded very low rates of growth in the states of Assam, Orissa and West Bengal. The petro-chemical and mineral-based group of industries in the states of Kerala and Bihar also acquired high rates of growth.

The low rates of growth of aggregate organized manufacturing in the state of Kerala is caused by the agro-based as well as the metal-based groups of industries. In the states of Orissa and Bihar, the metal-based group of industries recorded low rates of growth. In the state of Assam, the growth rate of agro-based industries, is responsible for the poor performance of organized
manufacturing. In the state of West Bengal, all the three groups of industries, generally recorded low rates of growth.

The differential rates of growth in value added or output and employment recorded in the aggregate organized manufacturing require some explanations. The following propositions were tested. 1) diversification is a necessary condition for high growth of output in aggregate organized manufacturing, 2) spatial variations in the rates of growth of labour productivity lead to differential rates of growth of output in manufacturing., 3) Wage-cast is an important determinant of the manufacturing growth., 4) The relationship between the per worker wages and the per worker productivity is important. 5) The productivity per head and the capital-labour ratio are positively correlated. 6) Capital productivity has a significant role to play in the determination of growth rates, 7. The presence of economies or diseconomies of scale cause the manufacturing to grow at different rates in various regions, 8. Improvement in the total factor productivity leads to high rates of growth, 9. The performance of manufacturing also depends on the performance of agriculture, 9. The growth of manufacturing in a region depends on the nature of infrastructural development, 10. The nature of industrial disputes play a major role in the differential rates of growth of manufacturing in various states.
The study has examined a number of alternative hypotheses for the regional variations in the rates of growth of value added or output in aggregate and disaggregate organized manufacturing industries in India over the period 1976-77 to 1987-88.

Firstly, the study has examined the proposition that the industrial diversification is a necessary condition for high rate of growth of value added originating in aggregate organized manufacturing.

The study could find a statistically significant negative rank correlation between the rates of growth of value added in aggregate organized manufacturing over the period 1976-77 to 1987-88 and the coefficients of specialization for 1976-77 and 1987-88. On the basis of this evidence, the study accepts the hypothesis that the industrially more diversified regions secure high rates of growth in value added or output in aggregate organized manufacturing than the regions which are comparatively less diversified.

Another proposition related to the spatial variations in the rates of growth of value added originating in organized manufacturing industries is related to the rates of growth of labour productivity.

This proposition is examined by regressing the rates of growth of value added over the period 1976-77 to 1987-88 across the states on the rates of growth of labour productivity over
the same period. The proposition got validated in case of aggregate organized manufacturing. The rates of growth of labour productivity as an independent variable failed to explain the regional variations in the rates of growth of value added originating in the aggregate agro-based industries. Same trend has been observed in the case of individual agro-based industries except cotton textiles and beverage industries. The study accepts the argument that the spatial variations in the rates of growth of value added in cotton textiles and beverage industries were on account of the spatial variations in the rates of growth of labour productivity.

The study has shown adequate evidence for not rejecting the argument that the spatial variations in the rates of growth of value added originating in aggregate petro-chemical and mineral based industries depend on the rates of growth of labour productivity. This has been found true in chemical and chemical product industries. The study has also shown that the regional variations in the rates of growth of labour productivity was a significant factor explaining the variations in the rates of growth of value added in aggregate as well as the individual metal-based industries except machinery and machine tools.

The existence of Verdoon’s law is not observed in the aggregate organized manufacturing as well as the aggregate agro-based industries over the period 1976-77 to 87-88.
However, it has been observed in beverage, cotton and wool industries. It has been found in aggregate petro-chemical and mineral-based and metal-based industries.

The study has also examined whether the wage cost is an important factor affecting the rate of growth of value added originating in organized manufacturing industries in a region.

In the case of aggregate organized manufacturing, statistically significant negative rank correlation between the per worker real wages and the rates of growth of value added over the period 1976-77 to 87-88 are observed.

In aggregate agro-based industries, the study does not get a statistically significant evidence for accepting the argument that the states which are having the low share of wages in value added or low per worker wages recorded high rates of growth of value added. However, statistically significant negative rank correlation between the rates of growth of value added over the period 1976-77 to 87-88 and the share of wages in value added are observed for 1987-88 in food, cotton and wood industries. The study has found a statistically significant negative rank correlation between the rates of growth of value added and the per worker real wages across the states in cotton textiles, beverages, textile products and wood industries.

In aggregate petro-chemical and mineral-based industries, the study could find a significant evidence for
not rejecting the argument that the rates of growth of value added depend on the per worker real wages. This is found true in rubber, plastic, petroleum and coal products. In non-metallic mineral product industries, significant negative rank correlation between the rates of growth of value added and the share of wages for 1987-88 are observed.

In aggregate metal-based industries, statistically significant negative rank correlation between the rates of growth of value added over the period 1976-77 to 87-88 and the share of wages in value added is observed. Statistically significant rank correlation coefficients are also observed in all the individual metal-based industries except metal products and parts for 1987-88. Alternatively, this proposition has been examined with the rank correlation between the rates of growth of value added and the per worker real wages which also support the argument. This is also observed in individual metal-based industries except metal products and parts and machinery and machine tools for 1987-88. On the basis of this evidence, one could argue that the states which recorded high rates of growth in value added in metal-based industries had comparatively low per worker real wages or low share of wages in value added.

The study has also examined how the per worker wages and the per worker productivity are associated. The regression results with the level of per worker wages as a function of the per worker productivity across the states for 1976-77 and 1987-88 do not show the trend of divergence. But
the low explanatory power of the regression equation estimated with the rates of growth of per wages as a function of the rates of growth of labour productivity indicates that the relationship is not statistically significant.

The study shows a statistically significant association between the per worker productivity and the per worker wages in the aggregate as well as individual agro-based industries except beverage and wood industries for 1976-77. For 1987-88, the per worker productivity appeared to be an insignificant factor in explaining variation in the per worker wages in cotton textiles and wood industries. The rates of growth of labour productivity is not able to explain much in the rates of growth of per worker real wages in beverages, cotton textiles, textile products, wood and paper industries. These results indicate that there were states where the per worker wages and the per worker productivity diverged to a great extent in individual agro-based industries.

The study has found a close association between the per worker wages and productivity across the states in aggregate as well as the individual petro-chemical and mineral-based industries.

In aggregate metal-based industries, the rank correlation results show that wage per worker is closely related with productivity per worker. The regression results also show similar results for both 1976-77 and 1987-88.
However, the third set of regression results in which the rates of growth of per worker real wages over the period 1976-77 to 87-88 are considered as a function of the rates of growth of per worker real productivity across the states, clearly show that the rates of growth of per worker productivity failed to explain significantly the variations in the rates of growth of per worker real wages in aggregate as well as individual metal-based industries. This indicates that the rates of growth of per worker real wages diverged to a great extent from the per worker real productivity.

Fifthly, the study has examined the proposition that the rate of growth of capital productivity has a significant role to play in the determination of manufacturing growth in a region.

The results indicate that the proposition is validated in aggregate organized manufacturing.

The study has examined the relationship between the presence of economies of scale and the rates of growth of value added in organized manufacturing industries over the period 1976-77 to 87-88 in different states by looking at their time series data.

It is found that statistically significant economies of scale in aggregate organized manufacturing are found only in two states namely, Haryana and Punjab. In all other states, the relationship is not validated. The existence of
economies of scale are not observed in the aggregate agro-based industries in any of the states. However, the individual agro-based industries in some of the states indicate the existence of economies of scale. Food products (Madhya Pradesh); Beverages (Kerala and Tamil Nadu); Wool (Punjab); Textile Products (Gujarat and Tamil Nadu); and Leather and Fur Products (Maharashtra and Uttar Pradesh).

The presence of statistically significant economies of scale coefficients are observed in the aggregate petrochemical and mineral-based industries in the states of Haryana, Karnataka, Kerala and Punjab. In the case of rubber, plastic, petroleum and coal products, the economies of scale are observed in the States of Punjab and West Bengal. In chemical and chemical products, the economies of scale existed in Punjab. In non-metallic mineral products, it existed only in Tamil Nadu.

The presence of economies of scale in aggregate metal-based industries are observed in the State of Uttar Pradesh. Basic metal and alloy industries show the presence of economies of scale in the States of Haryana and West Bengal. In the case of metal products, it is observed in the States of Andhra Pradesh, Haryana, Punjab, Uttar Pradesh and West Bengal. In machinery and machine tools, it existed in the States of Andhra Pradesh, Haryana, Karnataka, Maharashtra, Punjab and Uttar Pradesh. In electrical machinery and machine tools, economies of scale are observed in the states of Haryana, Karnataka, Maharashtra, Punjab, Rajasthan, Tamil
Nadu and Uttar Pradesh. In transport equipment, it existed only in the State of Rajasthan.

The study has examined the proposition that the high rate of growth of TFP in a region causes the value added to grow at high rate.

The rates of growth of value added originating in aggregate organized manufacturing over the period 1976-77 to 87-88 in various states are regressed on the rates of growth of TFP over the same period. The study finds that the regional variations in the rates of growth of value added are explained by the spatial variations in the rates of growth of total factor productivity.

The study also shows the evidence for accepting the argument that the rates of growth of value added in aggregate agro-based industries depend on the rates of growth of total factor productivity. This is found true in food products, cotton textiles, wood, leather and fur and fur and beverage industries. It fails to explain the same in textile products, wool and paper industries.

The study enables one to accept the argument that the rates of growth of value added in various regions depend on the rates of growth of total factor productivity in rubber, plastic, petroleum and coal products and non-metallic mineral products. However, the study does not show any evidence on the spatial variations in the rates of growth of total factor productivity as an explanation for the differential rates of
growth of value added in aggregate petro-chemical and mineral-based industries as well as chemical industries.

The spatial variations in the rates of growth of TFP as an explanation for the regional variation in the rates of growth of value added in aggregate as well as individual metal-based industries except basic metal and alloy industries are found true over the period 1976-77 to 87-88.

Eighthly, the study has examined the proposition that the performance of manufacturing in a region depends on the performance of agriculture.

The argument that the rates of growth of value added originating in aggregate organized manufacturing in various states depend on the rates of growth of agriculture has not been validated.

The study does not show any statistically significant relationship between the rates of growth of value added originating in agriculture and the value added originating in agro-based industries across the states over the period 1976-77 to 87-88. Similarly, the study could not find a statistically significant relationship between the rates of growth of value added in cotton textile industry and the production of cotton lint across the states over the period 1976-77 to 87-88.

Ninthly, the study has examined the relationship between the rates of growth of value added in aggregate
organized manufacturing and the nature of infrastructure in various states.

The study finds that the regional variations in the infrastructural development provides a statistically significant explanation for the observed differential rates of growth of value added originating in the aggregate organized manufacturing in various states.

Finally, the study has also examined the proposition that the extent of industrial disputes in various states also cause the value added in manufacturing to grow at different rates.

The study has clearly brought out that the differential rates of growth of value added originating in various states were influenced by magnitudes of industrial disputes as expressed in number of man-days lost.

In the end, with the help of a multiple regression analysis, the study has shown that the regional variations in the rates of growth of total factor productivity and the levels of infrastructural development were the two main important factors explaining the spatial variations in the rates of growth of value added originating in the aggregate organized manufacturing over the period 1976-77 to 87-88.

The study has also tried to capture the major determinants of employment growth in organized manufacturing in various states over the period 1976-77 to 87-88. This has
been done by estimating the demand for labour functions. The results indicate that the spatial variations in the rates of growth of employment in aggregate organized manufacturing was mainly because of the spatial variations in the rates of growth of value added. However, the capital intensity and per worker real wages did not show a statistically significant relationship with the rates of growth of employment.

It is also found that the rates of growth of value added was the major determinant of the rates of growth of employment in aggregate agro-based industries except wood products. On the other hand, in aggregate agro-based industries, the rates of growth of per worker real wages affect the rates of growth of employment negatively. Statistically significant negative effects of rates of growth of per worker real wages on the rates of growth of employment is observed in food, beverages, cotton textiles and paper industries.

The estimated demand for labour functions in aggregate as well as individual petro-chemical and mineral based industries except non-metallic mineral products industries indicate that the rates of growth of value added was the main determinant of the growth of employment. In non-metallic mineral products industries, the significant negative effect of capital intensity and per worker wages are observed.

It is also observed that the rates of growth of value added was the main determinant of the rates of growth of
employment in aggregate as well as the individual metal based industries except metal products. Significant negative effect of rise in capital intensity on employment has also been observed in basic metal, electrical and transport industries.